(1) Submission ID#477838

Case stuty double stenting of oesophagus and airway in palliative treatment of patient with oesophageal cancer

Submission Type: Case Report
Submission Status: Complete
Submitter: Giap Vu – Woolcock Institute of Medical Research- The University of Sydney

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Esophagology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Advances oesophageal cancer often force bronchotracheal resulted narrow airway when the tumor increases its size, with invasive the back wall of trachea. Patients feel difficulty breathing, reduce quality of life. Double stenting of oesophagus and airway in palliative treatment is a good choice

Case Report

A 54y male patient, with oesophageal cancer (T4N3M1) type squamous cell about 9 months, treated by radiation chemistry therapy. He admitted to Bach Mai hospital because shortness of breath, dry cough, dysphagia and without lose weight. Physical examination revealed wheezing in both side of lung, BMI: 17.5, and no lymph node. A computed tomography of thorax showed a tumor of esophagus located after tracheal, caused severe narrow tracheal, with the narrowest size was 3 mm (Fig.A). Flexible bronchoscopy showed a tumor from outside protrudes caused narrow about 80% area of tracheal. The patient would be performed a rigid bronchoscopy to placed a dynamic Y stent after that. But, we failed when tried intubation with hard tube. He was performed tracheostomy, and then placed a dynamic Y stent through tracheostomy. Oesophageal stenting was performed after 6 days, using a flexible endoscope. The stents position was checked endoscopically. With double stent in airway and oesophageal, the symptoms of patient were reduced and increase quality of life.

Conclusion

Stenting in airway and oesopheal in patient with esophageal cancer is palliative treatments which efficient. But this treatment should be reserved to very selected patients in end-stage disease. In the case patient could not be intubation with hard tube, push stent after tracheostomy is another alternative which may be consider.

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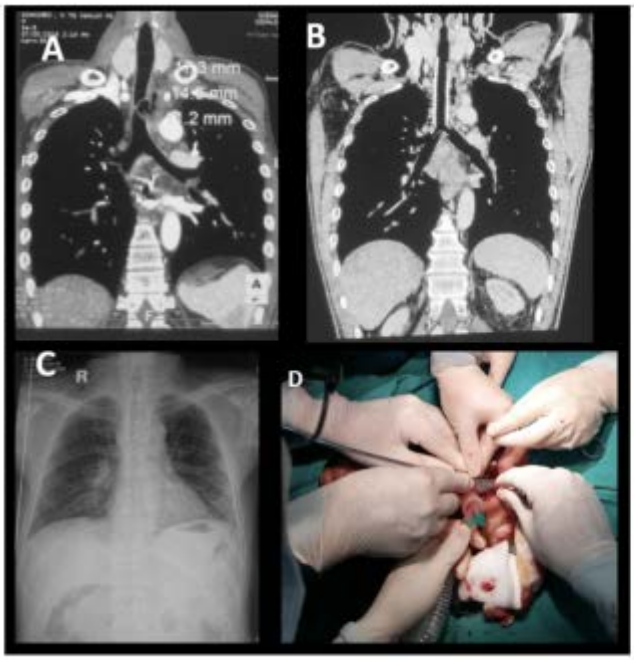

Figure: A: The tumor causes narrow tracheal.

B: Tracheal after pushed a dynamic stent.

C. Double stenting of eosophagus and airway.

D. Push the stent through tracheostomy.

(2) Submission ID#454835

High Resolution Manofluorographic Study in Patients with Multiple System Atrophy: Possible Early Detection of Upper Esophageal Sphincter and Proximal Esophageal Abnormality

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Rumi Ueha – Department of Otolaryngology, the University of Tokyo

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Esophagology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Multiple system atrophy (MSA) has detrimental effects on swallowing function, such as impairment of upper esophageal sphincter (UES) opening. Swallowing dysfunction in patients with MSA deteriorates with the progression of the disease and considerably reduces quality of life. The swallowing function of persons with MSA, however, has not been systematically characterized and the underlying pathophysiological mechanisms of dysphagia remain poorly understood. The aim of this study was to investigate the characteristics of swallow function in MSA using high-resolution manofluorography (HRMF).

Methods
We performed a retrospective review of twenty-five patients with MSA who underwent HRMF at the University of Tokyo Hospital from 2016 to 2017. HRMF was performed only on patients with only oral diet. HRMF were performed on patients with protocol of 3 wet swallows of 5 cc thickened contrast agent in upright position. Normal values of HRMF were defined as UES relaxation duration: 0.45s, UES relaxation residual pressure: 12 mmHg, UES resting pressure > 34 and < 104 mmHg. The frequency of abnormal proximal esophageal contraction during swallowing (from the initiation of swallowing to the end of UES relaxation), deficient UES relaxation duration, UES abnormalities, and the sub-type of UES abnormality present (hypotensive, hypertensive, or impaired relaxation) were evaluated.

Results

The ages of the patient cohort ranged from 48-81 years (median 65 years). Sixty eight percent was male. A pattern of abnormal hypertensive and discoordinated proximal esophageal contraction during swallowing was observed in 14 patients (56%). Deficient UES relaxation duration, impaired UES relaxation, hypertensive resting UES pressure and hypotensive resting UES pressure were detected in 8 patients (32%), 3 patients (12%), 1 patient (4%), 11 patients (44%) respectively.

Conclusions
Swallowing dysfunction is common in patients with MSA. Abnormal UES resting pressure is frequently encountered and a discoordinated proximal esophageal pressure response is common and may be a manometric finding pathognomonic for MSA. These abnormal findings suggest that neuromuscular dysfunction of the UES and proximal esophagus during swallowing and rest may occur even in the MSA patients with mild/moderate dysphagia and oral intake status. Further research is necessary to confirm whether this finding is diagnostic of the early stage of swallowing dysfunction in patients with MSA.

(3) Submission ID#476605

Successful use of Argon Plasma Coagulation in treatment of recurrent endobronchial lipomas.

Submission Type: Case Report
Submission Status: Complete
Submitter: Hanine Inaty – Cleveland Clinic

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Pulmonary lipomas are very rare and account for 0.01% of airway tumors. They are almost always endobronchial in origin as they arise from submucosal airway fat of the main and lobar bronchi. Definitive therapy is resection, however, given usual location in the first three subdivisions of the tracheobronchial tree, they are often amenable to bronchoscopic interventions. Herein, we describe a case of multiple endobronchial lipomas successfully treated with argon plasma coagulation (APC).

Case Report
A 34 years old gentleman, with a history of cardiac and mediastinal lipomas, previously treated with resection and cardiac reconstructive surgery, presented to our pulmonary clinic with chronic cough and shortness of

breath. Computed tomography of the chest revealed multiple endobronchial lesions. Bronchoscopy confirmed the presence of multiple large and partially obstructive endobronchial tumors in the trachea, right main stem bronchus and bronchus intermedius. (Fig1) Electrocautery snare was used to remove the largest polypoid lesion from the upper trachea, followed by application of APC at the base through the flexible bronchoscope. Additional smaller airway lesions were also treated with APC with significant improvement in airway lumen and thus patients symptoms. Histopathology confirmed the diagnosis of benign airway lipomas. Repeated bronchoscopies performed at 1 month followed by 2 and 3 months intervals, showed significant progressive improvement in tumor burden with minimal recurrence at previously treated sites (Fig1).

Conclusion

APC uses an electrically conductive argon plasma to deliver a high-frequency current via a flexible probe without direct contact with the tissue. It is considered safe and permits rapid coagulation with limited penetration of the beam into the airway wall. The success of APC in the management of endobronchial lipomas is likely related to their superficial nature, their large fat content and their poor blood supply, leading to greater electrical resistance and thus more thermal energy generated at the site for a given amount of current. Thus we conclude that, when feasible, bronchoscopic therapy should be first choice in management of endobronchial lipomas and APC can be curative.

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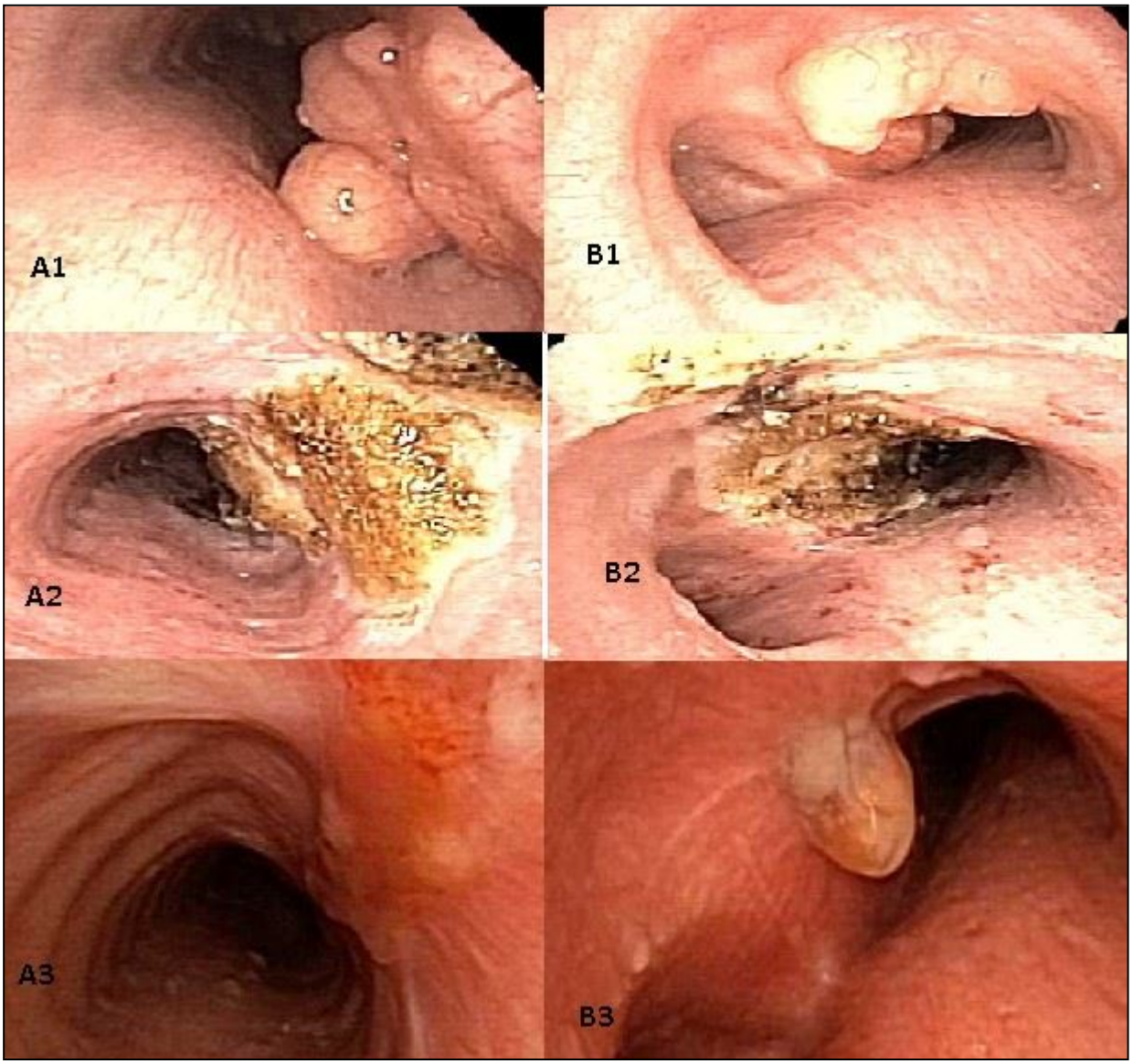
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(4) Submission ID#478034

3D printing template guided iodine 125 seed implantation for the treatment of trachea stenosis causing by Thyroid cancer Compression

Submission Type: Case Report

Submission Status: Complete

Submitter: Zhanglin Liu – The First Affiliated Hospital of Nanchang University, nanchang, jiangxi,P.R.China

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Tracheal stent can relieve the dyspnea in short time and is an effective treatment of tracheal stenosis. However, malignant tracheal is prone to recur after the treatment.Radioactive seed implantation may have good effects.It can destroy the tumor by continuous rays to relieve the dyspnea.

Thyroid cancer is an uncommon type of cancer. Most people who have it do very well, because the cancer is usually found early and the treatments work well. After it is treated, thyroid cancer may come back, sometimes many years after treatment.

Case Report

A 73-year-old female,diagnosed with thyroid cancer,received surgical treatment in 2009.3 years later,the cancer recurred and she received another surgical treatment. The patient was treated with tracheal stent for dyspnea in 2014.Upon disease progression,he received radioactive seed implantation in 2016.In November

2017,he suffered dyspnea again and received secondary radioactive seed implantation.The dyspnea gradually disappeared for follow-up of 1 month.

Conclusion

Radioactive seed implantation is a new therapy which can destroy the tumor by continuous rays,the effect of the therapy is not only to improve the symptoms, but also to treat the disease and increase long-term survival rate.

(5) Submission ID#477063

A case of emergency treatment of critical asthma by bedside bronchial thermoplasty

Submission Type: Case Report

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Director of Respiratory Diseases Center of Shenzhen Guangming New District Medical Group, Society for Advanced Bronchoscopy committee,member of the intervention Committee of the Chinese Association of Respiratory Physicians.

Case Report

The patient, male, 30 years old, was admitted to hospital on March 23, 2017 due to "Recurrent asthma for more than 6 years and aggravated dyspnea for 1 day." The patients asthma was significantly worsened after a cold 1 days ago.accompanying respiratory difficulty. The patient self-inhaled "salbutamol aerosol" several times, symptoms are not alleviated. Admitted to hospital for "severe asthma".SO2: 83%.Severe dyspnea.Pulmonary function (2017-03-17): Prompt severe mixed ventilation dysfunction, ACT 9 points, ACQ 6.5 points. 2017-03-23 Auxiliary examination after admission: Arterial blood gas: pH: 7.137, PCO2: 74.7 mmHg, PO2: 95.0 mmHg, SO2: 94.0%, FiO2: 41.0%. Initial diagnosis: 1. Acute exacerbation of bronchial asthma (extremely critical); 2. Type II respiratory failure Respiratory acidosis.After admission, After rescue and treatment. The patient's condition did not improve, further worsened. Confusion appeared, blood oxygen saturation dropped to 82%. Intubation through the bed, ventilator assisted ventilation, oxygen saturation rose to 94%. On March 24th, 2017, approved the protocol. Under the ventilator-assisted ventilation, BT was performed at the bedside by bronchoscopy at 15:00. During the operation, the bronchial mucosa was swollen, the lumen became narrow, and the secretions were numerous. Asthma beads can be seen. Preoperative intravenous anesthesia., lasted 1 hour. Postoperative oxygen saturation was 98%. Ventilator parameters were adjusted down. On March 25, 2017, the patient's condition improved, consciousness was clear, and breathing was smooth. Adjust the ventilator ventilation mode to V-SIMV-PS. BGA:pH: 7.358, PCO2: 43.3 mmHg, PO2: 75.0 mmHg, SO2: 98.0%, and FiO2: 40.0%. To evacuate the ventilator. Then to remove the tracheal intubation, low flow nasal catheter oxygen. No BT complications occurred during follow-up and no acute attack of asthma occurred. He was treated with budesonide formoterol powder inhaler. The patient's lung function was reviewed on April 20, 2017 in our hospital: Prompt for severe obstructive airway dysfunction, ACT 23, ACQ 0 . On April 21, 2017, the bronchoscope was reviewed and BT was performed concurrently. On April 22, the patient's condition was stable and he was discharged from hospital. After 3 months of follow-up, his asthma controlled well.

Conclusion

For critically ill patients with severe asthma, in the case of poor drug treatment and mechanical ventilation, emergency bedside broncho-thermoplasty is feasible and effective. It can save the patient's life in critical situations.

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(6) Submission ID#461800

A New Flexible Bronchoscopic Peripheral Cryoprobe Cryoablation in Ex Vivo Pig Lung and Liver

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Zheng Xiaoxuan – Interventional pulmonary

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Disclosure Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
To examine the efficiency and security of a flexible cryoprobe, we measured the size and temperature distribution of the frozen area (iceball) in ex vivo pig lung and liver and the temperature of the bronchoscope.

Methods
We evaluated flexible cryoprobe cryoablation using a bronchoscope in ex vivo pig lung and a flexible cryoprobe alone in ex vivo pig liver. Six temperature sensors were positioned at the surface of the cryoprobe and at distances of 0.3, 0.6, 0.9, 1.2, 1.5, and 1.8 cm from the cryoprobe. Two temperature sensors were positioned at the surface of the bronchoscope. The ex vivo pig lung and liver were perfused with 37 °C saline and the former was inflated using a ventilator to simulate in vivo lung conditions.

Results
In ex vivo pig liver, probes made iceballs 33.2 ± 0.2 mm in diameter. In ex vivo pig lung, probes made iceballs 35.1 ± 1.7 mm in diameter. The temperature at the surface of the bronchoscope at distances 1 and 10 cm from the cryoprobe reached 21.1 ± 0.1 and 10.5 ± 0.2 °C, respectively.

Conclusions
A flexible cryoprobe using a bronchoscope in ex vivo pig lung and liver was a sufficient safe treatment method for peripheral lesions.

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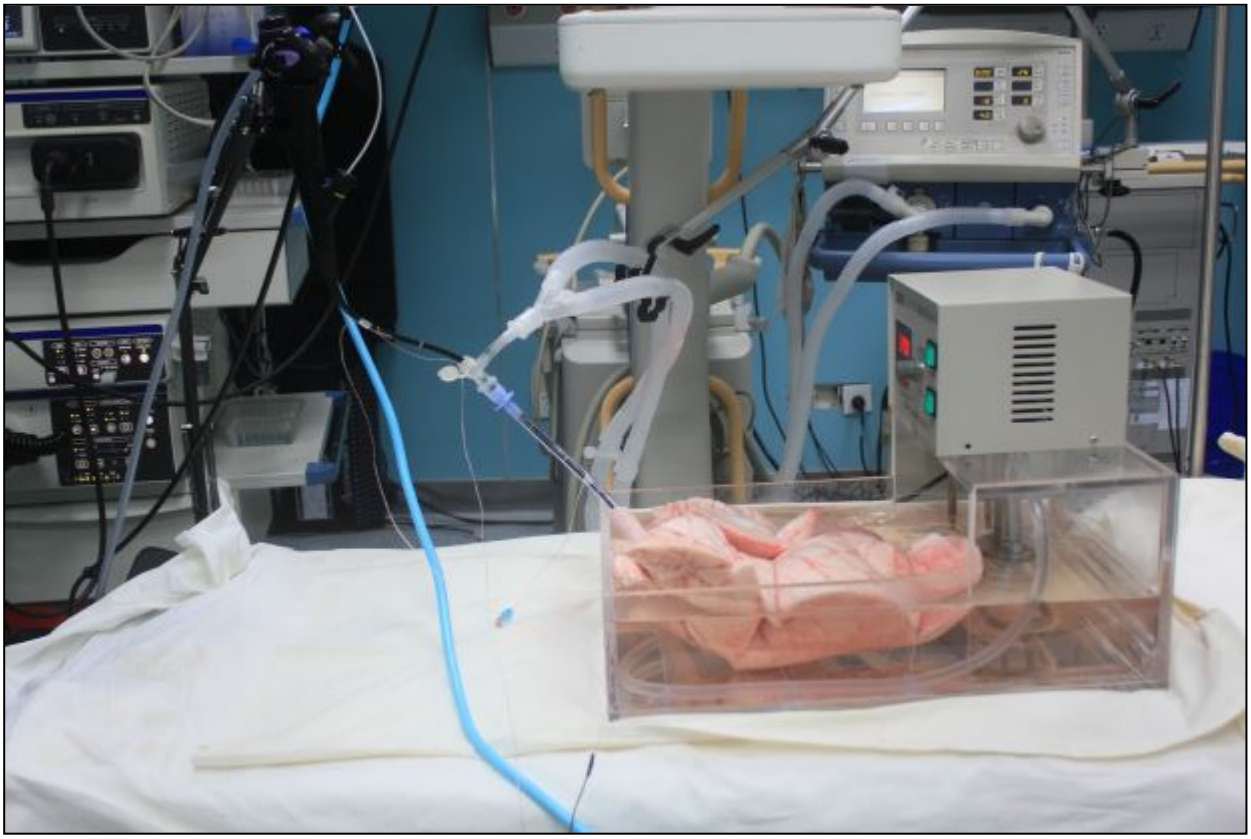

(7) Submission ID#452204

A New Technique for Self-Expanding Metallic Y-shaped Airway Stents Deployment, Safe and Simple

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Shuliang Guo – Department of Respiratory and Critical Care Medicine, the First Affiliated Hospital of Chongqing Medical University

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Self-expanding metallic Y-shaped airway stentsSEMYSare frequently used for airway stenosis and fistulae caused by thoracic neoplasm. The standard deployment procedure of SEMYS requires rigid bronchoscopy and fluoroscopy, which are not widely accessible in less privileged areas.

Methods
We have developed a new technique for SEMYS deployment with moderate sedation, under flexible bronchoscopy and without fluoroscopic guidance. An 8 internal diameter endotracheal tube (ETT) is used to secure the airway and to guide the delivery system through the curves around the glottis. The ETT is cut open lengthwise in advance except its distal tip is kept intact. After intubation with the modified ETT, the guide wire is inserted through the ETT, and a flexible bronchoscope is inserted beside the ETT, and subsequently the delivery system is advanced along the guide wire all the way to the carina and deployed under broncoscopic monitor.

Results
By the time of submission, we have completed 16 cases of SEMYS deployment in this method with no major complications.

Conclusions
This technique, safe, simple and swift, improves accessibility of SEMYS in less privileged areas.

(8) Submission ID#449387

A pilot study of a novel endoscopic lung volume reduction device

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Yan Hu – Peking University First Hospital, Beijing, China

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Disclosure Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

There is a clinical need for therapeutic options less invasive than surgical lung volume reduction that can reduce hyperinflation and alleviate exertional dyspnea of patients with severe emphysema.Several

technologies and devices had been developed for endoscopic lung volume reduction (ELVR). A new device, LVR-reversers, has been developed by Lifetech Scientific but its effect is unknown. Our study is aimed to investigate the safety and effectiveness of a novel ELVR device in pig model.

Methods

Twelve healthy pigs were included and randomly divided into three groups (group A-C). The LVR Reversers were implanted bronchoscopically into the selected airways using a proprietary delivery system under fluoroscopic guidance. The LVR Reversers could recover to the predetermined helical shape upon deployment. Physical examination, chest fluoroscopy, computed tomography (CT) scans, and bronchoscopic observations were performed during follow-up period. Necropsy was performed at one month (group A), three months (group B) and six months (group C) after treatment to assess the presence of complications and unintended injuries.

Results

A total of 47 LVR Reversers (median 4 for each pig, range [2,5]) were placed without severe complications.. The procedure was feasible and well tolerated by all pigs. No pneumothorax, abcesses and migration of Reverser were observed. Small opacities around some of LVR Reversers were shown on CT scans with a tendency of self-absorption. Mild granulation tissue was observed during surveillance bronchoscopy. The histopathology evaluation revealed a mild inflammatory reaction around the Reversers. Compared with baseline, there is a trend of volume reduction of the treated lung at one month and three months after treatment.

Conclusions

This study showed that LVR Reverser system was safe and feasible using for bronchoscopic lung volume reduction.

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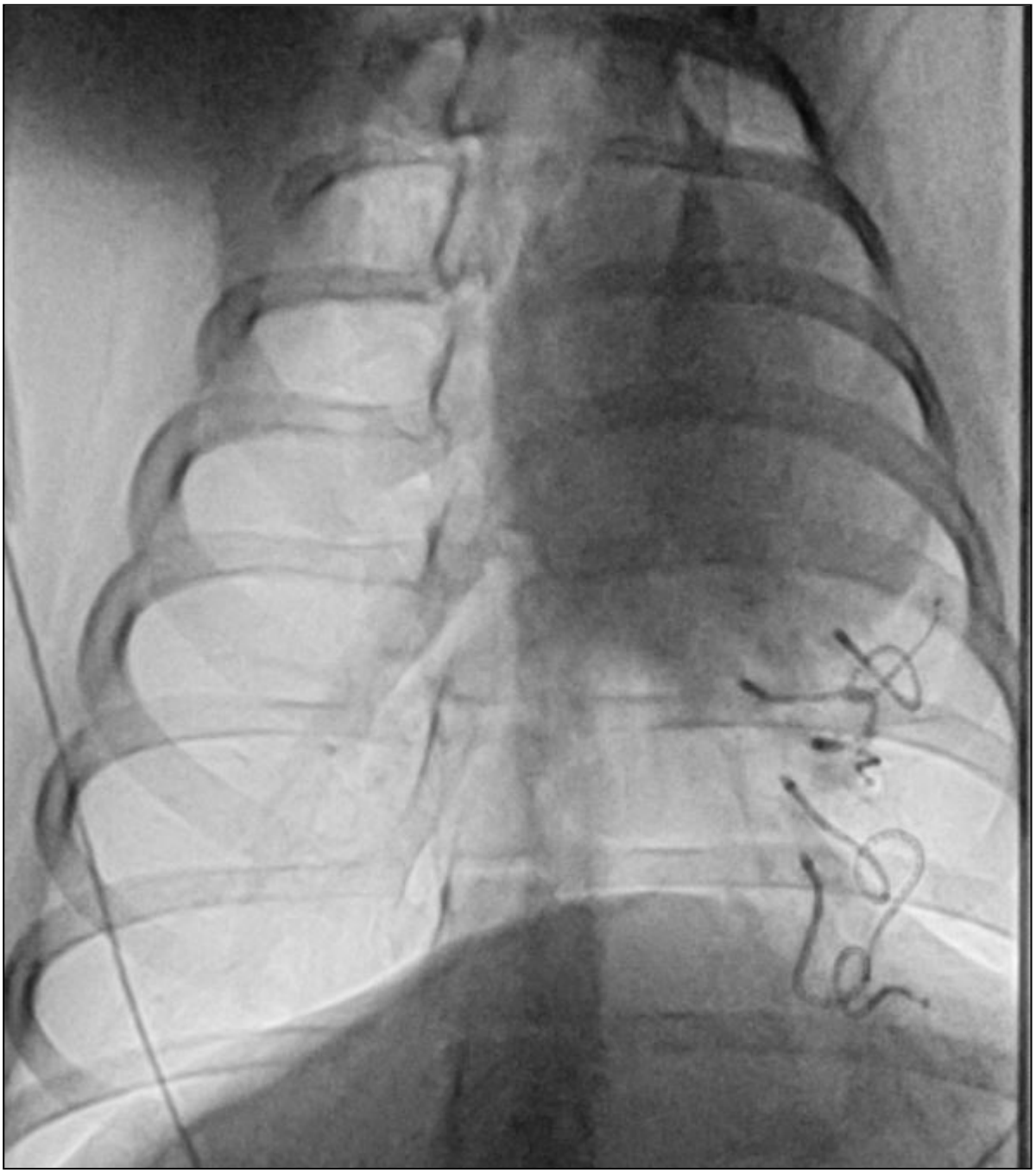

(9) Submission ID#459046

A prospective, randomized two-center trial for the comparison of 19G and 22G EBUS-TBNA-needles

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Filiz Oezkan – Department of Interventional Pneumology, University Medicine Essen - Ruhrlandklinik, Essen, Germany, The James Thoracic Cancer Center, The Ohio State University, Columbus, Ohio

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
22G or 21G-needles are recommended for lung cancer (LC) diagnosis and staging via Endobronchial Ultrasound (EBUS). Performance of detailed molecular work-up in LC patients increases the demand for tissue.
The aim of this prospective, randomized, two-center trial was to compare 19G and 22G EBUS-needles regarding feasibility, safety, performance, material and blood contamination.

Methods
Patients with a CT-scan suspicious for LC with mediastinal or hilar nodal metastases were enrolled. Either 19G or 22G EBUS-needles were used. A blood contamination score from 0 to 2 was applied. Samples were weighed and complications and final diagnoses were documented.

Results
A total of 114 patients were enrolled (56 in 19G/58 in 22G). Sample weight was assessed in 107 patients (54 in 19G/53 in 22G), providing 80% power to detect the effect size of 0.59 standard deviations in the sample weight between 19G and 22G groups using a two sample t-test with a two-sided alpha of 0.05. Samples obtained with the 19G needle contained more tissue after normalizing for blood contamination (p=0.0119). The diagnostic yield was equally adequate in both the 19G and the 22G groups. Four moderate EBUS-related bleedings occurred, 2 in the 19G group and 2 in the 22G group, hemostasis was rapidly achieved after xylometazolin application. Further complications did not occur.

Conclusions
EBUS-TBNAs with a19G-needle contain significantly more tissue with similar safety profile compared to 22G. Further research is needed to investigate the relevance of this finding in terms of molecular analyses.
Clinical Trial Registration
Clinical Trials.gov (NCT02813603)

(10) Submission ID#459412

A randomized control trial - the utility of virtual bronchoscopy using workstation to diagnostic bronchoscopy for peripheral pulmonary lesions -

Submission Type: Oral Presentation ONLY
Submission Status: Complete
Submitter: Yuji Matsumoto – National Cancer Center Hospital

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Disclosure: Does Disclose
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
An accurate approach is necessary to diagnostic bronchoscopy for peripheral pulmonary lesions (PPLs). Although electromagnetic navigation is recommended, the cost is too expensive to use it constantly. Instead, we reported the potential of virtual bronchoscopy (VB) using workstation as another guiding option. Some kinds of workstation are usually available in many hospitals for general purpose. In this multicenter randomized control trial, we verified the utility of the VB.

Methods

Patients with small (30.0 mm or less) PPLs with solid feature that suspected primary lung cancer were enrolled at 5 institutions in Japan from November 2015 to June 2017. They were randomly assigned to the two groups: procedures with or without VB (VB or non-VB group). Radial endobronchial ultrasound (R-EBUS) with a small guide sheath (GS) was induced to the target PPL through a thin bronchoscope according to the randomized way. When R-EBUS showed within or adjacent to, the images were defined as visible. All procedures were performed under conscious sedation, and only a brush and a forceps contained in a small GS kit were permitted to use for sampling. The visualization yield by R-EBUS (visible number divided by total) was analyzed as a primary endpoint. In addition, the diagnostic yield, procedure time, and complication between the two groups were compared as secondary endpoints. This study was supported by the National Cancer Center Research and Development Fund (25-A-12, 28-K-1, and 29-A-13).

Results

Finally, 247 cases were eligible for the analyses (124 in VB and 123 in non-VB group). The visualization yield was significantly higher in VB group than non-VB group (97.6% vs. 89.4%, p=0.008). Following a multivariate analysis, use of VB was a signicant factor (p=0.008, odds ratio [95% confidence interval]: 5.58 [1.53-27.87]). Meanwhile, even though there was no significant difference, the diagnostic yield was higher in VB group (82.3% vs. 74.0%, p=0.078). Besides, the procedure time (median [range]) was signicantly shorter in VB group (15.7 [9.1-39.7] min. vs. 19.2 [8.3-43.8] min., p<0.001). Concerning complication, both groups did not cause any severe ones, but there were two pneumothorax cases in non-VB group.

Conclusions

The VB using workstation leads us to target PPLs more precisely and rapidly.

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Image or Table

	Visible (n=231)	Invisible (n=16)	Univariate	Multivariate	
			p value	*p* value	Odds ratio (95% CI)
Age (year), no. (%)			0.104	0.054	-
≤70	125 (91.2)	12 (8.8)			
>70	106 (96.4)	4 (3.6)			
Sex, no. (%)			0.892	0.582	-
Male	155 (93.4)	11 (6.6)			
Female	76 (93.8)	5 (6.2)			
Size (mm), no. (%)			<0.001*	0.007*	7.13 (1.65-50.18)
≤20.0	99 (87.6)	14 (12.4)			
>20.0	132 (98.5)	2 (1.5)			
Lobe, no. (%)			0.771	0.354	-
RUL/LUS	117 (94.4)	7 (5.6)			
RML/Lingula	30 (90.9)	3 (9.1)			
RLL/LLL	84 (93.3)	6 (6.7)			
Location, no (%)			0.082	0.172	-
External 1/3	172 (92.0)	15 (8.0)			
Internal 2/3	59 (98.3)	1 (1.7)			
Distance from costal pleura (mm), no (%)			0.192	0.375	-
≤10.0	135 (91.8)	12 (8.2)			
>10.0	96 (96.0)	4 (4.0)			
Bronchus sign, no. (%)			0.005*	0.068	-
Positive	185 (95.9)	8 (4.1)			
Negative	46 (85.2)	8 (14.8)			
Nearest bronchus order, no. (%)			0.026*	0.246	-
≤6	138 (96.5)	5 (3.5)			
>6	93 (89.4)	11 (10.6)			
Visibility on chest X-ray, no. (%)			0.048*	0.153	-
Visible	180 (95.2)	9 (4.8)			
Invisible	51 (87.9)	7 (12.1)			
Use of VB, no. (%)			0.008*	0.008*	5.58 (1.53-27.87)
With (VB group)	121 (97.6)	3 (2.4)			
Without (non-VB group)	110 (89.4)	13 (10.6)			

Table. Factors affecting the visualization yield (n=247)

CI: confidence interval, RUL: right upper lobe, LUS: left upper segment, RML: right middle lobe, RLL: right lower lobe, LLL: left lower lobe, VB: virtual bronchoscopy

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(11) Submission ID#455747

A randomized trial of ultrathin versus thin bronchoscopy using multiple guidance modalities to diagnose peripheral pulmonary lesions: Preliminary results

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Fumihiro Asano – Department of Pulmonary Medicine, Gifu Prefectural General Medical Center

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Disclosure: Does Disclose

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Olympus (The prototype ultrathin bronchoscopes were loaned to the authors by Olympus, Tokyo, Japan.Other Financial or Material Support)

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
A previous randomized study showed that the diagnostic performance of 3-mm ultrathin bronchoscopy with endobronchial ultrasound (EBUS) was superior to that of 4-mm thin bronchoscopy with EBUS and a guide sheath (GS). However, the 4-mm bronchoscope has a 2-mm working channel, thus allowing the use of a standard forceps or performance of transbronchial needle aspiration (TBNA) if the GS is not used. The purpose of the present study was to compare the diagnostic yield of 3-mm ultrathin bronchoscopy with that of 4-mm thin bronchoscopy in the diagnosis of peripheral pulmonary lesions.

Methods
Patients with peripheral pulmonary lesions <30 mm in diameter were included and randomized to undergo EBUS, virtual bronchoscopy, and fluoroscopy-guided 3-mm ultrathin bronchoscopy (the UTB group) or 4-mm thin bronchoscopy (the TB group). In the TB group, the use of a GS method employing a small forceps or a non-GS method using a standard forceps was permitted. In addition, TBNA was performed on patients when the EBUS probe could not be inserted into the lesion in the TB group.

Results
We recruited 360 patients and 356 were finally analyzed. In the TB group, the GS method of EBUS-guided forceps biopsy was employed in 59% of cases. In addition, TBNA was performed in 28%. The diagnostic yields of the UTB and TB groups were 70% and 59%, respectively ($p = 0.027$).

Conclusions
The diagnostic yield of 3-mm ultrathin bronchoscopy under multimodal guidance was higher than that of 4-mm thin bronchoscopy when diagnosing peripheral pulmonary lesions.

(12) Submission ID#477737

A rare cause of recurrent fatal hemoptysis: a case report of Dieulafoys disease of the bronchus

Submission Type: Case Report

Submission Status: Complete

Submitter: Wang Feng – Beijing Chao-yang Hospital,Beijing,China

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Dieulafoy's disease is characterized by the tortuous arteries of abnormally large caliber running within the submucosa, which is susceptible to ulceration and bleeding. This vascular abnormality occurring in the bronchial system is rare. Massive hemoptysis caused by Dieulafoy's disease of the bronchus is a life-

threatening condition. An immediate and effective treatment is required in emergency to improve survival. Here, we report a patient who had such a vascular anomaly in bronchus and presented with recurrent massive hemoptysis.

Case Report

A 21-years-old non-smoking woman was transferred to our clinical center from local hospital with massive hemoptysis. There was no medical history in this patient. Before admission, she had two severe episodes without any premonitory symptoms, approximately 300ml~400ml blood for each time. General physical examinations and laboratory tests were unremarkable except for moderate anemia. Computed tomographic scan in the local hospital showed ground glass opacity due to aspiration of the blood in the right lower lobe, and computed tomographic angiography revealed convoluted vessels originated from the thoracic aortic. During the bronchoscopy, there were some bleeding from the right lower lobe bronchus and two apophyses of about 3~5 mm in diameter were found at the entrance to the right lower lobe bronchus. It arose from the surface with apparently normal mucosa. Because of suspicion of vascular malformation of the bronchus, the bronchoscopist was refrained from performing any biopsy. After admission, selective bronchial arteriography was consequently performed and it showed tortuous, dilated and elongated branches of the bronchial artery in the region of the right lower lobe bronchus.Following the bronchial arteriography, embolization of the feeding artery of the angioma-like vascular malformation of the right bronchial artery was performed using three 3mm coils to control the hemoptysis. After embolization, hemoptysis did not recur in the follow-up period of 3 months.

Conclusion

Dieulafoys disease is a rare vascular anomaly consisting of a dysplastic artery in the submucosa. It is mostly seen in the gastrointestinal tract and is relatively rare in the bronchial tree. Massive hemoptysis caused by Dieulafoy's disease is a life-threatening condition. Selective bronchial arteriography and computed tomography angiography can show dilated bronchial arteries, which can be helpful in making the diagnosis. It is noteworthy that the endoscopic recognition is critical to prevent iatrogenic lethal hemorrhage. A bronchoscopist must pay extra attention in case of hemoptysis and avoid biopsy when Dieulafoys lesion is suspected. A prompt and efficient intervention is required in emergency to improve survival.

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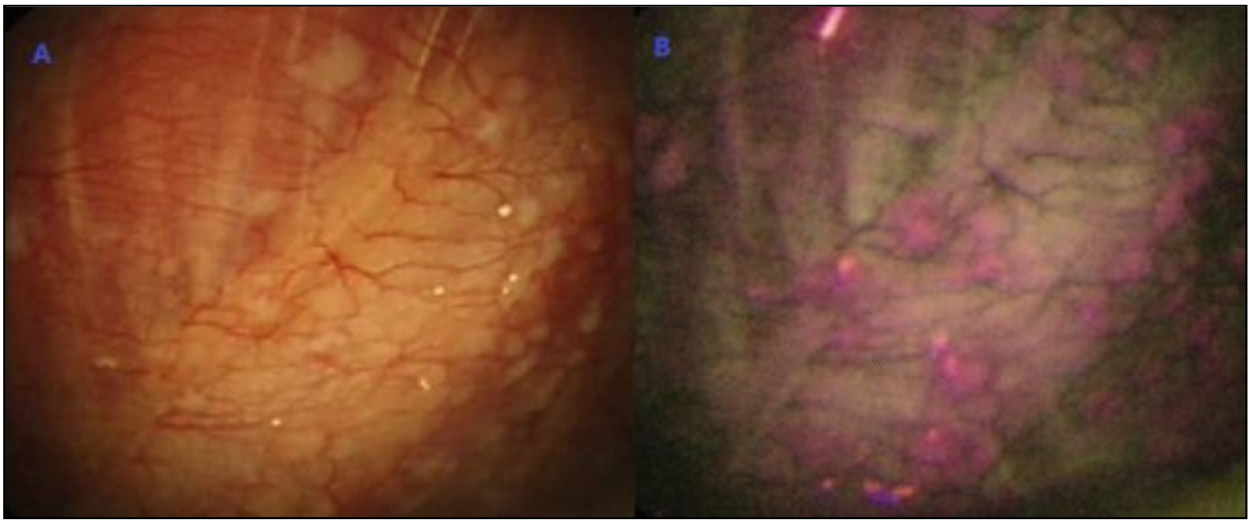

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Dieulafoy's disease.pptx

(13) Submission ID#459016

A simplified method of transesophageal needle aspiration with an ultrasound-guided bronchoscope (EBUS-TENA)

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Shuliang Guo – Department of Respiratory and Critical Care Medicine, the First Affiliated Hospital of Chongqing Medical University

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Biopsy via the esophagus plays an important role in the diagnosis of mediastinal lymphadenopathy and lesions, and the use of an ultrasound guided bronchoscope in the esophagus (endobronchial ultrasound transesophageal needle aspiration, EBUS-TENA) has been proved reliable by accumulating evidence. However, EBUS relies on a high level of proficiency in sonography, and accurate identification of the anatomical structures is vital for successful harvest of samples. To circumvent the anatomical and sonographic difficulties, we have developed a simplified method of TENA.

Methods
Localization of the lesions is achieved mainly through chest CT scans instead of real-time ultrasound imaging. The distance of the lesion from the glottis or the cardia (D) was calculated by multiplying the number of planes between the glottis/cardia and the lesion (N) and the thickness of each plane (T), i.e. D=N*T. The position of the lesion relative to the esophagus on the transverse plane is recorded by the clock position. It is of note that the clock position of the lesion when the patient lies before the pulmonologist in the procedure is different from that on the CT scan display. With these information, the lesion can be easily localized by the bronchoscope in the esophagus, and the ultrasound probe serves to confirm the location of the lesion and distinguishes the surrounding tissues, which guarantees a safe and accurate puncture.
The simplified method has been successfully carried out on 8 patients. On 6 of the patients, both the modified TENA and traditional EBUS-TBNA were carried out, and comparison was made between the two techniques.

Results
In the 6 patients who received both procedures, the pathological diagnosis of samples harvested by the two techniques were identical (2 cases of non-small cell lung cancer, 2 adenocarcinoma, 1 lymphoma, 1 small cell lung cancer). Meanwhile, the simplified TBNA requires no sedation, lower oxygen flow, shorter procedural time and provokes less coughing compared with traditional EBUS-TBNA.

Conclusions
The adjustments of the simplified TENA technique are safe, simple, effective and patient-friendly compared with traditional EBUS-TENA and TBNA.

(14) Submission ID#456822

Adequacy of endobronchial ultrasound (EBUS) for PD-L1 expression testing

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Rahul Sood – Lahey hospital and medical center, Burlington, MA

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Several immune check point inhibitors that target the programmed death receptor 1 (PD-1) and programmed death ligand 1 (PD-L1) have been shown to prolong progression free survival in patients with advanced non small cell lung cancer (NSCLC). These include agents such as pembrolizumab, nivolumab and atelozilumab. In patients with tumor PD-L1 expression >50 %, pembrolizumab is approved as first line therapy. The 2017 National Comprehensive Cancer Network (NCCN) guidelines recommend quantifying PD-L1 expression on tumor cells upon diagnosis of advanced NSCLC. Since PD-L1 expression is evaluated by immunohistochemistry (IHC), acquisition of adequate amounts of biopsy material to perform these assays is important. It is as yet unclear if samples from endobronchial ultrasound guided transbronchial needle aspiration (EBUS TBNA) provide adequate tumor cell volume to meet these requirements . Additionally, the optimal number of aspirations per EBUS TBNA procedure required for maximal diagnostic yield in these cases is unknown.

Methods
We retrospectively identified all patients diagnosed with advanced NSCLC who had undergone EBUS TBNA for tissue acquisition and PD-L1 IHC (22C3 pharmDx) testing between October 2016 and October 2017 at our institution. IHC was performed on cell blocks and > 100 viable tumor cells were required for interpretation. We also recorded the age, sex, number and location of lymph nodes sampled, the number of needle passes per nodal station and the final diagnosis.

Results
Samples obtained in cell block by EBUS TBNA were tested for PD-L1 expression in 18 patients with mean age of 70 years. 16/18 (89%) samples were adequate for evaluation. Diagnoses included adenocarcinoma (61%), squamous cell carcinoma (28%) and NSCLC not otherwise specified (11%). IHC (PD-L1 expression >1%) was positive in 11 specimens, negative in 5 specimens and unsatisfactory for evaluation in 2 specimens. Lymph nodes that showed malignant cells were classified as positive. A mean of 6.67 and median of 6 passes per positive lymph node were obtained. The median number of positive lymph nodes sampled per patient was 1.

Conclusions
EBUS TBNA provided specimens of adequate cellularity for PD-L1 IHC testing in the majority of cases, even

after the specimens were first utilized for molecular analysis. In patients with advanced NSCLC, a higher number of needle passes per positive lymph node may be required to obtain adequate amounts of tissue for routine IHC, molecular and PD-L1 expression testing.

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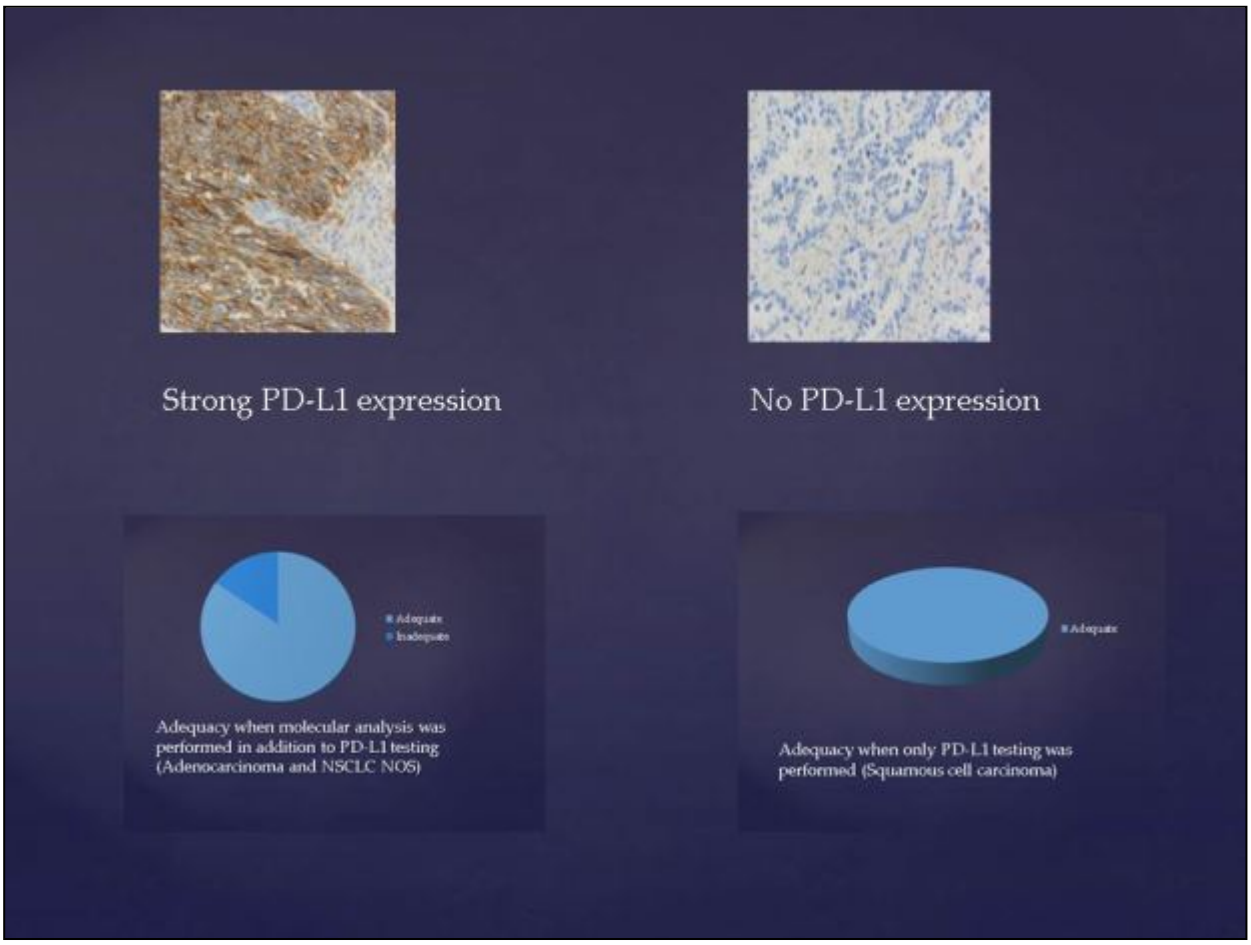

(15) Submission ID#458768

Airway Complications After Lung Transplantation And Donor Specific Antibodies: Prevalence In A Single-Centre Cohort

Submission Type: Poster Session ONLY
Submission Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Airway complications (AC) following lung transplantation remain a significant cause of morbidity and mortality. The management of bronchial complications may require interventional bronchoscopy (mechanical debridement, balloon bronchoplasty and/or bronchial stenting). A better knowledge of the AC prevalence and their contributing factors could help for a better appreciation of the problem. The purpose of this study was to retrospectively analyse the prevalence of AC requiring therapeutic interventions and also the prevalence of donor specific antibodies (DSA) in this particular group of patients.

Methods
Between January 2010 and December 2016, 269 single-lung, double-lung and heart and lung transplantations were performed at Marie Lannelongue Hospital, Le Plessis-Robinson, France. All the patients requiring endobronchial treatment (mechanical debridement, balloon bronchoplasty and/or bronchial stenting) were included in this retrospective analysis. The prevalence of DSA was recorded in the endobronchial treatment group and compared to the group of patients not requiring therapeutic interventions.

Results
Most of the patients had single and double-lung transplantation (86.9% - 234 patients). Combined heart and lung transplantation was excluded from the analysis. 51 patients (21.7%) presented airway complications requiring endobronchial treatment. The main indications for lung transplantation for these patients were: idiopathic pulmonary arterial hypertension (27.4%), emphysema (17.6%) and idiopathic pulmonary fibrosis (19.6%). A total of 233 procedures were performed in 51 patients. 16 patients (31.3%) required bronchial stenting (6.8% out of the lung transplant cohort). Other interventional therapeutic procedures included balloon bronchoplasty and mechanical debridement with dilatation only. The DSA prevalence in the endobronchial treatment group was 68.6%. In the rest of the lung transplant cohort the DSA prevalence was 32.2%.

Conclusions
Airway complications after lung transplant remain a significant problem. A higher prevalence of DSA is noted in endobronchial treatment group. Interventional bronchoscopy is essential in the management of airway complications in patients after lung transplantation, as the majority of patients are not suitable for repeated surgery. Prospective studies using a standardised classification of airway complications are mandatory to better identify risk factors and predict outcome.

(16) Submission ID#477808

anagement of persistent air leaks in secondary spontaneous pneumothorax patients with alveolar-pleural fistula by endobronchial autologous blood patch and spigots occlusion : a multicentre randomized control trial in China.

Submission Type: Poster Session ONLY
Submission Status: Complete
Submitter: Hai-tao Zhang – Department of Respiration, Tangdu Hospital, Fourth Military Medical University

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
The optimal management of persistent air leaks in secondary spontaneous pneumothorax is still inconclusive. Endobronchial intervention techniques like autologous blood plus patch and spigots occlusion had been documented as effective treatments for persistent air leaks in several case or case series reports.This study was conducted to evaluate the efficacy and safety of endobronchial autologous blood plus thrombin patch (ABP) and bronchial spigots occlusion (BSO) in secondary spontaneous pneumothorax patients with alveolar-pleural fistula and persistent air leaks.

Methods
This prospective multicentre randomized control trial compared prolonged observation with chest tube

drainage (CTD), endobronchial autologous blood patch , and bronchial spigots occlusion performed in secondary spontaneous pneumothorax patients from December 2014 to December 2017 in one of five tertiary care hospitals in China. Patients who were diagnosed with persistent air leaks (despite 7 days of CTD) and unsuitable for Surgical treatments were included. Outcomes included success rate of pneumothorax resolution at the end of the observation period (14 days), duration of air leaks stop, duration of lung expansion, duration of hospital stay, and complications were recorded.

Results

150 subjects were randomized to CTD (n=50) , ABP (n=50) , and BSO (n=50). Baseline characteristics were similar between groups. At 14 days, 62% of CTD, 82% of ABP, and 84% of BSO subjects had pneumothorax fully resolution (p=0.017). All duration features (air leaks stop, lung expansion, hospital stay) demonstrated a significantly shorten in ABP and BSO compared with CTD (p<0.001, all). The incidence of adverse events like chest pain (>3, visual analogue scale), cough (>3, visual analogue scale), fever (>38) was not significantly differentbetween groups. All subjects in ABP and BSO had temporary hemoptysis (<10 ml). Spigots displacement occurs in 8% of BSO subjects.

Conclusions

Both ABP and BSO treatment in secondary spontaneous pneumothorax patients with alveolar-pleural fistula and persistent air leaks resulted in clinically meaningful benefits in success rate, duration of air leaks stop, duration of lung expansion, hospital stay, with an acceptable safety profile.

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Table 1 Outcomes

	CTD (n=50)	ABP (n=50)	BSO (n=50)	p Values
Success of pneumothorax resolution	31 (62%)	41 (82%)*	42 (84%)*	0.017
Duration of air leaks stop (days)	8.39±2.16	6.02±1.42*	5.21±1.66*	0.000
Duration of lung expansion (days)	9.48±1.98	6.59±1.45*	6.31±1.55*	0.000
Duration of hospital stay (days)	10.06±2.00	8.12±1.60*	7.31±1.62*	0.000

Data are presented as mean±s.d. or n (%). p Values was calculated using chi-square test or Kruskal-Wallis non-parametric test. *p<0.05 compared with CTD using post-hoc Bonferroni's test.

(17) Submission ID#459432

Analysis of 24 cases of bronchial fistula cured by implantation of nitinol double drum type occluder

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Yu Chen – The first affiliated hospital of Guangzhou medical university

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Bronchial fistula is a common clinical problem in pulmonary disease and post-surgery operation. By traditional skills include stents and secondly operationlow healing rate and high complication rate is still an open question . We aim to explore the clinical effect of implantation of nitinol double drum type occluder using on bronchial fistulas, and establish a reliable, safe and effective skill in diagnosis and treatment for bronchial fistulas .

Methods
Participants: Patients with post-surgery bronchial fistula treated in our department from January 2014 to December 2016.
Methods: Patients with clinical diagnosis of bronchial fistula, improve the following procedures: 1. chest contrast enhanced CT for understanding of postoperative intrathoracic vascular structure and distribution; 2. bronchoscopy airway exam for understanding the fistula and the bronchus lumen; 3. Interventional Bronchogram by bronchoscope guide contrast agent injection around the fistula and monitoring under X-ray fluoroscopy; 4.determine the fistula about location, diameter, the affiliated bronchial lumen, and the distance to

thoracic outlet ; 5. Guided by flexible bronchoscopy and wire implant nitinol double drum type occluder. 6. Follow-up by chest X-ray and bronchoscopy after 1, 6, 12 months, and survival period of long-term clinic follow-up.

Results

A total of 24 patients were enrolled, including 15 male and 9 female, mean age 65.4 years; including: 6 cases of left main bronchial fistula, 8 cases of right main bronchial fistula, 4 cases of bronchus fistula, 2 cases of right lower lobe bronchial fistula, 3 cases of right upper lobe bronchial fistula, 1 cases on the left the bronchial fistula, were postoperative fistulas. All patients were successfully implanted nitinol double drum type occluder in the fistula of bronchial stump . The fistula accounted for 4~14mm of linear distance, the average is 7.68mm; the implanted occluder device diameter is 10~26mm, average is 18.62mm; all cases were performed under conscious sedation and local anesthesia by flexible bronchoscpy, average operating time was 18.6 minutes; the follow-up of 6~40 months, all cases of fistula were completely closed, achieved clinical cure, no sever the adverse reactions and complications.

Conclusions

Transbronchial implantation of nitinol double dump type occluder for bronchial fistula is a safe and effective, reliable and convenient treatment.

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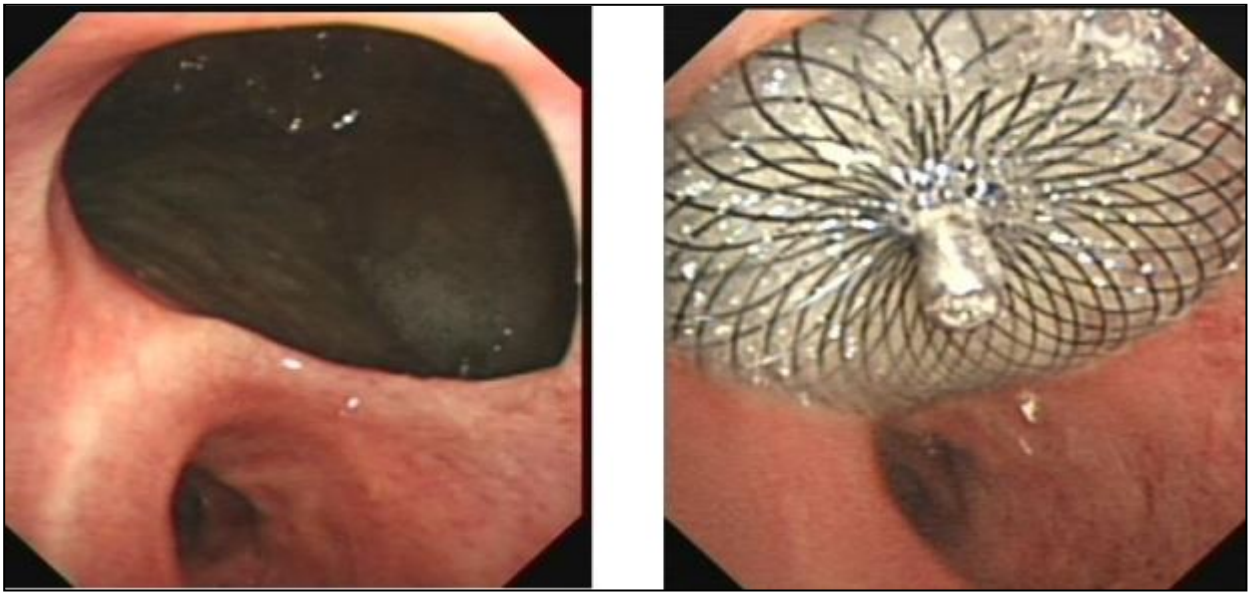

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Analysis of 24 cases of bronchial fistula cured by implantation of nitinol stump-type occluder.pptx

(18) Submission ID#459056

Analysis of laboratory confirmed infectious pathogens after self-expand metallic airway stent implantation in patients with malignant central airway stenosis

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Daxiong Zeng – First Affiliated Hospital of Soochow University

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Malignant central airway stenosis is a common complication in patients with advanced malignant tumors. The implantation of self-expand metal airway stent is one of the most important and timely measures for the treatment of such patients. However, intratracheal infection is a common complication of the metal airway stent, which affects the prognosis of the patients.

Methods
In this study, we analyzed the data from 19 patients with malignant central airway stenosis who had been followed up for 1 weeks, 8 weeks and 24 weeks after metal stent implantation. Protected specimen brush and common specimen brush were both used for secretion collection from stents in central airway.

Results
The positive rate of laboratory diagnosis for all patients at 1 weeks , 8 weeks and 24 weeks were 2/19, 3/8 and 4/5 respectively. At 1 weeks, only secretion culture from 2 patients showed infection (both staphylococcus auras). At 8 weeks, secretion culture from 3 patients showed infection (staphylococcus auras, pseudomonas aeruginosa and enterobacter cloacae). At 24 weeks, secretion culture from 4 patients showed infection (Stenomonas maltophilia, candida albicans and 2 staphylococcus auras). No matter at which follow-up time point, the results of laboratory diagnosis from protected specimen brush or the common specimen brush for secretion collection were complete anastomosing.

Conclusions
So, we concluded that patients with malignant central airway stenosis have the risk of intratracheal infection after metal airway stent implantation. The longer the time, the higher the infection rate. Staphylococcus auras is the most common pathogen.

(19) Submission ID#459123

Analysis of the treatment effect on childhood bronchial tuberculosis with the combination interventional treatment

Submission Type: Oral and Poster
Submission Status: Complete
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Interventional Pulmonology

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Background
Bronchial tuberculosis is involving the tracheal and bronchial mucosa and submucosa, and the muscular layer or cartilage may result in luminal stenosis and occlusion. Respiratory interventional therapy is very important.The purpose of this article is to evaluate the treatment effect on childhood bronchial tuberculosis with the combination interventional therapy.

Methods
38cases bronchial tuberculosis patients ,whose sputum acid bacilli smear were negative, aged from 12months to 18 years old,the average age is 8.5±5.7,While receiving the anti-tuberculosis treatment, the bronchoscope interventional treatment were given.Children were randomly divided into conventional treatment group (A group)and combined treatment group(B group).The former was given airway cleaning by saline irrigation or biopsy forceps clips , spray isoniazid on mucosa;The latter was selective given Cryoablation, thermal ablation therapy, balloon dilatation, intramediastinal lymph nodes injection with TBNA needle ,etc. in addition to the conventional treatment .Compared the number of treatment times and their lung function improvement . Children under the age of five compared the tPTEF/tE, the age of five or more children compared FEV1 (%) .

Results
The interventional treatment times of the A group and B group were 7 .3±3.4,5.1± 2.8 respectively , the difference was statistically significant ($P < 0.05$). The Lung function are similar between the two groups before treatment, no statistical significance ($P > 0.05$). But after treatment , the tPTEF/tE of the A group and B group were 21±7,27±8 respectively, FEV1 (%) were 65.2±8.5 80.1±7.8 respectively, the difference were both statistically significant ($P < 0.05$).

Conclusions
The combination interventional treatment with the appropriate intervention means is beneficial to the recovery of childhood bronchial tuberculosis.

(20) Submission ID#420691

Aortotracheal fistula - A rare cause of intermittent hemoptysis

Submission Type: Case Report
Submission Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Fistula between aorta and trachea is rare and potentially fatal. We report a patient who survived intermittent episodes of hemoptysis over a period of 6 months due to aortotracheal fistula

Case Report

74-year-old man presented with six-month history of intermittent hemoptysis. Initial episode occurred while on anticoagulation. Bronchoscopy was nondiagnostic. Hemoptysis recurred despite discontinuation of anticoagulation.

Medical history includes remote AAA repair, CAD, DVT, HTN, DM, dyslipidemia. vitals stable. Examination unremarkable. CXR showed LUL infiltrate. CTA chest revealed atherosclerotic calcifications and penetrating atherosclerotic ulcer involving the mid aortic arch. Chest MRA confirmed a penetrating atherosclerotic ulcer extending from the posterior wall of the aortic arch to the mid trachea. Repeat bronchoscopy demonstrated extrinsic compression along the distal left lateral wall of the trachea. Mucosa was intact. EBUS doppler revealed aortic diverticulum. Patient underwent thoracic endovascular aneurysm repair.

Fistula formation between the aorta and the tracheobronchial tree is rare and potentially fatal. It is usually preceded by periods of intermittent hemoptysis. Duration of repeat hemoptysis before diagnosis ranges from days to months. If unrecognized, it can cause immediate death. Most common site is between the descending aorta and the left lung. Fistulas can be challenging to localize due to their small size and intermittent bleeding. Clots easily occlude fistulas for days or months. During quiescent periods, the endobronchial appearance of the fistula may be unremarkable. However, when clots dislodge, the fistula reopens and new bleeding ensues. This process tends to be recurrent with progressive enlargement of the fistula, resulting in massive bleeding. Bronchoscopy must be conducted with care, as it can be misleading and dangerous, by being falsely reassuring or by dislodging the clot. Causes of fistula include radiation, tumor, aortitis, atherosclerotic aneurysm, previous aortic procedures. In our patient, the cause was presumed to be chronic external tracheal compression from an atherosclerotic ulcer.

Diagnosis can be delayed due to failure to identify risk factors, or to consider the diagnosis. In our patient, the diagnosis was suggested with CTA and MRA, and confirmation made via EBUS Doppler. Once the diagnosis is recognized patients should be referred for urgent repair.

Conclusion

Physicians must be alert to the possibility of aortotracheal fistula in patients with intermittent hemoptysis and atherosclerotic calcifications or previous thoracic aortic surgery. Diagnosis can be difficult to make with airway inspection only. Endoscopic ultrasound, CTA or MRA can provide important information. Urgent repair is paramount for this fatal condition.

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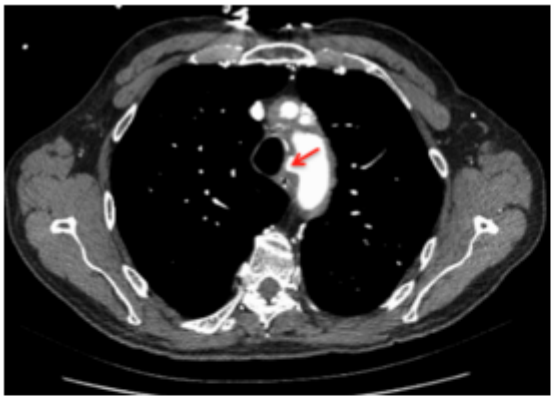
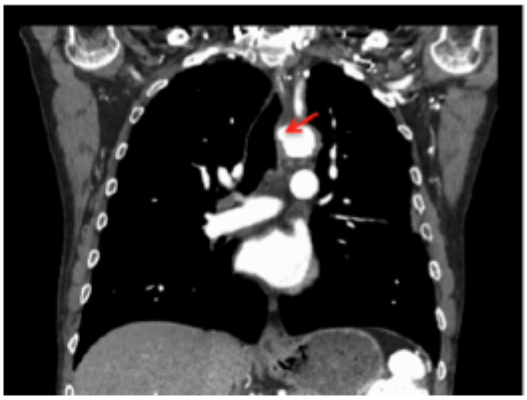
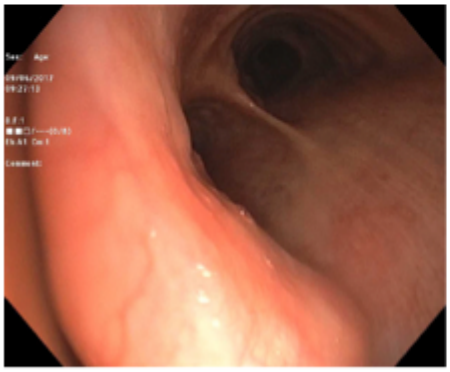


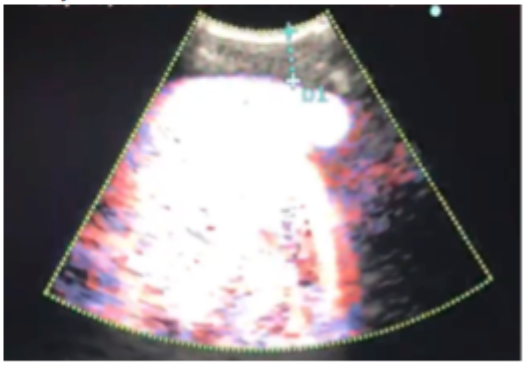
A: Contrast enhanced CT, axial image, showing saccular outpouching of contrast (aneurysm) from the right side of the transverse arch.



B: Contrast enhanced CT, coronal image, showing extrinsic compression of the distal trachea by the aneurysm.



C: Bronchoscopy image showing extrinsic compression of the distal trachea with normal appearing mucosa.



D: EBUS view from the lower trachea in power Doppler mode showing aortic aneurysm 3 mm from the tracheal lumen.

(21) Submission ID#452087

Application of Transmission Electron Microscopy in the etiologiy diagnosis of severe pneumonia via BALF: A Retrospective Study

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Yuanyuan Li – Department of Respiratory and Critical Care Medicine, Xiangya Hospital, Central South University

---

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Severe pneumonia is responsible for great mortality and morbidity worldwide, and early-applied effective antibiotics are critical for good prognosis of patients. However, identification of infectious agents in severe pneumonia remains a major challenge. In this study, we aimed to evaluate the potential application of transmission electron microscopy (TEM) in etiologic diagnosis of severe pneumonia via BALF.

Methods
A total of 106 patients diagnosed with severe pneumonia at our hospital were included, and baseline characteristics of these patients were collected. Infectious agents detected by TEM in bronchoalveolar lavage fluid were summarized. Bacterial culture results of lower respiratory tract specimens and serological test results were also assessed.

Results
TEM revealed 74 bacteria, 24 viruses, 16 mycoplasmas and 10 chlamydia in 99 samples (61 samples were mixed infections), while pathogens in 7 samples were not detected, which supported that transmission electron microscopy had a good sensitivity in detecting infectious agents in bronchoalveolar lavage fluid. The detection rate of TEM was significantly higher when compared with bacterial culture or serological tests. Combined use of transmission electron microscopy with other diagnostic techniques significantly improved the detection rate of possible infectious agents in patients with severe pneumonia.

Conclusions
Our data support that TEM could facilitate the etiologic diagnosis of severe pneumonia via BALF and may consequently increase the opportunity of initial appropriate treatment.

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(22) Submission ID#476102

At EBUS TBNA the DNA content on Rapid On site Examination (ROSE) slides is consistently higher than DNA content of Cell Block, and is independent of number of needle passes.

Submission Type: Oral Presentation ONLY
Submission Status: Complete
Submitter: David Fielding – Royal Brisbane and Womens Hospital

---

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Interventional Pulmonology

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- No

Background
For genetic assessment of EBUS TBNA material, an unspecified number of additional needle passes into the node have been suggested (1). We studied the number of needle passes required to obtain sufficient DNA for Next Generation Sequencing (50 ng) both from cell block material and from the ROSE slides themselves.

Methods
Institutional Ethics committee approval was obtained and all patients gave written informed consent. Consecutive patients with a provisional diagnosis of lung cancer referred for diagnostic EBUS-TBNA were studied. At bronchoscopy EBUS-TBNA, Olympus 21 Gauge needles were used (NA-201SX-4021) with suction applied. Sample material was extruded into a saline pot for FFPE Cell Block (CB). The last drops were blown onto one slide for Diff Quik (DQ) slide ROSE, as well as a fixed slide. Once DQ was positive for malignant cells one further pass was taken. The maximum number of passes per node was five. Genomic DNA was extracted from 10-20 4µm sections of CB material and from the entirety of individual DQ cytology slides using a QIAamp DNA Micro Kit (QIAGEN Inc., Germantown, MD). DNA yields were measured using a Qubit dsDNA BR Assay (Thermo Fisher Scientific, Inc.Waltham, MA). The minimum DNA amount for amplicon-based NGS library preparation was set to 50 ng. Sequencing of 48 genes was performed using the TruSeq Amplicon Cancer Panel (Illumina, San Diego, CA) on a Miseq (2, data not shown in this abstract).

Results
From 76 consenting patients, malignancy was confirmed in 67 cases : 64 primary lung cancer (67% Adenoccarcinoma, 17% SCLC, and 16% squamous cell carcinoma) and 3 distant metastases. The median and number of EBUS-TBNA needle passes was 3. Significantly more DNA was obtained from DQ smears versus CB, providing mean DNA yield of 1740 ng and 434 ng for DQ smears and CB respectively (p=0.001).

DNA yield > 50ng was achieved for 43 FFPE CBs and 56 DQ smears. Median DNA yields from DQ smears following 2, 3, 4 or 5 needle passes were 1564 ng, 1534 ng, 1901 ng and 2914 ng respectively. High DNA yields often being obtained from samples collected with two or three needle passes (see Figure).

Conclusions

DQ slides contain abundant DNA for NGS which can be obtained by as few as 2 or 3 passes in the majority of cases. Ongoing study is devoted to confirming equivalence of NGS mutation detection from matched DQ and CB preparations.

(1)Wahidi Chest 2016;149:816-35.
(2)Fielding AJRCCM 2017;196:388-91.

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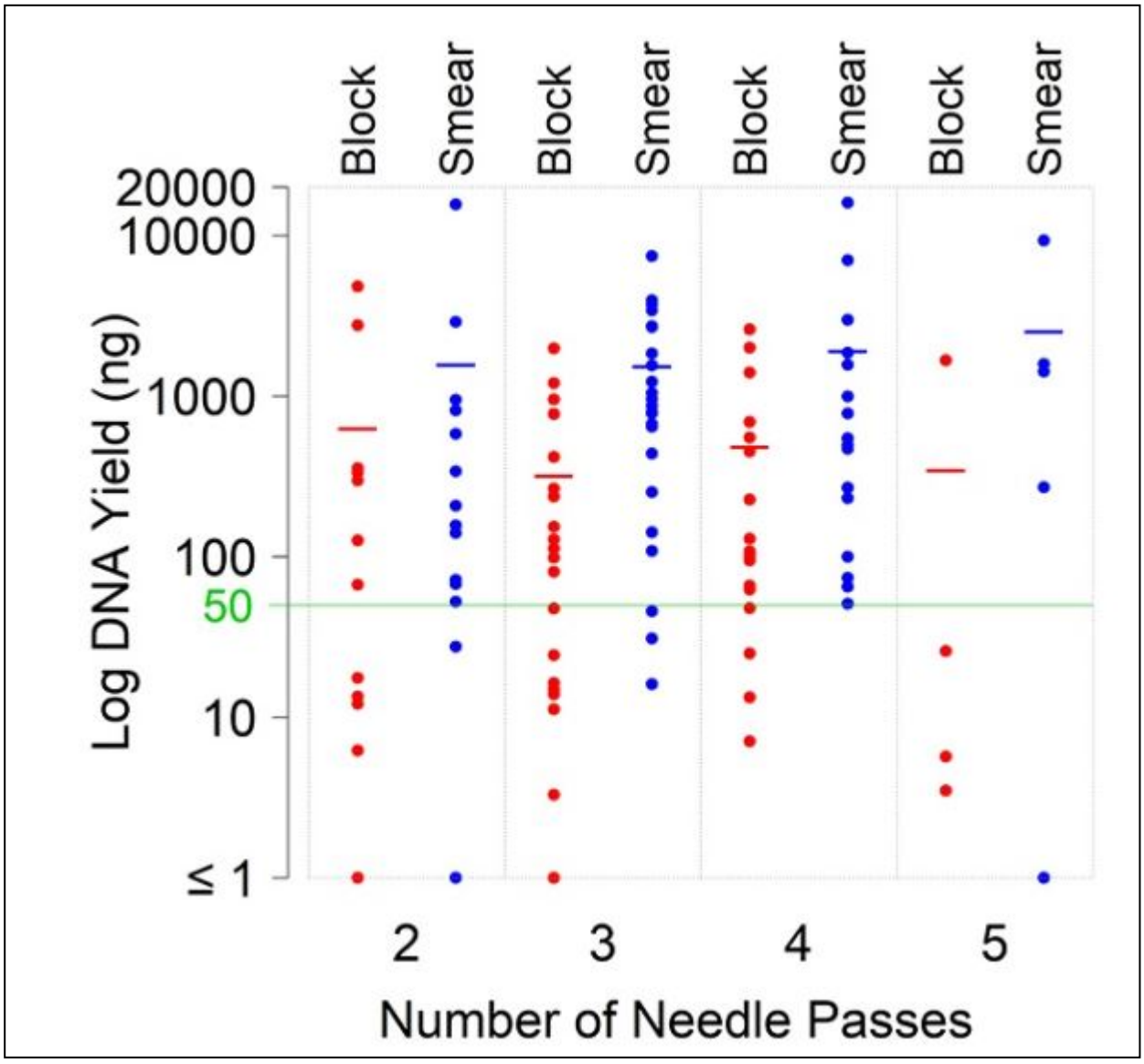

(23) Submission ID#459847

Balloon dilatation of endobronchial stenosis from tuberculosis

Submission Type: Case Report

Submission Status: Complete

Submitter: Arthur Romero – UNLV School of Medicine

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No financial relationships or conflicts of interest.

Interventional Pulmonology

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- No

Background

Endobronchial tuberculosis occurs in up to 40% of patients with pulmonary tuberculosis (TB). Endobronchial stenosis is the most common sequelae and results from fibrous hyperplasia and contracture of the airway. We present a case of TB-related bronchial stenosis treated with balloon dilatation through a flexible bronchoscope.

Case Report

A 38/F presented to the emergency room in Dec 2017 for 3 weeks of worsening dyspnea; no fever, night sweats or cough. She has pulmonary TB diagnosed in Aug 2017. She is compliant with Isoniazid, Ethambutol and Moxifloxacin; she had an allergic reaction to Rifampin. Sputum AFB in Oct 2017 was negative.

On exam, there was no distress, O2 sats 93% on 2 LPM. Absent breath sounds on the left. CXR shows opacification of left hemithorax with mediastinal shift. CT chest shows extensive opacification and volume loss of left hemithorax with bronchiectasis. Bronchoscopy showed left main bronchus obstruction from scarring/fibrotic membrane at 1cm from carina. Also with diffuse mucosal erythema and inflammation. The patient was treated for postobstructive pneumonia and was discharged after 6 days.

She was seen in clinic and therapeutic bronchoscopy was done 2 weeks later. Closer evaluation of the left bronchus obstruction revealed a pinpoint opening (<1mm) at 10 oclock position. A guidewire was advanced into the opening and was met with resistance, bending within stenosed segment under fluoroscopy. A stiffer endoscopy push catheter (O.D. 0.89 mm) was advanced with the guidewire and broke through into distal segments. The stenosed airway and was sequentially dilated to 10mm using a pulmonary balloon. Distal segments were now visualized with purulent secretions, markedly inflamed mucosa and fibrous stranding. AFB cultures from airway washings were negative. Endobronchial biopsies showed fibrotic stroma with acute and chronic inflammation.

The patient felt immediate relief after the procedure. However decreased breath sounds were again noted during a 2-week follow up visit. She was rescheduled for bronchoscopy which showed restenosis of the airway. Balloon dilatation was again done. CXR done at 3 weeks showed well aerated lung without atelectasis.

Conclusion

Bronchial stenosis from endobronchial TB from can be safely treated with balloon dilatation. Other options include stent placement, laser or cryotherapy, or use of a topical chemotherapeutic agent. Incidence of restenosis has been reported to about 37.5% a month after dilatation and is more likely if there is active inflammation or bronchomalacia. The patient should be followed closely and be evaluated for stent placement if stenosis recurs.

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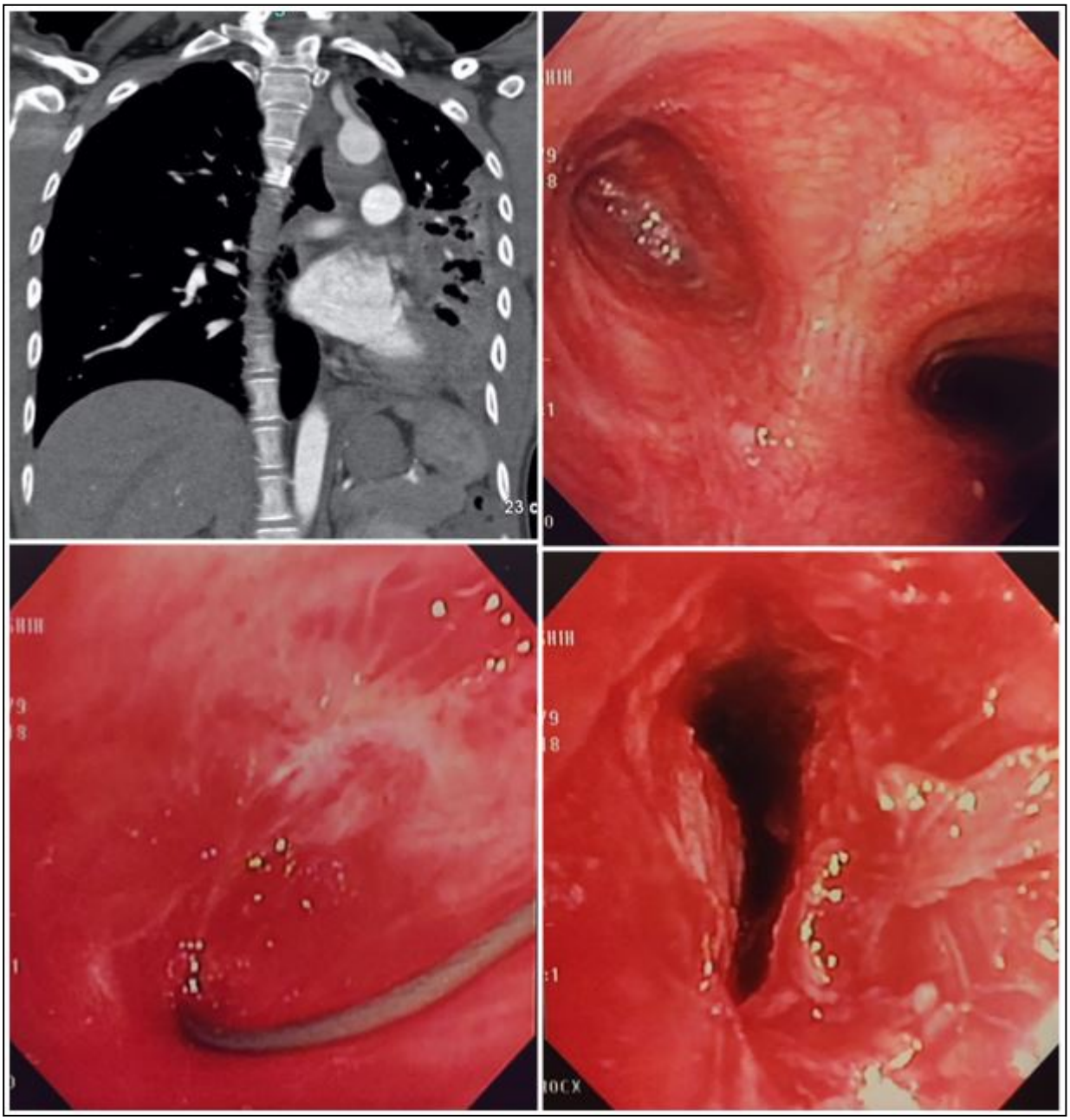

(24) Submission ID#473269

Bilateral Chylothorax with Chylopericardium

Submission Type: Case Report

Submission Status: Complete

Submitter: Rakesh Chawla – RAJIV GANDHI CANCER INSTITUTE

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Chylothorax is the accumulation of chyle in the pleural cavity.1 Chylothorax is suspected when the aspirated pleural fluid appears milky which when kept for sometime forms a creamy layer of chylomicrons. The diagnosis is confirmed by lipoprotein electrophoresis. It will differentiate between chylothorax and pseudochylothorax which contains high content of cholesterol or lecithin globulin complex or both.

Case Report

A 35-year-old male patient presented with complaints of breathlessness and left-sided chest pain of five days duration. Physical examination revealed a left-sided massive pleural effusion, right-sided moderate pleural effusion and pericardial effusion. Laboratory examination revealed a high triglyceride content in the pleural

and pericardial fluids suggestive of chylous pleural effusion and chylopericardium. Further investigations confirmed the diagnosis of malignant lymphoma (thymic large B-cell lymphoma). The report was confirmed with immunohistochemistry markers, by tru-cut biopsy from mediastinal mass.

Conclusion

Bilateral chylothorax with chylopericardium is a rare entity and this condition secondary to lymphoma has a poor prognosis. Diagnostic dilemma remained in our case inspite of all investigations, like thoracoscopic pleural biopsy, lymphnode FNAC, bronchoscopy with BAL. In our case diagnosis was established to be thymic B-cell lymphoma on CT-guided tru-cut biopsy from the mass lesion.

(25) Submission ID#458959

Broncholithoptysis as a Presentation of Broncholithiasis Causing Bronchial Obstruction

Submission Type: Case Report

Submission Status: Complete

Submitter: Christopher Radchenko – Virginia Commonwealth University

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Disclosure: Nothing to Disclose
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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Broncholithiasis is a phenomenon described in the literature; it is used to denote the presence of calcified and ossified material within the lumen of the tracheobronchial tree. Most commonly, it is associated with chronic granulomatous lymphadenitis, although other causes exist. Broncholithiasis can cause symptoms that may masquerade as those seen in other pulmonary diseases, thus leading to unnecessary diagnostic studies as well as potentially harmful therapies. Broncholithoptysis, or expectoration of a broncholith, has been noted as a consequence of broncholithiasis, however this is rarely reported in the literature. Recognizing this presentation allows clinicians effectively evaluate and treat potential complications of broncholithiasis.

Case Report

67-year-old male, previously evaluated for chronic cough, worsening dyspnea associated with persistent wheezing, which had been progressive for the past year. He was started on bronchodilator/corticosteroids combination inhalers as well as mepolizumab therapy, with notable worsening of symptoms. Previous chest computed tomography showed significant mediastinal and hilar lymph node calcifications. After an episode of persistent coughing, he expectorated a single stone, approximately the size of a pea for which he was seen by his dentist who did not find any missing or fractured teeth. Repeat imaging showed near complete obstruction of the bronchus intermedius secondary to a large calcified subcarinal lymph node, which had eroded through the medial aspect of the bronchial intermedius. The broncholith measured approximately 30 x 13 mm on axial computed tomography. Given the dimensions and structural configuration of the broncholith, the patient was being considered for pneumonectomy. Employing rigid bronchoscopy with cupped forceps, rigid suction, as well as a retrieval net device, the broncholith was removed in fragments. Careful extraction with close attention paid to prevent distal showering of calcified fragments was undertaken. The patency of the bronchus intermedius was completely restored, with a clear visible communication to the mediastinum, where the broncholith had originated. Granulation tissue was seen within the bronchus as a reaction to a foreign body. Immediately following the procedure, the patient had remarkable improvement in symptoms. There was resolution in the severity of his cough, as well as wheezing.

Conclusion

Broncholithoptysis is a symptom perplexing to patients, and under recognized by clinicians. However, it may be a prelude to more severe complications including obstructive bronchopneumopathy. Patients will often be treated for alternative pulmonary diagnoses; meanwhile their risk of broncholith-related complications escalates. Increasing clinicians awareness of broncholithoptysis will allow patients to be evaluated and treated in a safer and more expedited manner.

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(26) Submission ID#459494

Bronchoscopic Cryotherapy for Children with Tracheobronchial Tuberculosis in 3 Typical Cases and Review of Literature

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Leping Ye – Division of Pediatric Pulmonology, Department of Pediatrics, Peking University First Hospital, No.1 Xi'an Men Street, West District, Beijing

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

To observe the clinical manifestations, imaging findings, bronchoscopic findings and pathological features of children with tracheobronchial tuberculosis thus exploring the possible treatment and improving the clinician's understanding of this disease.

Methods

The clinical data of 3 children with tracheobronchial tuberculosis diagnosed by bronchoscopic biopsy from January 2014 to December 2017 in the Second Affiliated Hospital and Yuying Childrens Hospital of Wenzhou Medical University and Peking University First Hospital were retrospectively analyzed. The clinical manifestations, bronchoscopic findings, pathologic features, drug therapy and interventional therapy were summarized.

Results

Among the 3 pediatric patients, there were 0 male and 3 females, aged 1-11 years old. Meanwhile, a total of 5 documents were retrieved, 85 patients with tracheobronchial tuberculosis were treated with bronchoscopy. Above all, their main clinical manifestations were cough, fever and wheezing. The clinical manifestations were atypical. So bronchoscopy was the standard of diagnosis, Most patients with chemical drugs and bronchoscopy interventional treatment were improved obviously, especially with cryotherapy. 3 cases of our paper with anti-TB drug treatment and cryotherapy were also improved.

Conclusions

The clinical manifestation and imaging changes of pediatric tracheobronchial tuberculosis are atypical and the misdiagnosis rate is extremely high, bronchoscopy is the standard of its diagnosis. Further more, chemotherapy combined with bronchoscopy cryotherapy can safely and effectively reduce tracheal stenosis in children and improve the prognosis.

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(27) Submission ID#459022

Bronchoscopic Grafting of Tracheobronchial Defects

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Amit Tandon – Henry Ford Hospital

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Role: Presenting Author

Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Complete injury to the tracheobronchial tree may develop after lung resection, lung transplantation, non-surgical treatment of thoracic malignancies, and trauma. This complication presents with varying frequency (1-20%) depending on the type of surgery, closure technique, adjuvant treatments and patient baseline characteristics. The mortality, depending on the etiology, remains high. Surgical repair remains the treatment of choice for most cases of airway injury. For patients who are not surgical candidates however, conservative approaches which include bronchoscopic techniques are considered viable options. These include bronchoscopic placement of atrial septal defect (ASD) closure devices, airway stents, instillation of silver nitrate, fibrin glue, cyanoacrylate and others. Alloderm (LifeCell) is an acellular dermal matrix (ADM) used for grafting in orofacial, abdominal and thoracic surgery. It is biocompatible and has the potential to integrate with human tissue while resisting infection and adhesion formation. Bronchoscopic use of ADM for airway defects is sparsely reported in the literature.

Methods
We performed a retrospective analysis of our experience with airway grafting to correct large airway defects including BPF, TEF, transplant complications and traumatic airway injury. The technique used includes bronchoscopic instillation of fibrin glue, followed by placement of an ADM patch, and airway stenting via rigid bronchoscopy to hold the graft in place and maintain closure of the defect.

Results
Airway grafting was attempted in 43 patients. Thirty-three men (77%) and ten women (22%), median age was 63 (range 35-86). The underlying mechanism of airway defect was surgical lung resection (35%), lung transplant (7%), related to malignant disease (tumor invasion 14%, external beam radiotherapy 47% and esophagectomy 14%) and trauma (5%). The technique was completed in 37 patients (86%). Five cases were not completed due to difficulty instilling fibrin glue and one due to difficulty with stent deployment. There were no immediate deaths related to the procedure. Closure of the airway defect was documented bronchoscopically in ten patients (23%) at 60 days. Fifteen patients (35%) died at 28-days, eleven due to overwhelming sepsis and respiratory failure, one due to massive hematemesis and three due to unknown reasons. Ten patients (23%) had procedure-related complications at 60 days (extension of the fistula 5, patch migration 4 and stent migration 1).

Conclusions
The use of bronchoscopic grafting of airway defects using airway stents, fibrin glue and ADM is feasible and may be considered an option for patients who are not surgical candidates.

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Image or Table

Row A: Stump Dehiscence
Row B: Anastomotic Dehiscence
Row C: Bronchoesophageal Fistula

Powerpoint Upload

Endobronchial Grafting WABIP.ppt

(28) Submission ID#407530

Bronchoscopic Management of Airway Obstruction from Blood Clots: A Case Series

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Akash Verma – Tan Tock Sneg Hospital, Singapore

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

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- Yes

Background
Blood clot formation in the airways can cause acute central airway obstruction (CAO) resulting in hypoxia and cardiac arrest. Prompt extraction of such clots is essential. We describe our experience of managing respiratory failure and cardiac arrest caused by CAO from such blood clots.

Methods
A prospective evaluation of patients referred for CAO from blood clots at a tertiary centre between July 2014 and June 2017.

Results
Ten patients were managed for CAO from blood clots. Six were females. Median (range) age was 54.5 (35-79) years. The trigger for airway bleeding and subsequent clot formation was recent coagulopathy alone (n=4), recent tracheostomy alone (n=4), and both recent coagulopathy and tracheostomy (n=2). In those with coagulopathy (n=6), 3 had thrombocytopenia, and 5 were receiving low molecular weight heparin or unfractionated heparin prior to onset of bleeding for cortical venous sinus thrombosis, pulmonary embolism, ST-elevation myocardial infarction, pulmonary vein thrombosis, and prophylaxis of deep vein thrombosis. In those undergoing tracheostomy (n=6), the indication were poor conscious level after cortical venous sinus thrombosis (n=1), prolonged mechanical ventilation (n=2), progression of nasopharyngeal carcinoma (n=1), tongue cancer (n=1), and pneumonia in a patient with history of tetraplegia from road traffic accident (n=1). Clots were extracted using flexible alligator biopsy forceps brochoscopically. Median (range) duration of bronchoscopy was 2.25 (0.67-3.75) hours. A significant improvement in the PaO2:FiO2 ratio was seen in all patients immediately after clot extraction with median PF ratio before and after clot extraction being 103.5 (29-204) vs. 289 (200-386), p=0.001. Seven patients sustained cardiac arrest from CAO from blood clots of which 3 died with overall mortality of 30%, whereas mortality in those sustaining cardiac arrest was 3/7 (43%).

Conclusions

Flexible alligator biopsy forceps via flexible bronchoscopy is safe, effective, and adequate technique for extraction of blood clots from the airways originating either in the lungs or from blood tracking down from tracheostomy site.

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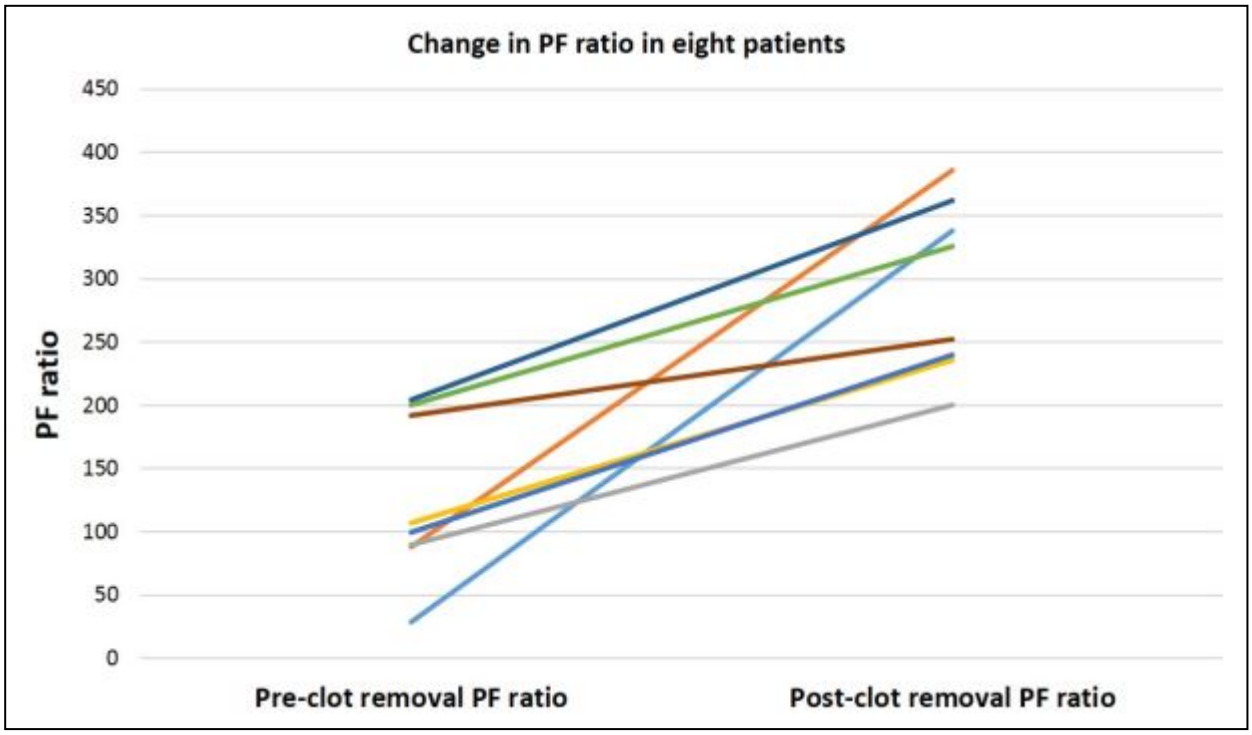

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(29) Submission ID#459004

Bronchoscopic management of benign post intubation tracheal stenosis- 40 procedures in 21 patients

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Vallandramam Pattabhi Raman – Royal Care Super Speciality Hospital

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Benign tracheal stenosis (BTS) often presents, as a medical emergency. Rigid bronchoscopic intervention is essential for immediate relief as well as long-term management of these patients. The aim of this study is to report our experience and follow up of such interventions.

Methods
We performed a retrospective analysis of medical records of all patients who were managed bronchoscopically for BTS at our center.

Results
40 procedures were performed in 21 patients (mean 1.9/patient); there were 11 female and 10 male patients with mean age of 33.61 years. BTS was due to Post Resection Tracheal Stenosis (PRTS) in three and Post Intubation Tracheal Stenosis (PITS) in 18 patients. Position of tracheal stenosis was sub-glottic in 6 (28.5%), mid-tracheal in 12(57.1%) and distal tracheal in 3(14.4%). 4 of the PITS (19.04%) were membranous and were managed with balloon dilation (5 procedures, average 1.2/patient) and remained asymptomatic at mean follow up of 43 months (range 2-99 months). 18 patients (15 patients with complex PITS and 3 PRTS) underwent silicone stent placement (12 straight stents and 6 Montgomery T tube). 4 (22.2%) stents were removed due to poor tolerance and granulation. 3 of the stents were removed, two were reinserted due to recurrence and one patient remained symptom free after 51 months. 13 patients (72.2%) have stent in-situ with an average duration of 23.3 months (range 2-48 months) with no major complications.

Conclusions
Bronchoscopic interventions play a major role in management of patients with BTS. They can provide good alternative to surgery in patients who are unfit, unwilling or in absence of an expert surgeon.

(30) Submission ID#475835

Case Report: Novel Use of iCAST Stent for Refractory Drainage of Right Upper Lobe Infected Tumor

Submission Type: Case Report

Submission Status: Complete

Submitter: Janani Reisenauer – Interventional Pulmonary medicine, Mayo Clinic

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Background
Endoscopic pigtail drainage has been previously reported for management of pulmonary abscesses resistant to long-term antibiotic therapy. We describe a novel technique of lobar stenting for internal drainage of a refractory infected tumor abscess.

Case Report
A 29 year old male with diffuse B cell lymphoma on chemotherapy developed recurrent febrile pneumonias requiring 3 hospital admissions and multiple rounds of intravenous and oral antibiotics He presented once again with a febrile episode and had a pigtail catheter inserted into a tumor abscess in the right upper lobe (RUL) (Figure 1A). The pigtail catheter provided limited drainage of the abscess cavity. The only surgical option was a pneumonectomy on cardiopulmonary bypass with muscle flap and an open chest wall. A stent to the RUL to facilitate drainage was proposed.
One cc of 10mg/mL methylene blue diluted in 29 cc of normal saline was instilled through the previously existing thoracostomy tube with adequate localization to the anterior segment of the RUL. The patient was intubated with a rigid bronchoscope for optimal airway management. . A 6-mm x 22-mm iCAST (ATRIUM, Maquet Getinge Group, NH, USA) balloon-expandable stent was deployed into the RUL through the working channel of a T180 bronchoscope (Olympus Medical Systems Corp., Tokyo, Japan) (Figure 1B). Contrast bronchogram demonstrated adequate position and the XP190 bronchoscope (Olympus Medical Systems Corp., Tokyo, Japan) was then passed through the stent to adequately visualized the thoracostomy tube (Figure 1C-D). The distal end of the stent was then dilated to 7 mm with a ChargerTM Balloon (Boston Scientific Corporation, Boston, USA) to flare the proximal end of the stent.
The patient required one stent exchange with an 8 mm x 39 mm iCAST stent due to proximal migration. He has since resumed chemotherapy with no episodes of pneumonia at 3 months. Computed tomography demonstrated the stent was in excellent position with no evidence of cross-contamination to the unaffected lobes or left lung. The patient is currently being considered for chimeric antigen receptor T-cell therapy.

Conclusion
Lobar stenting appears to be one potential treatment modality for recurrent pulmonary abscess. However, this should be reserved for patients whom goal directed antibiotic therapy or surgical options are exhausted. Further investigations are warranted to determine exact indications for the procedure.

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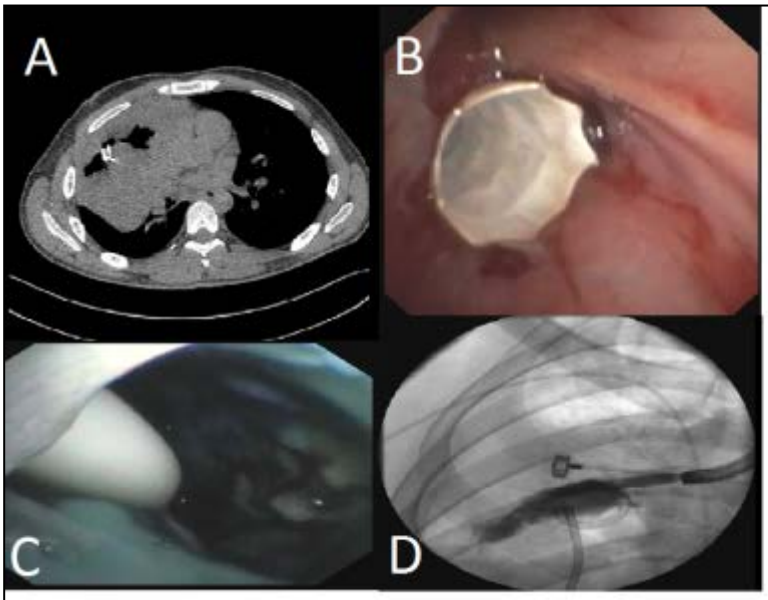
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(31) Submission ID#457896

Choice of bronchoscopic intervention working channel for airway disease: rigid bronchoscope, laryngeal mask, endotracheal intubation, or a combination?

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Bronchoscopic technique has made advances and plays an increasingly important role in the treatment of airway disease. The choice of the appropriate working channel for the procedure has become a focus of attention. However, few large-sample studies have examined the indications, advantages, disadvantages, and complications associated with different working channels. We report our 13 years of experience with bronchoscopic intervention in patients with airway disease at our hospital.

Methods
We retrospectively analyzed the clinical data from 767 patients with airway disease who underwent bronchoscopic intervention, and focused on the indications, advantages, disadvantages, and complications associated with use of different working channels.

Results
Of 1,200 bronchoscopic interventions in 767 patients, 971 were completed using only one working channel, and 229 were completed with a combination of working channels. There were no significant differences in rates of effectiveness. The incidence of complications was 11.6% (139/1,200), and the mortality was 0.3% (4/1,200). Complications include hypoxemia, CO2 retention, arrhythmia, cardiac arrest, airway mucosal tears, glottis edema, vocal cord injury, loss of teeth, massive hemorrhage, pneumothorax, thyroid pneumatosis, pneumonia, and death. The incidence of complications using different working channels is shown in Table. Most of the complications were related to operative procedures, but there was no obvious association with the working channel itself.

Conclusions
In our experience, rigid bronchoscope can be used for a variety of interventions for almost all central airway lesions below the upper trachea. However, the technical requirements for the operator and anesthesiologist and the complications associated with rigid bronchoscope limit its use. A laryngeal mask can be used as a working channel to complete most bronchoscopic interventions. The technical requirements are relatively limited, with less procedural difficulty and fewer complications. In particular, the ability to treat subglottic lesions is a significant advantage. The lumen of endotracheal intubation is too small to provide enough space for operative procedure sometimes, moreover, the relatively few operating instruments are not conducive to treatment of special airway lesions, such as larger tumors, larger endobronchial calculis and larger foreign

bodies. However, ventilation is highly effective, the procedure is safe, and there are few complications. Therefore, the choice of working channel should be based on the pathology, location and severity of the lesion, and the operative procedure. For some complex airway lesions, a combination of multiple working channels is required to maximize the efficacy.

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Image or Table

Table . The incidence of complications of different working channel in bronchoscopic intervention

Complications	EI n (%)	LM n (%)	RB n (%)	EI+LM n (%)	EI+RB n (%)	LM+RB n (%)
Hypoxemia	0 (0.0)	3 (0.5)	12(9.6)	0 (0.0)	2 (3.9)	2 (1.4)
CO_2 retention	0 (0.0)	2 (0.4)	6(4.8)	1 (2.9)	4 (7.8)	4 (2.8)
Arrhythmia	0 (0.0)	1 (0.2)	3(2.4)	2 (5.9)	2 (3.9)	2 (1.4)
Cardiac arrest	0 (0.0)	1 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Airway mucosal tears	0 (0.0)	0 (0.0)	1 (0.8)	0 (0.0)	0 (0.0)	1 (0.7)
Glottis edema	0 (0.0)	34 (6.1)	20 (16)	0 (0.0)	5 (9.8)	6 (4.2)
Vocal cord injury	0 (0.0)	0 (0.0)	2(1.6)	0 (0.0)	1 (2.0)	2 (1.4)
Loss of tooth	0 (0.0)	0 (0.0)	2 (1.6)	0 (0.0)	1 (2.0)	1 (0.7)
Massive hemorrhage	2 (0.7)	1 (0.2)	1 (0.8)	0 (0.0)	1 (2.0)	0 (0.0)
pneumothorax	0 (0.0)	0 (0.0)	1 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)
Thyroid pneumatosis	0 (0.0)	0 (0.0)	1 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)
Pneumonia	0 (0.0)	2 (0.4)	1 (0.8)	0 (0.0)	1 (2.0)	1 (0.7)
Death	1 (0.4)	1 (0.2)	1 (0.8)	0 (0.0)	0 (0.0)	1 (0.7)
Total	3 (1.1)	45 (8.0)	51(40.8)	3 (8.8)	17(33.3)	20 (13.9)

EI: endotracheal intubation; LM: laryngeal mask; RB: rigid bronchoscope

(32) Submission ID#457675

Choice of bronchoscopic intervention working channel for benign central airway obstruction

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Compared with malignant airway obstruction, benign airway obstruction is more complicated as patients have a longer survival time and higher requirements for maintaining the quality of life. While bronchoscopic intervention has become the main treatment for benign central airway obstruction, the choice of working channel and related postoperative complications have become a focus of attention. The purpose of this study is to report our experiences over 12 years.

Methods
We retrospectively analyzed the clinical data from 273 patients with benign central airway obstruction who underwent a bronchoscopic intervention through rigid bronchoscope, laryngeal mask, or endotracheal intubation. The Wilcoxon rank-sum test was used to analyze the immediate results after the bronchoscopic intervention, and the chi-square test was used to analyze the correlation between glottic edema and operation time.

Results
The 273 patients underwent a total of 479 bronchoscopic interventions, with satisfactory results. The immediate effective rates of the bronchoscopic intervention by rigid bronchoscope, laryngeal mask, and endotracheal intubation were 91.4%, 91.3%, and 85.2%, respectively. Postoperative complications related to the working channels included hoarseness, glottic edema, pharyngalgia, paresthesia pharynges, cough, and tooth loss. Glottic edema is the most serious complication, and only appeared in the laryngeal mask and rigid bronchoscope groups. The operation time of the patients with glottic edema was significantly longer than the average operation time of the patients in these groups (95.0±25.0 minutes versus 70.0±25.0 minutes, $Z=-5.44$, $p<0.01$). Five patients with glottic edema needed an emergency endotracheal intubation to treat asphyxia. We found a significant correlation between the incidence rate of glottic edema and the operation time (Table). We also observed that compression of the rigid bronchoscope to the pars membranacea of the trachea could easily cause necrotic tissue in this area following the operation. If necrotic tissue blocks the

lumen, patients may experience dyspnea and even suffocation a short time after the bronchoscopic intervention.

Conclusions

All three working channels, including rigid bronchoscope, laryngeal mask, and endotracheal intubation, can rapidly relieve symptoms of airway stenosis as bronchoscopic interventions for benign central airway obstruction. The choice of the correct working channel during an operation should be made on the basis of the operation procedure, location of the lesions, and pathology of the patients. Any related postoperative complications should be fully assessed before the operation. For the prevention of glottic edema, it is important to improve the technical-skill level of operators to shorten the procedure time.

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Table. The relation between the incidence rate of glottic edema and the operation time

Operation time (minutes)	Glottic edema		No glottic edema		Total		χ^2	P
	number	%	number	%	number	%		
<60	7	12.7	81	24.4	88	22.7		
60-90	19	34.5	223	67.2	242	62.5	73.71	<0.01
>90	29	52.7	28	8.4	57	14.7		
Total	55	100.0	332	100.0	387	100.0		

(33) Submission ID#459002

Comparing the use of the 19-Gauge and the 21 or 22-Gauge Aspiration Needle in Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration (EBUS-TBNA) in diagnosing mediastinal or hilar lesions and lymphadenopathy

Submission Type: Oral and Poster
Submission Status: Complete
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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive procedure used to obtain tissue samples to evaluate mediastinal or hilar lesions. This is conventionally done using the 21 or 22 Gauge (G) needles. The recent introduction of the EBUS 19 G needle allows larger samples to be obtained, overcoming limitations with the use of 21 or 22 G needles. The study aims to compare the diagnostic yield, sample adequacy for further histopathological and molecular characterisation

and complication rates.

Methods
This is a retrospective study involving 50 EBUS-TBNA cases conducted at a thoracic procedure suite at a university teaching hospital in South Australia between June 2016 and August 2017. Biopsies were obtained by using either a 19 G, 21 G or 22 G needles during linear EBUS. Information was collected which included the patients demographic data, diagnosis, sample adequacy for immunohistochemistry and molecular mutation testing, sample quality and procedure complications.

Results
The diagnostic yield was 96% with 19 G needle compared with 88% with the 21 or 22 G needle (p=0.61). Sample adequacy for immunohistochemistry (IHC) testing could be performed in 91% of patients in the 19 G needle compared to 56% of patients with the 21 or 22 G needle (p=0.049). In both groups, molecular mutation testing was achieved in 100% of patients with primary lung adenocarcinoma. Five patients (20%) in 19-G needle group developed moderate bleeding compared to one patient (4%) in the 21 or 22-G group (p=0.19).

Conclusions
The diagnostic yield, sample adequacy for molecular mutation testing was comparable between the 19 G and 21 or 22 G needles in EBUS-TBNA. Moderate bleeding rate was comparable between the groups. In this study, sample adequacy for immunohistochemistry was significantly better with the 19 G needle. Further research is needed to establish the advantages of 19 G aspiration needle in EBUS-TBNA.

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(34) Submission ID#420692

Comparison between transverse and vertical skin Incision in percutaneous dilatational tracheostomy

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Young-Jae Cho – Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Seoul National University Bundang Hospital

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Percutaneous dilatational tracheostomy (PDT) is a common procedure in the critical care medicine. In PDT operations, vertical skin incision has been traditionally used as it can be easily converted to open tracheostomy in emergent cases and is less likely to injure adjacent structures. However, for open tracheostomy, surgeons typically use a transverse skin incision, which allows for improved healing and more aesthetic outcome than vertical incisions. The objective of this study was to compare the outcomes of transverse and vertical skin incision in patients undergoing PDT.

Methods
Patients who underwent PDT between March 2011 and December 2015 in the intensive care unit (ICU) of a tertiary hospital were included in this retrospective study. PDTs were performed by pulmonologists at the ICU bedside using the single tapered dilator technique assisted by flexible bronchoscopy. The primary outcome was the early complications developed within 7 days after PDT.

Results

Of the 553 patients who underwent PDT, vertical incisions were performed in 33.5% and transverse incision in 66.5%. There were no tracheostomy-related mortalities, and no statistical difference in the incidence of the perioperative complications including bleeding, tracheal ring fracture, and subcutaneous emphysema. Forty-six patients (8.3%) had early complications. The most frequent early complication was pressure related tracheostomy ulcer, and transverse skin incision allowed for a lower incidence of early complications (14.1% vs 5.4%, $P<0.05$).

Conclusions

In PDT operation, transverse skin incision clearly resulted in a significant decrease in early complications particularly stoma pressure ulcer.

(35) Submission ID#459653

Comparison of 3D printed stenotic airway model versus Standard Model for Bronchoscopy training - a proof of concept

Submission Type: Oral and Poster
Submission Status: Complete
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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Many pulmonary training programs use high-cost models that lack the accuracy of subtle anatomical details of a normal airway and have an absence of pathological airway models. We aimed to evaluate an innovative, low-cost 3D printed stenotic airway model to teach bronchoscopic procedures such as airway inspection, balloon dilatation and stent placement.

Methods
A 3D digital model of a tracheobronchial tree with a focal left mainstem bronchus stenosis was generated from a chest CT scan (3D Slicer, slicer.org). The model mold was printed using fused deposition (Taz 6, Lulzbot) with a polyvinyl alcohol(PVA) dissolvable inner core and polylactic acid (PLA) outer shell. Injection molding technique was used to create a flesh colored silicone airway(EcoFlex 00-10, Smooth-On; Silc Pig, Smooth-On). The silicone airway was then immersed in water in order to dissolve the PVA inner core and attached to a Broncho-Boy(CLA) intubation head with 3D printed adapter. Participants with different levels of training (general pulmonologist, pulmonary fellows and Interventional Pulmonology (IP) attendings) performed bronchoscopy on the stenotic airway model and compared it with a convention model (Broncho-Boy, CLA) for bronchoscopy training and with their previous experience with patients. We evaluated airway inspection, stent placement and overall experience using questionnaires with categorical variables. Our questionnaire was exempted by the institutional review board.

Results
Eight participants were surveyed on the models: 5 general pulmonologists, 1 second year pulmonary fellow and 2 interventional pulmonology faculty. All had performed more than 100 flexible bronchoscopies, 7 had previously treated patients with airway stenosis and 5 placed at least 10 stents previously. Half of the participants felt that the 3D model was better for airway inspection. More participants felt than the 3D model was very realistic for stent insertion compared to the standard model (5 vs 1). All participants rated the simulation experience as very good or excellent. All participants thought that the 3D model would improve their skills on stent placement. 6 participants felt more or much more confident in self expanding metal stent placement after simulation with the 3D model.

Conclusions
3D printed airways using pathological cases may provide a more realistic experience and is an alternative way for teaching therapeutic bronchoscopic techniques in complex airways. The low cost and the ability to recreate different lesions are advantages of this new education model.

(36) Submission ID#454893

Comparison of clinical outcomes of silicone stent and fully covered metallic stent in malignant central airway stenosis

Submission Type: Oral and Poster
Submission Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Airway stenting to restore the patency of the airways in malignant central airway obstruction (CAO) is the most effective palliation for patients with disabling symptoms of dyspnoea. Our goal was to compare Aerstent and Dumon stents in patients with malignant CAO, focusing on outcome and stent-related complications.

Methods
All patients who had been treated with a Dumon or a fully covered metallic Aerstent stent for five years (August 2012 to July 2017) at the Interventional Pulmonology Unit in the Hospital Universitari of Bellvitge were retrospectively reviewed. Patients with benign histopathology or fistula were excluded. Survival analysis was divided into patients with lung cancer and lung metastases from other primary. Complications were assesed during bronchoscopy follow up. Mucus retention, granulation tissue, migration, metal fracture and silicone detachment/perforation were registered. Comparison of survival and complications is presented with hazard ratio adjusting by patients at risk at each time.

Results
A total of 103 stents were placed in 92 patients with malignant CAO. All stents were placed under rigid bronchoscopy and reopening of the airway was achieved for all patients. Both stents were removed successfully if necessary. Similar survival was found for both stents in patients with lung metastases HR IC[95%]: 1.9 [0.7;5.1], p= 0.23. Patients with lung cancer and Dumon had better survival HR IC[95%]: 1.8 [1;3], p= 0.04 because they had stent earlier during their disease and received adjuvant chemo (64.9% referred at diagnosis of cancer versus 46.3% in the Aerstent group). 72.5% Dumon and 73% Aerstent stents had at least one bronchoscopy follow up. A mean of 2 bronchoscopies were performed. In the first month, probability of at least one stent related complication was 37.9% for Dumon and 40.4% for Aerstent and after 6 months it was 94.3% patients with Dumon and 97.9% patients with Aerstent (HR IC[95%]: 1.5 [0.9;2.3], p= 0.11). Aerstent had an increased risk of mucus retention (HR IC[95%]: 1.7 [1;2.9], p= 0.04) compare to

Dumon. No differences were seen for granulation tissue incidence and migration incidence (Table1). Aerstent had no metallic fracture, neither spontaneous nor during retrieval. 21.3% of Aerstent had silicone coat detachment or perforation.

Conclusions

Both stents were successful in restoring airway patency and were removed successfully when necessary. Survival was better in patients with adjuvant treatment. Probability of any stent related complication after 6 months was 94.3% with Dumon and 97.9% with Aerstent. Aerstent had increased risk of mucus retention and didn't have metallic fracture.

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Image or Table

	DUMON	AERSTENT	
			Hazard Ratio
Mucus retention			1.7 [1;2.9], p=0.04
1 month	21.40%	30.90%	
3 months	70.50%	90%	
6 months	70.50%	93.40%	
Granulation tissue			0.9 [0.5;1.8] p=0.76
1 month	18.90%	10%	
3 months	49.40%	52.40%	
6 months	68.40%	63%	
Migration			2.2 [0.4;11.6] p=0.36
1 month	7.10%	9%	
3 months	7.10%	11.60%	
6 months	7.10%	19%	

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(37) Submission ID#429233

Comparison of CT-Guided, Conventional Transbronchial, and ENB-Guided Biopsy for Diagnosing Lung Cancer: Initial Experience from Singapore

Submission Type: Oral Presentation ONLY

Submission Status: Complete

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Interventional Pulmonology

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- No

Background
The highest mortality rate of lung cancer among all cancers is attributed to diagnosis in late stages. Hence lung cancer presenting as a nodule lends the best opportunity for cure. The currently practiced non-surgical approaches for sampling the peripheral lung nodules are; CT-guided percutaneous biopsy, conventional transbronchial biopsy, and guided bronchoscopy with the aid of virtual bronchoscopy (VB), radial probe endobronchial ultrasound (radial-probe EBUS), or electromagnetic navigation (ENB). After starting the service of electromagnetic navigation bronchoscopy (ENB) at our centre, we did this study to evaluate its performance for diagnosing malignancy, compared to CT-guided biopsy and conventional bronchoscopy.

Methods
Ninety two patients undergoing diagnostic evaluation of peripheral lung nodules by CT-guided biopsy, conventional bronchoscopy or ENB guided biopsy in 2017 were studied prospectively. ENB was done without thin computed tomography (CT) slice, rapid onsite evaluation (ROSE), radial-probe endobronchial ultrasound (EBUS), or use of needle for obtaining tissue.

Results
Of 92 patients undergoing diagnostic evaluation of lung nodules, 30 underwent CT-guided biopsy, 39 conventional bronchoscopy, and 23 underwent ENB guided biopsy. The sensitivity, specificity, accuracy, positive predictive value, and negative predictive value for malignancy with ENB was 71.4%, 100%, 82.6%, 100%, and 69.2% respectively, compared to 94.7%, 100%, 96.6%, 100%, and 91.6% for CT-guided biopsy, and 66.6%, 100%, 89.7%, 100%, and 87.1% for conventional bronchoscopy. The diagnostic yield of malignancy in patients with nodule size 2 cm and > 2 cm was 85.7 (42.1-99.6), 0, 100 (15.8-100) vs. 100 (73.5-100), 80 (44.3-97.4), and 66.6 (34.8-90.08) in the CT-guided biopsy, conventional bronchoscopy, and ENB guided biopsy group. Overall diagnostic yield for CT-guided biopsy, conventional bronchoscopy, and ENB guided biopsy was 76.6%, 58.9%, and 52.1% respectively. CT-guided biopsy was associated with significantly high rate of pneumothorax (36.6%) and unplanned resource utilization compared to conventional bronchoscopy and ENB guided biopsy (p=0.001).

Conclusions
For diagnosing lung cancer, ENB alone under fluoroscopy, without the use of thin CT slice, needle technique, ROSE, or radial-probe EBUS, was superior to conventional bronchoscopy in terms of diagnostic yield, and CT-guided biopsy in terms of safety and resource sparing effect. Further studies are required on diagnostic

yield of ENB after combining it with multiple modalities at the same time.

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Image or Table

Table 1. Nature of disease (malignant vs. benign) related diagnostic yield (n=92)

	Malignancy (n=45)				
	Sensitivity (95%CI)	Specificity (95%CI)	Accuracy (95%CI)	PPV (95%CI)	NPV (95%CI)
CT-guided	94.7 (73.9-99.8)	100 (71.5-100)	96.6 (82.7-99.9)	100	91.6 (62..0-98.6)
TBLB	66.6 (34.8-90)	100 (87.2-100)	89.7 (75.7-97.1)	100	87.1 (75.2-93.7)
ENB	71.4 (41.9-91.6)	100 (66.3-100)	82.6 (61.2-95.0)	100	69.2 (49.5-83.7)
	Benign (n=47)				
	Sensitivity (95%CI)	Specificity (95%CI)	Accuracy (95%CI)	PPV (95%CI)	NPV (95%CI)
CT-guided	45.4 (16.7-76.6)	100 (82.3-100)	80 (61.4-92.2)	100	76 (64.8-84.4)
TBLB	53.5 (33.8-72.4)	81.8 (48.2-97.7)	61.5 (44.6-76.6)	88.2 (67.1-96.4)	40.9 (29.8-52.9)
ENB	22.2 (2.8-60)	100 (76.8-100)	69.5 (47-86.7)	100	66.6 (58.5-73.9)

TBLB: conventional transbronchial lung biopsy; ENB: electromagnetic navigation bronchoscopy; PPV: positive predictive value; NPV: negative predictive value

(38) Submission ID#471466

Comparison of PD-L1 immunohistochemical staining between EBUS-TBNA and resected lung cancer specimens.

Submission Type: Oral and Poster
Submission Status: Complete
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Interventional Pulmonology

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Background
Programmed death ligand-1 (PD-L1) expression via immunohistochemistry (IHC) is used as a biomarker to assess whether a patient with advanced non-small cell lung cancer (NSCLC) is eligible for various anti-PD-1/PD-L1 immunotherapies. In advanced NSCLC, small biopsy specimens from endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) are often the only available material from cancer tissue for the analysis of PD-L1 expression. We aim to assess the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of PD-L1 expression at 1% and 50% on EBUS-TBNA samples compared with their corresponding surgically resected tumor specimens.

Methods
We retrospectively reviewed the medical records of all patients who underwent EBUS-TBNA followed by surgical resection of NSCLC between the dates of July 2006 and September 2016. Basic demographic information and peri-procedural/surgical data were collected. The archived specimens were retrieved and assessed for PD-L1 expression. A positive PD-L1 stain was defined using two separate cutoff points: 1% and 50% of tumor cell positivity. EBUS-TBNA aspirates were compared with the surgically resected specimen to calculate the sensitivity, specificity, PPV, and NPV.

Results
Sixty one patients were included. At a PD-L1 cutoff of 1%, the sensitivity, specificity, PPV, and NPV were

72%, 100%, 100%, and 80%, respectively. At a PD-L1 cutoff of 50%, the sensitivity, specificity, PPV, and NPV were 47%, 93%, 70%, and 84%, respectively. The concordance rates at a PD-L1 cutoff of 1% and 50% were 87% and 82%, respectively.

Conclusions

A PD-L1 IHC cutoff of 1% on EBUS-TBNA has a strong correlation with resected tumor specimen. At a PD-L1 IHC cutoff of 50%, there is a significant decrease in the sensitivity and PPV of EBUS-TBNA specimen when compared to resected tumor specimen. When analyzing for PD-L1 expression using a cutoff of 50%, EBUS-TBNA specimens may misclassify the status of PD-L1 when compared to the primary tumor.

(39) Submission ID#474549

Comparison of superimposed high-frequency jet ventilation with conventional jet ventilation for interventional bronchoscopy

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Yinghua Pei – Respiratory Department, Beijing Tiantan Hospital, Capital Medical University

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Superimposed high-frequency jet ventilation (SHFJV) is a new kind of jet ventilation, which uses a combination of high frequency jet ventilation (HFJV) and low frequency jet ventilation (LFJV) simultaneously. We sought to investigate whether SHFJV would provide safe and effective ventilation compared with single-frequency JV techniques in interventional bronchoscopy.

Methods
A multi-center prospective random single-blind clinical trial was conducted by 3 interventional bronchoscopy centers. All the patients, who would accept the diagnostic or therapeutic bronchoscopy procedures, were under general anesthesia. The patients in control group were ventilated by mono-frequency jet ventilation, the patients in trial group were ventilated by SHFJV. The PaO2 and PaCO2 were recorded before the anesthesia, in and after the procedure respectively. The SaO2 and ETCO2 were recorded every 10 minutes from the beginning to the end of procedure. Patients would be under observation till 24 hours after bronchoscopy, adverse events would be recorded.

Results
66 patients were eligible to the trial. 2 patients were excluded by the reason of age, 2 were excluded by failure insertion of rigid bronchoscope, 1 was excluded by anesthesia contraindication, 1 was excluded by the fault of oxygen source. Finally, 60 patients were included in efficiency analysis. 31 patients were in the control group, and 29 patients were in the trial group. No significant differences in demographic data between two groups. All the procedures performed successfully. In control group, 2 adverse events were recoded (1 transient atrial flutter, 1 tooth loss). In trial group, none adverse event was observed. There was no significant difference about adverse events between two groups.
In control group, the PaO2 measured in the operation was 270.42±148.22mmHg, which was higher than that in the trial group (177.10±105.50mmHg, p0.023). The PaO2, measured before and after the operation, had no significant difference between two groups. The other indicators (PaCO2, SaO2, ETCO2) at each time point had no significant differences between two groups. However, in the control group, the ratio of PaCO250mmHg was 58.1%, which was higher than trial group (31%, p=0.042), with significant difference between the two groups.

Conclusions
Superimposed high-frequency jet ventilation is effective and safe in rigid bronchoscopy, and it may have some potential advantages in providing more effective and stabilized ventilation than mono-frequency jet ventilation.

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Image or Table

Table 1.

Group	Cases	PaO2			PaCO2			SpO2	EtCO2
		Before	In	After	Before	In	After		
Trial group	29	220.48 ± 163.03	177.10± 105.50	261.89± 124.78	41.28± 5.99	45.63± 12.12	50.77 ± 9.41	98.58 ±2.10	35.50 ±6.66
Control group	31	275.13 ± 174.37	270.42± 148.22	293.84± 126.71	41.35± 5.77	56.32± 23.18	52.58 ± 15.45	98.85 ±1.01	35.12 ±9.84
p value		0.119	0.023	0.333	0.755	0.120	0.865	0.847	0.862

Table 2.

Group	PaCO2＜50mmHg n (%)	PaCO2≥50mmHg N (%)	x^2
Trial group	20(69.0%)	9(31.0%)	4.423*
Control group	13(41.9%)	18(58.1)	

* *p*=0.042

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Comparison of SHFJV with conventional JV for interventional bronchoscopy.pptx

(40) Submission ID#476597

Compassionate use of 3D Printed patient-specific airway stents: Cleveland Clinic experience

Submission Type: Oral and Poster

Submission Status: Complete

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Background
Commercially available airway stents come in limited shapes and sizes and often times do not fit well in patients with complicated airways. Poor fit of the stent to the airways can cause variety of complications including but not limited to: granulation tissue formation, stent migration and airway perforation. A patient specific 3 D printed stent may minimize complications, improve quality of life, and reduce need for repeated procedures. We describe our clinical experience with 3D printed stenting.

Methods
We retrospectively reviewed charts of all patients who had received 3D Printed patient-specific airway stents at Cleveland Clinic. A total of eight 3D stents were placed in 3 patients between 2/2016 to 11/2017. Bronchoscopists involved in procedures were asked to fill a survey related to their clinical experience with each stent they placed.

Results
Underlying airway disease was mostly related to granulomatosis with polyangiitis except one patient who had radiation-induced bronchial/tracheal stenosis. The latter had a 3D printed Y tracheobronchial stent placed. The rest had branched stents placed in their main stem bronchi with short limbs extending into the lobar airways (table 1). Most physicians reported no difference in stent loading compared to commercially available ones. On the other hand, they reported easier placement of 3 D printed ones in 75% of procedure performed. Somewhat harder placement was reported in 25%, and were strictly branched bronchial and lobar ones. No difference in difficulty of stent removal in majority of cases (57%) compared to 33% reporting somewhat easier removal of the custom made stents. Immediate stent related adverse events were seen in 3/8 implants placed (37%, all occurring in the same patient (ID # 3). These were mostly stent occlusion and infection (CTCAE grade 2-3) for stent # 4 and severe stent related pulmonary infection (CTCAE grade 4) necessitating hospital admission in stents # 7 and 8. Late, 30 days stent related adverse events were reported in three implants and were mostly due to granulation tissue (CTCAE grade 2) and biofilm formation (CTCAE grade 1). All bronchoscopists reported improved clinical change associated with all 3 D custom made stents placed.

Conclusions
Patient-specific airway stents appear to improve patients quality of life, reduce need for repeated procedures and reduce complications. Overall, bronchoscopists report improved experience with 3 D printed stents compared to commercially available ones especially in patients with complicated airways diseases.

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Image or Table

Stent #	Patient ID	Stent location	Initial procedure length (Min)	Mean duration between subsequent procedure (d)	Mean duration between subsequent procedures with prior stents (d)	3D stent lifespan (d)	Previous stent lifespan (d)
1	1	Y stent, trachea and main stem bronchi	65	51	18	➤ 196	79
2	2	Branched stent, LMS, LUL and LLL	42	41	25	411	43
3	2	Branched stent, LMS, LUL and LLL	47	42	25	➤ 255	43
4	3	Branched, LMS, LUL and LLL	57	101	40	405	39
5	3	Branched, RMS, RUL, BI	117	74	40	223	39
6	3	Branched LMS, LUL and LLL	117	74	40	223	39
7	3	Branched RMS, RUL, BI	58	13	40	➤ 142	39
8	3	Branched LMS, LUL and LLL	58	13	40	➤ 142	39

(41) Submission ID#454319

Complex subglottic tracheal stenosissilicone stent or T tube?

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Ting Wang – Beijing Tian Tan Hospital Capital Medical University

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

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Background
Subglottic tracheal stenosis is a specifically challenging for the treatment, owing to its proximity to the vocal cords. Simple web-like subglottic tracheal stenosis can be managed by endoscopic interventions such as balloon dilatation or laser application, while complex subglottic tracheal stenosis (stenosis1cm with cartilage damaged) require silicone or T tube implantation. However, the selection is difficult for physicians.

Methods
Herein, 17 patients with complex subglottic tracheal stenosis, who received silicone stent or T tube implantation, were analyzed retrospectively. Demographic data and findings on various aspects of therapeutic procedures were recorded, and the efficacy of both treatment methods compared.

Results
6/17 patients received silicone stent implanted, and 11/17 received T tube implantation. The two groups did not differ significantly in terms of stenosis distance to glottis, stenosis length, and stenosis grade. The mean adjacent normal tracheal diameter in the T tube and silicone stent groups did not differ significantly (p=0.350); however, the diameter of T tube was smaller than that of the silicone stent (p=0.048). The stent-to-airway diameter ratios in T tube and silicone stent groups were 0.78 and 0.99, respectively. Compared to the silicone stent group, the T tube group had a higher clinical success rate (p=0.028), a lower rate of granulation tissue formation (p=0.028), and a lower rate of migration (p=0.029). Retention of secretions and mucosal necrosis, observed in both groups, did not differ significantly (p=0.600, p=1.000, respectively).

Conclusions
The unique design of the T tube allows its use in the case of the diameter smaller than that of the trachea and preventing migration. Thus, the friction between the T tube and airway is avoided, preventing granulation tissue formation. Thus, the tracheal T tube is a viable alternative to long-term management of the unreconstructable trachea, allowing support to the airway and adequate phonatory and respiratory function in patients.

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Image or Table

Table 1 Demographic data of patients with subglottic stenosis

Characteristic	Silicone stent	T tube	Overall
Patient (no.)	6	11	17
Median age (years)	46	42	44
Gender (male/female)	1/5	8/3	9/8
Cause of stenosis			
Intubation	3	4	7
Tracheostomy	0	6	6
EBTB	2	0	2
RP	1	0	1
Tracheal trauma	0	1	1

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(42) Submission ID#455025

Complications in bronchoscopy: Data from the Japanese Diagnosis Procedure Combination database

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

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Background
As for the safety management in bronchoscopy, there have been little evidence of perioperative complications, including rare complications such as air embolism, myocardial infarction, or stroke. We aimed to evaluate the complications of both diagnostic and therapeutic bronchoscopy in hospitalized patients using national database in japan.

Methods
We retrospectively collected data of adult patients who developed air embolism, myocardial infarction, stroke (cerebral infarction, brain hemorrhage, subarachnoid hemorrhage), respiratory failure, and pneumothorax during hospitalization after diagnostic or therapeutic bronchoscopy, from the Japanese Diagnosis Procedure Combination database between July 2010 and 31 March 2014.
Bronchoscopy during mechanical ventilation were excluded. We assessed factors, including patients ADL (Barthel index) score, comorbidities at admission. The following comorbidities were identified using ICD-10 codes: heart failure, chronic renal failure, chronic liver disease, cerebrovascular disease, lung cancer, chronic obstructive pulmonary disease, bronchial asthma, interstitial pneumonia, and pulmonary hypertension.

Results
A total of 321,907 cases underwent bronchoscopy in inpatient settings. The number of incidence were as follows (number, (%)); air embolism: 13 (0.004), myocardial infarction: 1030 (0.31), cerebral infarction: 4894 (1.52), brain hemorrhage: 309 (0.23), subarachnoid hemorrhage: 743 (0.23), respiratory failure: 3163 (0.98), and pneumothorax: 6107 (1.89).

Conclusions
In the current study, we showed for the first time the incidence rate of air embolism, myocardial infarction and stroke after bronchoscopy in hospitalized patients. Air embolism after bronchoscopy was very rare.

(43) Submission ID#457693

Cone Beam CT Bronchoscopy for Peripheral Lung Lesions: A Paradigm Shift?

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Krish Bhadra – Rees Skillern Cancer Institute

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Interventional Pulmonology

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- Yes

Background

Navigational bronchoscopy limitations include reliance on existing imaging devices such as r-EBUS, fluoroscopy, and electromagnetic navigation. A bronchoscopist may successfully navigate to the virtual target and "kiss" the electronic lesion but not navigate to the correct location. Factors that lead to navigational error include dynamic changes in the target lesion from the time of imaging to procedure, suboptimal scans, difficult-to-see ground glass lesions, respiratory motion, atelectasis, and positional changes with instrumentation. The addition of cone beam CT (or real-time 3D imaging) may improve diagnostic yield and help overcome obstacles associated with navigational bronchoscopy. This study evaluates the initial experience with CBCT bronchoscopy including "CT tool-in-lesion" confirmation, diagnostic yield, radiation exposure, and complication rates.

Methods

Using the Medtronic superDimensionTM navigation system, the patient's anatomy is registered to a reconstructed 3D map. Following a planned pathway, the bronchoscope is wedged. The navigation catheter is then advanced as close as possible to the lesion. Additional imaging using r-EBUS and standard fluoroscopy are utilized to help localize the target lesion. When the navigation catheter is optimally aligned to the lesion,

the locatable guide is removed and a biopsy tool is inserted. The bronchoscope is secured into position using NeuWaveTM and custom flex grip bronchoscopy holders. Intra-operative CBCT (DynaCT, Siemens ZeegoTM) imaging confirms the current position of the tools and its relationship to the lesion. Repeat navigation is performed for the correction of the tool position if indicated. Biopsies of the target lesion are obtained. Up to three DynaCT intra-operative spins are performed.

Results

A total of 32 patients with 35 PLLs underwent CBCT bronchoscopy. The average age of patients is 65+/-12, 65% female and the average size of the PLLs is 27+/-15 mms. RUL/LUL PLLs accounted for 58% of lesions. 77% PLLs were located in the outer third of the lung. CT tool in lesion confirmation was achieved in 97% of patients. Diagnostic yield was 91%. Average radiation exposure is 577+/-396 mGy. Complications included 1 patient with a pneumothorax with chest tube placement.

Conclusions

CBCT bronchoscopy demonstrates excellent safety with a low pneumothorax rate and acceptable radiation exposure. CT evidence of tool-in-lesion confirmation achieved in 97% of target lesions and an overall diagnostic yield of 91%. CBCT real time 3D imaging may become the standard method of bronchoscopy for peripheral lung lesions.

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(44) Submission ID#458593

CORRELATION BETWEEN PLEURAL FLUID GenXpert® AND HISTOPATHOLOGY FINDING OF PLEURAL BIOPSY IN TUBERCULOUS PLEURAL EFFUSION

Submission Type: Poster Session ONLY
Submission Status: Complete
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Interventional Pulmonology

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- Yes

Background

Tuberculous pleural effusion or pleural tuberculosis (TB) is the most common extrapulmonary TB after lymphadenitis TB, but how to obtain definite diagnosis is remained a challenge. Pleural biopsy has historically been the gold standard procedure for the diagnosis of pleural tuberculosis. GenXpert® is a computer based nucleic acid amplification test that automatically detect Mycobacterium tuberculosis (MTB) DNA and resistance to rifampicin.

Methods

This was an observational analysis study with cross sectional design. Statistic analysis was using chi square test and contingency coofficient. The pleural fluid GenXpert® was tested in 23 patients with pleural effusion and their biopsy speciments were underwent histopathological analysis. Data analysis was performed to prove the correlation between pleural fluid GeneXpert® and pleural biopsy histopathology test results.

Results

There were 23 subjects with average age 48 years old and male majority (56,5%). All patients were present with coughing, breathlessness, decrease of body weight, chest pain, fever and/or hemoptysis as their chief complaint. Granuloma or caseous necrotic was found in 4 patients (17,4%) histopathological results obtained from pleural biopsy. Meanwhile, pleural fluid GenXpert® resulted positive in 6 patients (26,1%). The correlation between pleural fluid GenXpert® and histopathological findings of pleural biopsy specimen in patients with pleural tuberculosis has significant result with p value 0,040 (p value < 0,05). Sensitivity and specificity of pleural fluid GenXpert® were 75,0% and 84,2% respectively.

Conclusions

There was significant correlation between pleural fluid GenXpert® and histopathological findings of pleural biopsy in patients with pleural tuberculosis.

(45) Submission ID#458938

Correlation study between the sample size and freezing gas pressure in transbronchial lung cryobiopsy

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Xiaobo Chen – State Key Laboratory of Respiratory Disease, National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Disease,The First Affiliated Hospital of Guangzhou Medical University

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Interventional Pulmonology

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- Yes

Background
Transbronchial lung cryobiopsy is a new method of obtaining lung samples with cryoprobe. In clinical practice, although in the recommended range of normal freezing gas pressure and at the same freezing time, the sample sizes are quite different in different freezing gas pressure. We designed this animal study to evaluate the correlation between the sample size and the freezing gas pressure in transbronchial lung cryobiopsy.

Methods
Transbronchial lung cryobiopsies by using a 1.9mm cryoprobe were performed on three adult beagle dog which under general anesthesia with intubation. According to different freezing gas pressure, there were four experiment groups including the 60 bar group, 55 bar group, 50 bar group, 40 bar group. There were four freezing times (3 s /4 s/5s/6s) for each group, and 6-13samples were obtained in every freezing time. The sample areas, sample quality and complications were analyzed.

Results
The sample areas were significantly different among the 40 bar group, 50 bar group, 55 bar group and60 bar group with 0 mm2, (2.72±1.99) mm2, (4.87± 3.03) mm2 and (7.07±2.70)mm2 respectively(P=0.003)when the freezing time was 3s.The differences among sample sizes in the40 bar group, 50 bar group, 55 bar group and 60 bar group at other freezing times (4s/5s/6s) were statistically significant ($p<0.01$). There was significant positive correlation between the freezing gas pressure and the sample sizes at each freezing time ($r=0.68$-0.85, $p<0.01$). The samples were good quality with the freezing time only at 5s and 6s in the 50 bar and 55 bar group, while the samples were all good quality with the freezing time from 3s to 6s in the 60 bar group.

Conclusions
The sample area of transbronchial lung cryobiopsy is correlated with the freezing gas pressure. We recommend that we should pay more attention to the freezing gas pressure in cryobiopsy.

(46) Submission ID#453022

Cost Analysis of Mediastinal Lymph Node Biopsies with Endobronchial Ultrasound in the Endoscopy Suite versus the Operating Room

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Increasing costs in the United States continue to outpace inflation with the overall share of the United States economy dedicated to health-care spending being 17.8% in 2015. For this reason, healthcare providers should find strategies for reducing per capita costs of healthcare and reduce wasteful spending. We performed a cost analysis comparing patients who had endobronchial ultrasonography fine-needle aspiration (EBUS-TBNA) in the operating room (OR) or in the endoscopy suite (ES). Our objective is to determine the

most cost friendly strategy without compromising diagnostic accuracy.

Methods
We conducted a retrospective review of patients undergoing EBUS-TBNA for both suspected benign and malignant pathology. Patients had the procedure done either in the OR or the ES (September 2007 to November 2014). There were two additional group of patients; those who required mediastinoscopy and those who required any additional diagnostic procedure after EBUS. We calculated direct, indirect and total costs and profit margins for all groups.

Results
EBUS-TBNA was performed in 217 patients. 101 in the ES, 89 in the OR, 20 who had MED after EBUS and 7 who had another diagnostic procedure after EBUS. We found a statistically significant higher mean total and direct cost of EBUS performed in the OR (p=<0.001) compared to the ES. Total cost for EBUS performed in the OR was significantly increased by a mean of $1,040.55 after adjusting for age, gender, BMI, OSA, severe COPD and ILD (p=<0.001). In the same manner, direct cost for EBUS performed in the OR was significantly increased by a mean of $748.4 after adjusting for age, gender, BMI, OSA, SCOPD and ILD (p=<0.001).

Conclusions
Mean total and direct costs were significantly higher when EBUS-TBNA was performed in the OR, even after adjusting for important clinical characteristics. When done under experienced hands, EBUS-TBNA performed in the ES is a financial and environmentally reasonable diagnostic approach for suspected benign and malignant conditions, without compromising diagnostic accuracy.

(47) Submission ID#458110

Cricothyroid versus spray as you go method for lignocaine administration during flexible bronchoscopy (CRISP): A randomized controlled trial NCT02981277

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Karan Madan – All India Institute of Medical Sciences (AIIMS), New Delhi, India

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Interventional Pulmonology

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Background
BTS guidelines for flexible bronchoscopy recommend both cricothyroid injection and spray as you go method as acceptable techniques for delivery of lignocaine to the vocal cords and trachea. Few small randomized studies have compared these modalities. We hypothesized that cricothyroid delivery of lignocaine during flexible bronchoscopy is associated with less cough and superior operator rated procedure satisfaction at a lower cumulative lignocaine dose as compared with the conventional delivery using spray as you go method.

Methods
Consecutive subjects willing for participation were randomized in a 1:1 ratio to either the cricothyroid or spray as you go group. All patients received 2% nasal lignocaine gel (5 ml) and 4 sprays of 10% lignocaine spray to the pharynx. Patients in the cricothyroid arm received 5 ml of 2% lignocaine solution instilled via cricothyroid puncture prior to bronchoscope introduction followed by two 1.5 ml bronchoscopic aliquots of 2% lignocaine. Six aliquots (1.5 ml each) of 2% lignocaine solution were administered as baseline dose in the spray-as-you go group. Additional aliquots of 2% lignocaine were allowed at operator's discretion in both the groups. Co-Primary outcomes were cough count from bronchoscope introduction till reaching the carina and operator rated overall satisfaction (VAS) between the groups. Secondary outcomes were cumulative lignocaine dose, procedure duration, assistant rated cough (VAS), subject's willingness to return for repeat procedure and complications between the groups.

Results
500 patients were randomized and 495 patients received the allocated interventions (248: cricothyroid arm and 247: spray as you go arm). Baseline characteristics were comparable and mean age was 45.4 (16.2) years. Cough count till carina [median (range)] was significantly lower [(cricothyroid, 1 (0-10) and spray as you go, 4 (0-30), $p<0.0001$] and operator rated overall procedure satisfaction, VAS [mean (SD)] [(cricothyroid, 7.86 (1.39) and spray as you go, 6.86 (1.59), $p<0.0001$] significantly greater in the cricothyroid group. Patient willingness to return for repeat procedure was greater (87.1% vs 70.5%, $p<0.001$)) and cumulative lignocaine dose was significantly lower (305.08 (13.40) mg vs 322.18 (10.67) mg, $p<0.001$) in the cricothyroid arm while procedure duration was similar. Minor complications occurred in 6 patients in cricothyroid group and 9 patients in the spray as you go group ($p=0.42$).

Conclusions

Cricothyroid (Transcricoid) delivery of lignocaine for local anaesthesia is safe and associated with greater patient and operator comfort for performing flexible bronchoscopy procedure as compared with the spray as you go method.

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(48) Submission ID#451896

CT image analysis of pulmonary emphysema for bronchoscopic lung volume reduction with endobronchial valves

Submission Type: Poster Session ONLY
Submission Status: Complete
Submitter: Akifumi Tsuzuku – Pulmonary Medicine, Gifu Prefectural General Medical Center

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Interventional Pulmonology

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Background
Recently, advances in bronchoscopic techniques such as bronchial valves have been increasing in value for COPD. Bronchial valve therapy has been proven to be useful for patients with lobar heterogeneous emphysema and complete fissure. In this study, we measured emphysema scores and fissure integrity in patients with emphysema, then classified these based on CT image patterns to examine which patients were candidates for the therapy.

Methods
Between February 2013 and August 2017, we studied 96 consecutive patients with CT-detected emphysema (10 women and 86 men, mean age 72 ± 8 years). Quantitative CT imaging analysis was performed using Apollo software (VIDA Diagnostics Pulmonary Workstation Plus Software, Iowa City, Iowa, USA). Emphysema scores per lobe were converted to the Likert scale, where a score of 1 equals 1 to 25%, 2 (26 to 50%), 3 (51 to 75%), and 4 (76 to 100%). Lobar heterogenity of more than or equal to a 2-unit difference was needed between the adjacent lobes. The heterogeneous group was divided into complete and incomplete fissure groups. Fissure integrity scores of 80% and <80% were defined as complete and incomplete fissure integrity, respectively.

Results
93 patients were classified into either a heterogeneous group of 11 patients, or a homogeneous group of 82 patients. The heterogeneous group was then divided into a complete fissure group of 5 patients and an incomplete fissure group of 6 patients. The homogeneous group was classied into a complete ssure group of 40 patients and an incomplete ssure group of 42 patients. This study revealed that, of the 93 patients who were indicated, only 5 patients met the criteria of heterogeneous and complete fissure for bronchial valve

therapy.

Conclusions
We attempted to select candidates for bronchial valve therapy using Apollo software. In this study, the majority of patients with CT-detected emphysema had homogeneous emphysema. Therefore, we could not recruit a sufcient number of outpatients who met the criteria for bronchial valve therapy.

(49) Submission ID#458927

CT-fluoroscopic guidance for performance of targeted transbronchial cryobiopsy: a preliminary report

Submission Type: Oral Presentation ONLY

Submission Status: Complete

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

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Background
Bronchoscopy transbronchial cryobiopsy is increasingly used for histologic assessment of diffuse parenchymal lung disease. Diagnostic performance may be improved by more accurate targeting of biopsy to radiologic abnormalities, and complication rates may be reduced through avoiding biopsy of pleura or larger vessels. We report our preliminary experience of CT-fluoroscopic guidance for accurate targeting of bronchoscopic transbronchial cryobiopsy

Methods
Bronchoscopic cryobiopsy was performed in a hybrid CT theatre. 3D CT images were acquired following positioning of the cryoprobe in a distal airway segment. Where required, multiplanar reconstruction (MPR) was used to optimize views along the probe pathway. Where cryoprobe position was observed to too close to chest wall/diaphragm pleura, or not within region of interest within the lung parenchyma, re-positioning of probe was undertaken and repeat 3D images were acquired to confirm positioning prior to cryobiopsy.

Results
CT-fluoroscopic transbronchial cryobiopsy was successfully performed for investigation of interstitial lung infiltrates in three patients, and of an enlarging left upper lobe mass in one patient (figure 1 demonstrates diagnostic CT chest demonstrating LUL mass, and corresponding CT-fluoroscopic image demonstrating cryoprobe tip position). Images were reviewed following each acquisition to accurately assess probe position within the lung parenchyma, and relative to other thoracic structures. Intra-procedural imaging was of sufficient quality to allow accurate positioning of the cryoprobe tip with respect to both the parenchymal region of interest, and pleural surfaces.No complications occurred and all procedures yielded diagnostic specimens.

Conclusions
Our preliminary experience confirms the feasibility of performing transbronchial cryobiopsy under CT-fluoroscopic guidance. Accurate targeting of transbronchial cryobiopsy may be achieved using CT-fluoroscopic guidance. Positioning of probe tip both with respect to parenchymal region of interest, and to pleural surfaces can be established with high accuracy.

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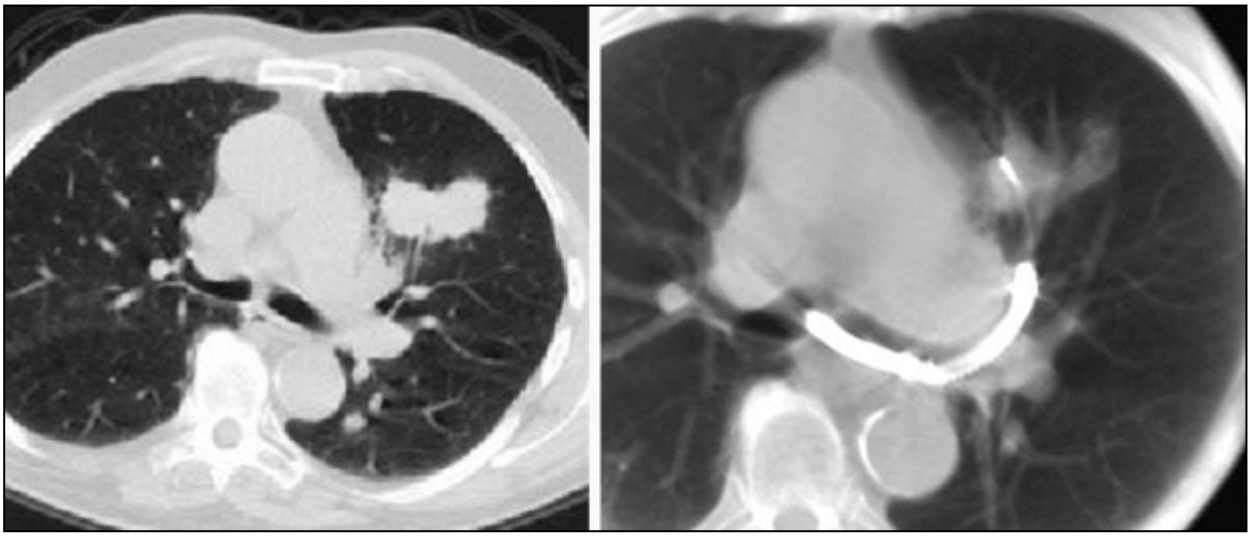
Image or Table



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(50) Submission ID#455027

Determining factors of endobronchial ultrasound (EBUS) overall accuracy under real-world conditions: A historical cohort study

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Luis Giraldo-Cadavid – Universidad de La Sabana; Fundacion Neumologica Colombiana

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Several factors have affected the accuracy of endobronchial ultrasound (EBUS) in explanatory trials, however, the evidence regarding such factors in real-life conditions is still scarce. We aimed at assessing potentially influencing factors on EBUS accuracy in a historical cohort study performed at a tertiary care university hospital.

Methods
Patients were sequentially recruited from January 2010 through March 2015. All EBUS were performed by at least one senior bronchoscopist (experience>100 EBUS), pathologist reading the samples had varied experience. The final diagnosis was made by histopathological analysis (94%) or follow-up imaging (6%). We explored the factors that could potentially affect the diagnostic accuracy, such as sex, age, indication, pathologist, bronchoscopist, nodal size and station and PET availability, using binary multiple logistic regression adjusting for confounding variables. Statistical significance was set at $P < 0.05$ (two-tails). Overall

accuracy was calculated by (TP+TN)/(TP+FN+FP+TN).

Results

During the study period 663 linear EBUS were performed. Most procedures were performed under conscious sedation (99.5%). Mean age (+ SD) was 63.7 +12.9 years, 71.9% were male. The most common indications were mediastinal adenopathies in patients with suspected lung cancer (68.7%) followed by extra-thoracic cancer (9.8%) and inflammatory/infectious adenopathies (7.7%). Median adenopathy size was 14mm (IQR: 10mm-20mm) and PET was available in 46.5% of cases. Most common nodal stations were 7 (29.4%), 4R (24.9%) and 10R (15.5%). Overall accuracy was 80.7%. Nodal station 4R (P=0.046) and greater pathologist experience (P=0.02) were independently associated with higher accuracy. Short-axis lymph node diameter < 1 cm (P=0.007), nodal stations 11R (P<0.01), 10R (P=0.03) and certain pathologists independently of their experience (P<0.01) were independently associated with lower EBUS accuracy. EBUS accuracy was not affected by the bronchoscopist when the EBUS was performed by at least one senior bronchoscopist.

Conclusions

Nodal station 4R and greater pathologist's experience were associated with higher EBUS accuracy. Small lymph nodes, nodal stations 11R and 10R and certain pathologists independently of their experience were associated with lower EBUS accuracy.

(51) Submission ID#461824

Determining Factors of Endobronchial Ultrasound-guided Transbronchial Needle Aspiration Specimens for Lung Cancer Subtyping and Molecular Testing

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Yujun Zhang – Shanghai Jiao Tong University, Shanghai Chest Hospital

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

This study is to explore the determining factors for testing epidermal growth factor receptor (EGFR) mutation and anaplastic lymphoma kinase (ALK) fusion gene after accurate subtyping with a panel of immunohistochemical marker. Molecular testing in NSCLC and non-SQCC.

Methods

Every patient of suspected advanced lung cancer performed EBUS-TBNA were collected from January 2015

to March 2016 at a clinical center. All samples which were diagnosed with lung cancer by histopathology were sent for immunohistochemistry (IHC) to identify subtypes. Among them, pathological classification identified as adenocarcinoma and non-small cell lung cancer-not other specified (NSCLC-NOS) were sent for molecular testing using remnant tissue samples, including EGFR mutation and ALK fusion.

Results

A total of 416 patients were diagnosed with lung cancer, including 39.9% (166/416) were adenocarcinoma, 7.7% (32/416) were NSCLC-NOS, 22.4% (93/416) were squamous cell lung cancer and 30.0% (125/416) were small cell lung cancer (SCLC). The EGFR mutations were detected in 77 cases (39.7%) and ALK fusion genes in 15 cases (7.7%), which were diagnosed as adenocarcinoma and NSCLC. Samples obtained from EBUS-TBNA were adequate for performing EGFR mutation analysis and ALK fusion genes in 194 specimens (98.0%)(194/198) after routine IHC simultaneously with the average pass of EBUS-TBNA was 3.1±0.7 without rapid on-site evaluation(ROSE). Results of Chi-square test indicated that the successful molecular testing was associated with the greater than or equal to 2cm in long axis diameter (p=2.84E-08) and greater than or equal to 1.5cm in short axis diameter (p=0.002). On univariate analysis, successful molecular testing was associated with more than 2 needle passes per lymph node (p=9.95E-07), long axis diameter (p=0.0002) and short-axis diameter (p=0.009).

Conclusions

With the average pass of 3.1±0.7, EBUS-TBNA is an efficient method to provide sufficient and adequate samples for performing molecular analysis of EGFR mutation and ALK fusion following routine histological testing and IHC subtyping. More than 2 needle passes per lymph node, long axis diameter and short-axis diameter were determining factors for successful molecular testing.

(52) Submission ID#477961

Development of advanced bronchoscopic service lines. The maturity model framework

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Gustavo Cumbo-nacheli – Spectrum Health Medical Group

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Advances in technology continue furthering our scope of practice. Endobronchial ultrasonography, electromagnetic navigation, ablative techniques, stenting, endobronchial valves are some techniques that advanced bronchosocopists resort to, regularly. The need to develop service lines collide with administrative needs and budget constraints.

Methods
We analized and describe our Interventional Pulmonology maturity model as a framework that is used as a benchmark for comparison when looking at our division growth processes vs other institutions.
It has been specifically useful to facilitate evaluation and data management strategies for sustained growth.

Results
We will review the present available bronchoscopic diagnostic and therapeutic tools, highlighting budgeting strategies and timing logistics. A maturity model for practice growth will is described in detail, as a visual aid to

enhance understanding of program direction.
Strategies on how to continue growing service lines and its financial impact is described.

Conclusions
Identifying needs and strategies for bronchoscopic service lines development is paramount for any IP practice.
Adopting a maturity model as a visual framework for displaying and identifying goals for continued growth will prove beneficial to bridge clinical and logistics gaps.
Financial implications, education and research aspects need to be equated for stained growth.

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Image or Table

Interventional Pulmonology (IP) Division Maturity Model

	Reactive	Proactive	Collaborative	Innovative	World Class
Community Impact	No IP services available. Patients referred to IP programs outside of West Michigan or hospice care.	Limited IP services available, patients able to receive diagnosis and short term interventions but require referrals for long term or complex intervention.	Full scale IP program providing services close to home for West Michigan residents. Referrals to large scale IP programs required only for complex airway cases when interventions have failed.	Large scale IP program. Offers short and long term interventions. Technology exceeds current industry standard.	Large scale IP program servicing patients throughout the United States. Leading industry in technologic capabilities.
Referral Source	From within SHMG Pulmonary	SH service lines (e.g. MST, LTC)	West Michigan oncology and pulmonology offices, marketing, advertising, e-consult.	Midwestern United States	Nationally; top 5 program in United States
Clinical Specialty	BAL, transbronchial biopsies, endobronchial biopsies, airway exam, brushing, fine needle aspiration	Cryotherapy, balloon dilation, Endobronchial ultrasound (EBUS), electromagnetic navigation bronchoscopy (ENB)	Airway stent placement, laser, rigid bronchoscopy, argon plasma coagulation, bronchial thermoplasty, IBV	Radial probe, whole lung lavage, autofluorescence, narrow band imaging, robotic navigation	Photodynamic therapy, brachytherapy, pleural service, multi-slice CT scanner
Technology	Limited technologic resources available or outdated technology.	Technological resources available but many are outdated.	Technology meets current industry standard.	Technology exceeds current industry standard.	State of the art program leading the field in research and technology.
Education	Clinical competency in advanced bronchoscopic modalities, procedural and bedside staff on new technologies and procedures, resources for patients and families	Mentorship of SHMG Pulmonary providers, develop continuing education program for providers and staff	Increase number of board certified interventional bronchosocpists	Develop and accredited Pulmonary Critical Care Fellowship and Interventional Pulmonary Fellowship	Endowed chairs
Quality	Establish competency metrics for Pulmonary providers, procedural and bedside staff	Establish quality metrics for IP program	Share clinical outcomes within the system	Benchmark outcomes against like institutions	Board representation with American Association of Interventional Bronchoscopy and Pulmonology (AABIP)
Research	Develop policy and procedure utilizing peer reviewed literature, journal club	Publish case reports in peer reviewed journal	Participate in funded research	Publish studies in peer reviewed journal	Presentation at conferences and hospitals related to IP
C-Suite Engagement	Support from departmental leadership, Pulmonary Division, executives close to service line. No C-suite champion.	Engaged local executives. Little or no C-suite engagement. Belief in program is not evident.	C-suite champion(s) identified with partial/occasional engagement when investments are required. Belief in program is inconsistent.	C-suite champion(s) takes active ownership, meeting regularly with program leaders to ensure program value. Belief and advocacy for program is strong	C-Suite champion(s) actively lead program and is sought as national advocate for Interventional Pulmonology

(53) Submission ID#459534

Diagnosis of peripheral lung lesion using endobronchial Ultrasonography with guided sheath and CT workstation

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: SooHyun Bae – Ulsan University Hospital

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Background
Bronchoscopy is useful tool in the diagnosis of lung nodule. But the the yield of peripheral lung lesion(PLL) is lower compared with central and intermediate lesion. Endobronchial ultrasonography with guided sheath (EBUS-GS) has been used to overcome such limitation, however the diagnostic yield of transbronchial lung biopsy (TBLB) using EBUS-GS in PLL is not as high as expected. Accordingly we attempted to use CT work station to raise diagnostic yield of TBLB using EBUS-GS for PLL.

Methods
From February 2017 to February 2018, 128 patients underwent EBUS-GS to diagnosis PPL at Ulsan University Hospital. The patients were randomized before EBUS-GS to group CW (the group using specific CT work station to reconstruct bronchus) or non-CW (the group not using CT work station). In analysis, 118 patients were included.

Results
Of the 118 patients, 57 were in group CW. No statistically significant differences were found between group CW and non-CW in terms of the duration of total procedure time (26.53 ± 10.24 vs. 25.81 ± 9.22 min, respectively, p=0.565), duration of navigation time (10.02 ± 7.30
vs. 8.67 ± 7.02 min, respectively, p =0.917). In CW group, EBUS probe was placed with the lesion 70.2% which was higher than non CW group, 67.2%.(p=0.729) Diagnostic yield of CW group was 71.9% and non CW was 82.0% respectively. (p = 0.524). Overall diagnostic yield of EBUS-GS was 75.6%.

Conclusions
CT workstation was a useful way to understand and reconstruct bronchus anatomy, but it did not shorten the procedure time. It helps EBUS probe to be placed within the lesion but there is no difference to improve diagnostic yield.

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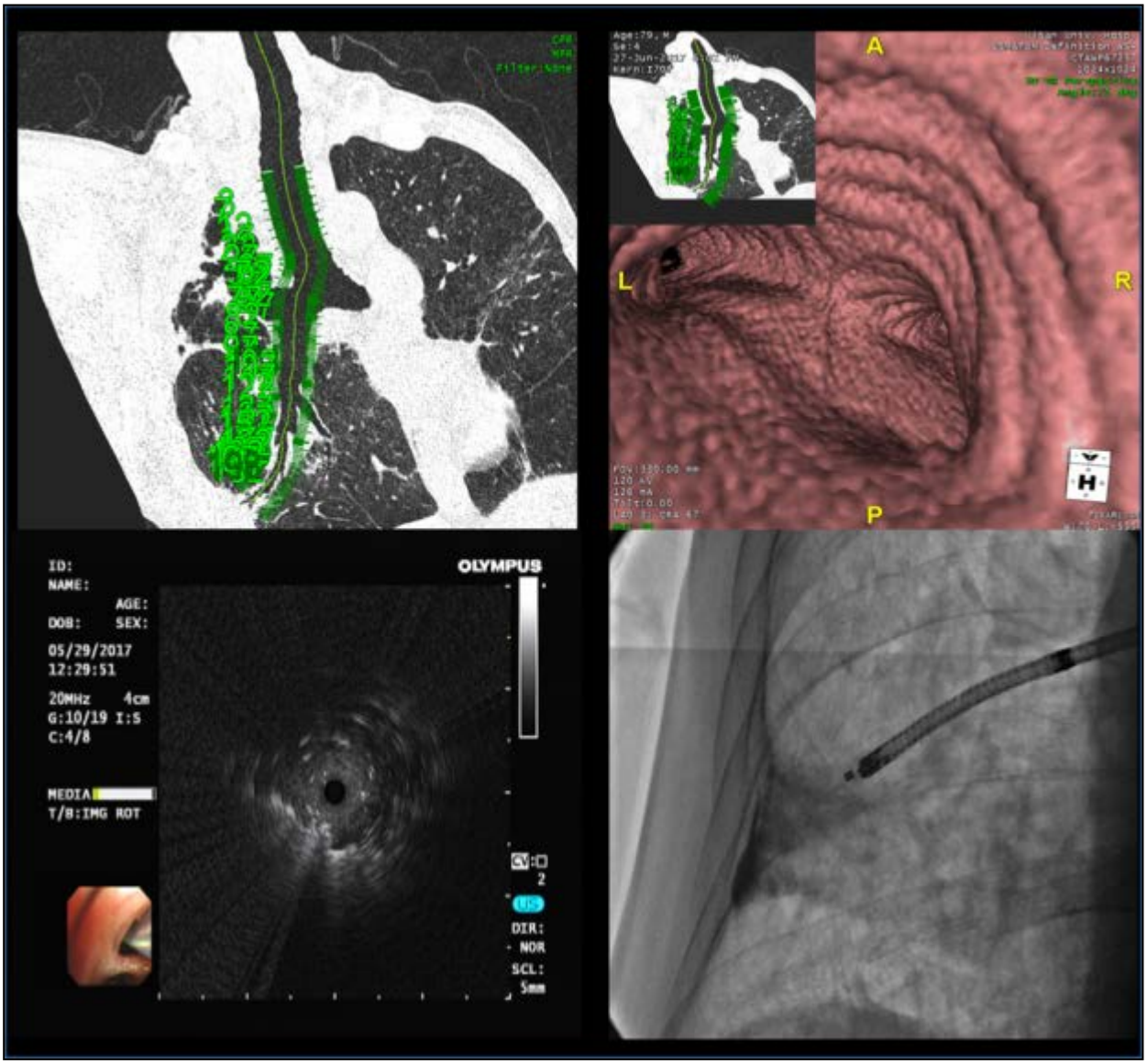

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(54) Submission ID#475764

Diagnosis of solitary pulmonary nodule with multiple bronchoscopic guided technologies: a prospective randomized study

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Faguang Jin – Department of Respiratory and Critical Care Medicine, Tangdu Hospital, Fourth Military Medical University, Xian, PR China.

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
The examination pulmonary nodules rate on CR is about 0.09-0.2%, so rapid identifying the nature of solitary pulmonary nodules (SPNs) with likelihood of malignancy is a critical challenge for the early diagnosis of lung cancer. So we conducted this study to compare the diagnostic yield and safety of EBUS-GS, VBN and the combination of EBUS-GS and VBN.

Methods
This is a prospective, multicentre, multi-arm, randomized controlled trial involving a total of 1095 subjects. We recruited all the patients that were conducted chest CT scan and find SPNs need to be diagnosed. All the subjects were randomly divided into three groups including: traditional no-guided bronchoscopy biopsy group (NGB group), EBUS-GS guided bronchoscopy biopsy group (EBUS group), and guided bronchoscopy biopsy group that combined EBUS-GS with VBN (Combined group). The primary endpoint was to investigate the difference in the diagnostic yield of the three groups.

Results
There was no significant difference in the diagnostic yield between the EBUS group (72.3%) and the Combined group (74.3%). And the diagnostic yield was 41.2% for the NGB group. The required time to determine the biopsy position was significantly less in the Combined group (7.96±1.18 min in Combined group vs. 11.92±5.37 min in EBUS group, $P<0.05$). The diagnostic yield for PPLs > 20 mm in diameter was significantly higher than that for those < 20 mm in diameter.

Conclusions
In conclusion, the results of our study suggest that guided bronchoscope could increase the diagnostic yield while dealing with peripheral lesions. And there was no significant difference in the diagnostic yield between the EBUS group and Combined group. But its use could significantly shorten the operation time.

(55) Submission ID#457789

Diagnostic value of blind transbronchial lung biopsy (TBLB) in diffuse pulmonary diseases
Submission Type: Poster Session ONLY
Submission Status: Complete
Submitter: Marioara Simon – Universitary Hospital ,,Leon Daniello" Cluj-Napoca

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Transbronchial lung biopsy (TBLB) is a bronchoscopy related technique, a viable alternative to open lung biopsy in patients with interstitial lung disease. We aim to evaluate the diagnostic yield, risks and

complications
of TBLB procedure without fluoroscopy in diffuse pulmonary diseases (DPD).

Methods
A retrospective analysis of 4200 fibrobronchoscopies (FB) performed from January 2016 to December 2017 in the Department of Bronchology of Cluj-Napoca Pneumology Clinic was conducted. The examinations were carried out under local anesthesia with Xylocaine 2% and moderate sedation with Midazolam, with a flexible bronchoscope.

Results
From the total number of 4200 FB we performed blind TBLB at 94 patients with DPD. We established a diagnosis in 76,59 % of the patients: tumoral 43,05%, sarcoidosis 19,44%, fibrosis 16,66%, inflammation 20,08%. From 2017 we performed transbronchial cryobiopsy (TBCB) without fluoroscopy in 10 patients (20% of the 2017 TBLB patients) and the results were 30% malign, 30% sarcoidosis, 30% fibrosis, inflammation 10 %. We had only one pneumothorax as complication and minimal bleedings.

Conclusions
Blind TBLB is an efficient diagnostic procedure in diffuse interstitial diseases with a 76,59% confirmation rate. TBCB increase the quality of samples and the diagnostic rate. In absence of fluoroscopy blind TBLB represents the method of choice in selected patients.

(56) Submission ID#456790

Diagnostic yield of N3 hilar staging by endobronchial ultrasonography (EBUS) in lung cancer

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Jaume Bordas Martinez – Bellvitge Universitary Hospital, L'Hospitalet, Barcelona, Spain

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Systematic lung cancer staging with EBUS has proven to be equivalent to cervical mediastinoscopy. Nevertheless, in the daily practice it is common to explore and sample negative PET-CT hilar N3 lymph nodes (LN). This study aims to explore if there is enough evidence to support this clinical practice.

Methods
Retrospective study from our database including 1,013 explorations over the last 5 years. Including criteria were patients with lung cancer staged by PET-CT and EBUS-TBNA. Mediastinal and hilar N3 LN with a short axis 5 mm were sampled with a 21G needle and assessed by rapid on site evaluation (ROSE). A single nuclear medicine expert reviewed blindly all PET-CT scans and determined the SUVmax of every LN. Those that were 5 SUVmax by PET-CT and/or 10mm in short axis by EBUS were considered abnormal.

Results
87 patients were included, of which 87% were male with a mean age of 66 years (SD 12.6). The final histopathology diagnoses were adenocarcinoma (46%), squamous cell carcinoma (39%) and other histology (14%). EBUS-TBNA was performed 30 days (SD 16.9) after PET-CT. None of the 61 normal hilar and normal

mediastinum N3 LN, and none of the 7 normal N3 hilar LN with abnormal mediastinal LN (3 by PET-CT, 3 by EBUS and 1 for both) resulted positive for lung cancer. Of the 19 patients with abnormal N3 hilar LN (6 by PET-CT, 8 by EBUS and 6 for both) malignancy was found in 16.7% , 25% and 60% for both techniques, respectively.

Conclusions
In absence of abnormal N3 hilar LN (PET: SUVmax<5; EBUS<10mm in short axis) it seems there is not enough evidence to sample them, regardless of N3 mediastinal status.

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Mediastinum		Hiliar		Positive N3 hiliar	Sample	%
EBUS	PET-CT	EBUS	PET-CT			
-	-	-	-	0	61	**0**
>10mm	-	-	-	0	3	**0**
-	>5 SUVmax	-	-	0	3	**0**
>10mm	>5 SUVmax	-	-	0	1	**0**
+/-	+/-	>5 SUVmax	-	1	6	**16,7**
+/-	+/-	----------	>10mm	2	8	**25**
+/-	+/-	>10mm	>5 SUVmax	3	5	**60**

(57) Submission ID#459275

Easier technique to deliver EWS (Endobronchial Watanabe Spigot)

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Moustafa Abed – Sahlgrenska University hospital /Gothenburg Sweden

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Endobronchial Watanbe Spigot (EWS) is a silicone-made bronchial filling. It developed by Dr: Yoichi Watanabe at 2003. It used to prevent persistent air leak with pneumothorax, pyothorax or as a temporary treatment for hemoptysis. The EWS grasped with forceps which already introduced through the working channel of the bronchoscopy. The method is difficult when we have angled bronchi specially in the segment level. This is because the bending capacity of the EWS when it holds with the forceps.

Methods

Anew technique applied to deliver the EWS by using a trans bronchial needle (TBN) instead of forceps. We introduce the TBN through the working channel and insert the EWS at the tip. Its possible to insert the needle with angle up to 30 degree if the aimed segment i angled. Because of the fixed kontakt of the needle with the EWS, it will be possible to rotate the EWS while passing the bronchial tree.
To deliver EWS in place just to withdraw the TBN with when the EWS is in the desired place. The protecting sheath with the support of the bronchoscopy will keep the spigot in place.

Results

20 EWS delivered with this technique. There was no difficulty to place it to any segment. No adverse effekt. The time needed is about 3 min för each EWS to deliver it in place.The possibility to introduce the EWS further deep in the subsegment level is easier with this method. No spigot has been dropped in the way down.

Conclusions

To deliver the EWS with TBN technique is easy, safe and time saving. It makes possible to deliver it in difficult angled segments. There is no risk to drop it in the way down. The EWS is firmly touched to the needle that we can drive it to the desired Place. To push it firmly in the segment or subsegment without any risk for the patient to cough it out.

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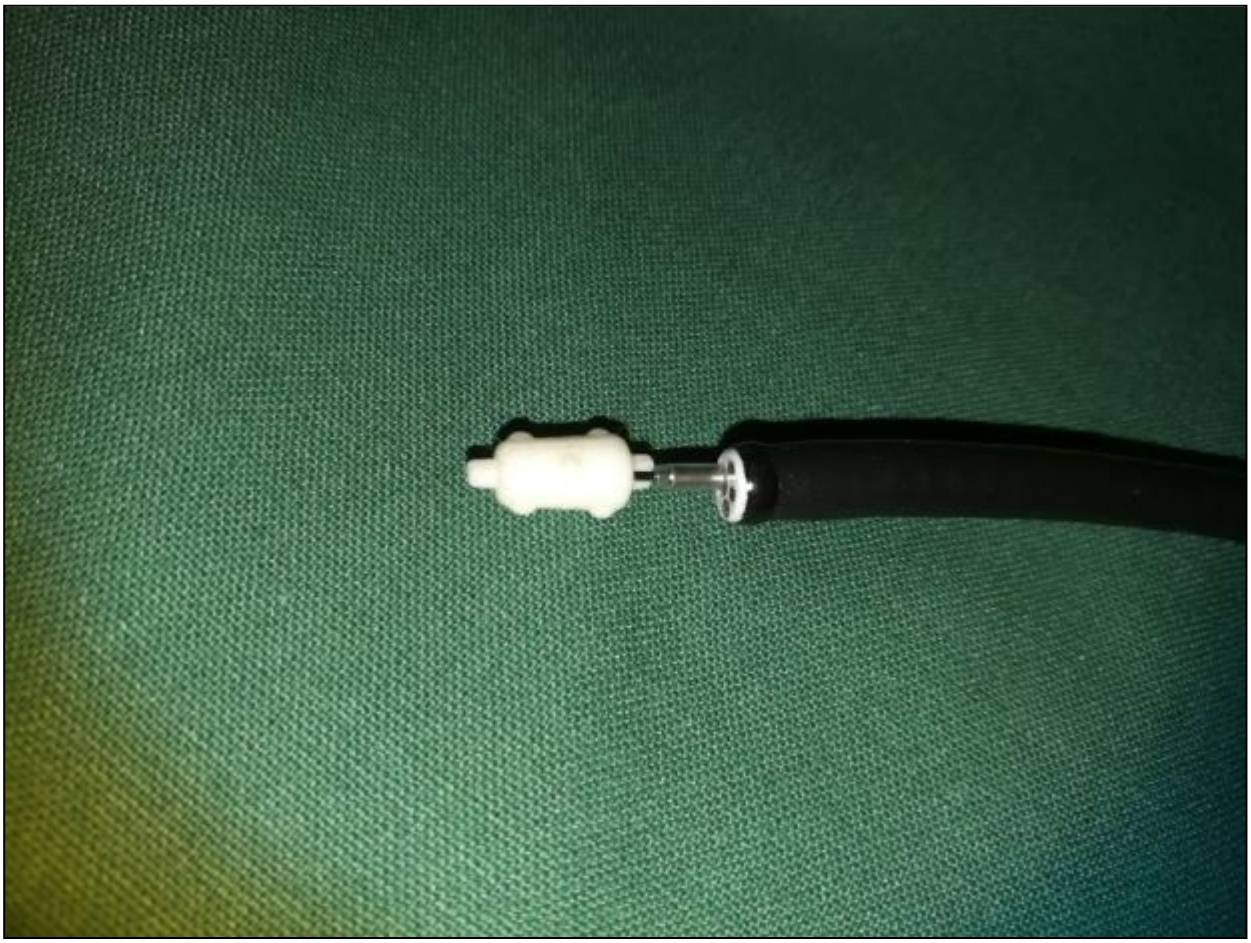

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(58) Submission ID#477917

EBUS and/or EUS for primary and metastatic thoracic tumors

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Dmitry Sokolov – P.A. Herzen Moscow Oncological Research Institute - division of National Medical Scientific Radiological Center

---

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

To analyze results of combined transbronchial and transesophageal ultrasonography (EBUS and EUS) with fine-needle aspiration (FNA) of intrathoracic lymph nodes and mediastinal tumors in advanced cancer diagnostics and staging.

Methods

Endoscopic ultrasonography of intrathoracic lesions was performed from 2007 till 2016 in 653 patients with the

preliminary diagnosis as follows: peripheral (165) and central (359) lung cancer; mediastinal tumors (69); suspected metastases of non-thoracic cancers into intrathoracic lymph nodes (60).

Results
Overall diagnostic efficiency of EBUS-FNA and EUS-FNA in tumor verification was 86-87%. Combination EBUS and EUS improves the efficiency of diagnosis in 8-9%. No complications were confirmed during and after these procedures.

Conclusions
EBUS-FNA and EUS-FNA is a high-precise procedure for thoracic tumors diagnostics, especially - lung cancer. EBUS-FNA increases accuracy of the lung cancer staging, particularly by N criteria. EBUS and EUS combination increases the effectiveness of diagnosis.

(59) Submission ID#475733

EBUS TBNA for Clarification of PET Positive FDG Avid Intrathoracic Lymph nodes in cases of known Malignancy in a Tuberculosis Endemic Setting

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Nevin Kishore – Max Hospital , Saket , New Delhi

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration (EBUS-TBNA) enables real-time lymph node sampling, therefore enhances diagnostic accuracy and enables staging of cancer more accurately. PET/CT (positron emission tomography-computed tomography) is widely performed in mediastinal lymph node staging of cancer. However, the diagnostic efficiency of PET/CT remains controversial in ruling out malignancy in patients with coexisting inflammatory or infectious diseases like Tuberculosis which often results in False FDG avid positivity . EBUS TBNA helps to correctly stage cancer and pick up false positive FDG avid lymph nodes in such situations and the role of PET/CT scan in mediastinal lymph node staging remains variable when comparing TB and non-TB endemic regions.

Methods
A retrospectively study evaluating the utility of EBUS TBNA in 85 consecutive patients which were known cases of malignancy with FDG avid mediastinal lymphadenopathy, detected positive on 18 fluorodeoxygenase(FDG)- PET/CT was conducted . TBNA samples were subjected to rapid onsite cytology evaluation (ROSE) followed by cytological evaluation. PET FDG avid Positivity was defined as a maximum standardized uptake value (SUV max) of 2.5.

Results
The median size of nodes inn this series was 18 mm. and 10 % were sub-centimeter . Out of the 85 PET positive cases evaluated, EBUS-TBNA confirmed malignancy in 50 cases (59%), 11 cases had granulomatous pathology (13%), 17 had reactive lymphadenopathy (20%), 6 were inadequate(7%), 1 case that had malignancy also had co-existing granuloma(1%). 35 (41 %)of the PET CT positive cases were found to be false positive.

Conclusions
About 41 % of the PET CT positive cases in our study, which is located in a tuberculosis endemic setting , were found to be false positive when subjected to EBUS TBNA . This is significantly higher when compared to a non TB endemic area as per the literature (29%) Rintoul et al .
The reliability of PET CT in staging patients with malignancy is lower in TB endemic settings than in non-endemic settings .

Reference:-
1) Robert C. Rintoul et l. EBUS-TBNA for the Clarification of PET Positive Intra-Thoracic Lymph Nodes . Journal of Thoracic Oncology , Volume 4, Number 1, January 2009 :44-48.

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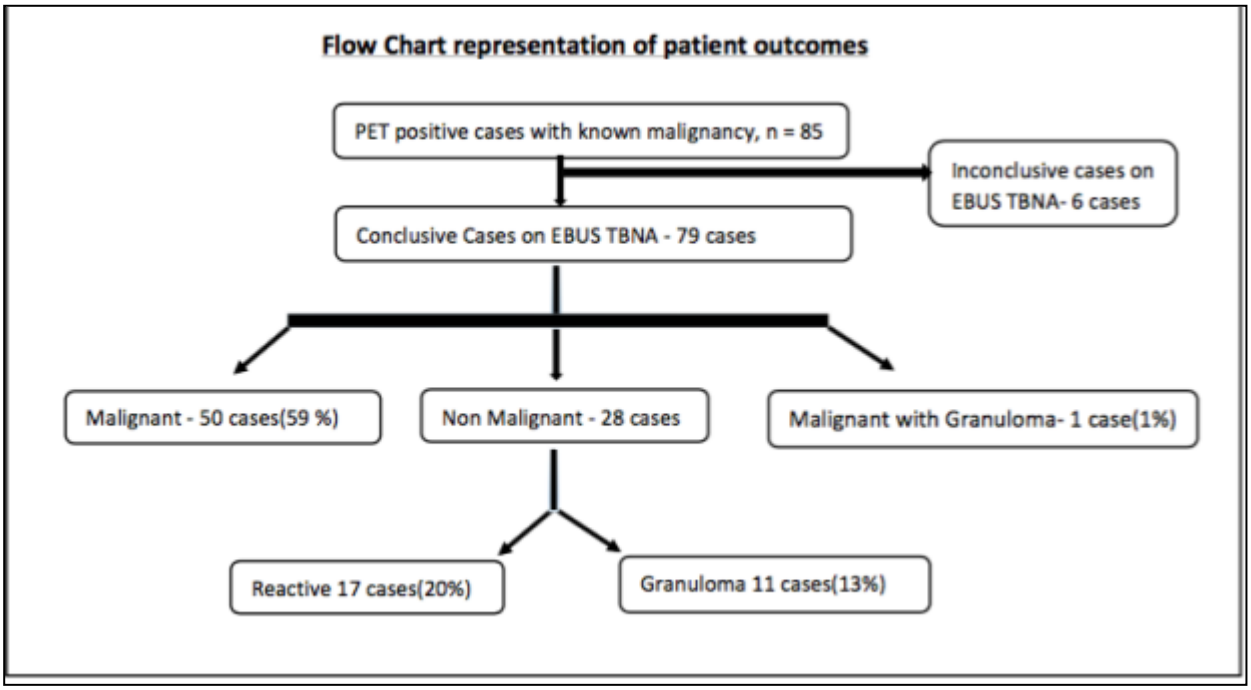

(60) Submission ID#477988

Efficacy and safety of Bronchoscopic Minimal Invasive Therapies for Tracheobronchial Mucoepidermoid Carcinomathe difference between children and adults

Submission Type: Oral and Poster
Submission Status: Complete
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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
To evaluate the efficacy and safety of bronchoscopic minimal invasive therapies for patients with tracheobronchial mucoepidermoid carcinoma (MEC).

Methods
The clinical features, pathological stage, treatments and survival rate were retrospectively reviewed in 18 Patients with tracheobronchial MEC from Aug 2008 to May 2017. Two groups were divided into child and adult individuals according to the age of patients. Clinical parameters, including pathology, the invasion into bronchial wall, treatment strategy and survival status, were compared between the two subgroups.

Results
(1) There are 10(55.6%)patients with MEC in the child group and 8(44.4%) in the adult group. (2) Low-grade MEC pathologically were discovered in all children while 25% of high-grade MEC in the adult patients . As tumor growth pattern was concerned, 90% of tumors in the child subgroup presents intraluminal type, while only 37.5% of adults presents intraluminal type. (3)Multiple procedures were conducted under bronchscopy,

including rigid bronchoscopy, argon plasma coagulation (APC), dioxide carbon cryotherapy and electric loops. Tumors could be completely removed after bronchscopic interventions. The bronchoscopy associated complications were rare. (4) Other treatments: In child subgroup, only one patient underwent additional left upper lobectomy. In adult subgroup, additional lobectomy and/or targeted therapy and/or radiotherapy were conducted in three patients. (5) Follow-up of a median 52 months revealed that all children survived without any tumor recurrence. While for adult subgroup, one patient with high-grade MEC died of respiratory failure after follow-up for 8 months.

Conclusions

Almost all children have low-grade and intraluminal MEC, while one third of adult has invasive high-grade MEC. Multiple procedures under bronchoscopy are effective in erasing low-grade intraluminal MEC, without any severe complications. For high-grade invasive MEC, comprehensive therapeutic strategy should be considered.

(61) Submission ID#459073

Efficacy and Safety of Conscious Sedation with Midazolam and Sufentanil for Bronchoscopy: A Single Center Retrospective Study of 11158 cases

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Yao Yao – The First Affiliated Hospital of Guangzhou Medical University

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Disclosure Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
The combination of benzodiazepine and opioid is recommended for bronchoscopy. Sufentanil, an opioid with higher potency than fentanyl is rarely reported in bronchoscopy. The aim of this study is to evaluate the efficacy and safety of conscious sedation with midazolam and sufentanil for bronchoscopy.

Methods
Efficacy, safety and influential factors of 11158 cases of bronchoscopy under conscious sedation with topical lidocaine, midazolam and sufentanil from Sept. 2013 to June 2017 in our hospital were analyzed.

Results
7089 males and 4069 females aged 54±16(range,4-94) were included. The dosage of sufentanil and midazolam are 5.25±1.28ug(2-13ug) and 2.03±0.51mg(0.5-4.5mg) respectively. 98.6% (10998/11158) bronchoscopies were done successfully. Age was associated with lower incidence of adding dosage of both sufentanil and midazolam(OR1, P0.05). TBLB, EBUS-TBNA, therapeutic procedures and severe cough were associated with higher incidence of adding dosage of both sufentanil and midazolam(OR1, P0.05). COPD was associated with lower incidence of adding dosage of midazolam (OR=0.616 [95%CI 0.437-0.869]). Female, pulmonary infection and asthma were associated with higher incidence of adding dosage of sufentanil (OR1, P0.05). 160 cases (1.4%) failed to complete the procedure, of which 112 cases (1.0%) had bad cough, 15 cases (0.2%) had hypoxemia, 2 cases had poor cooperation and 32 cases (0.29%) had other reasons. There was neither respiratory failure requiring tracheal intubation nor adverse events of cardiovascular and nervous systems needing rescue measures.

Conclusions
Conscious sedation with midazolam and sufentanil for bronchoscopy is safe and effective.

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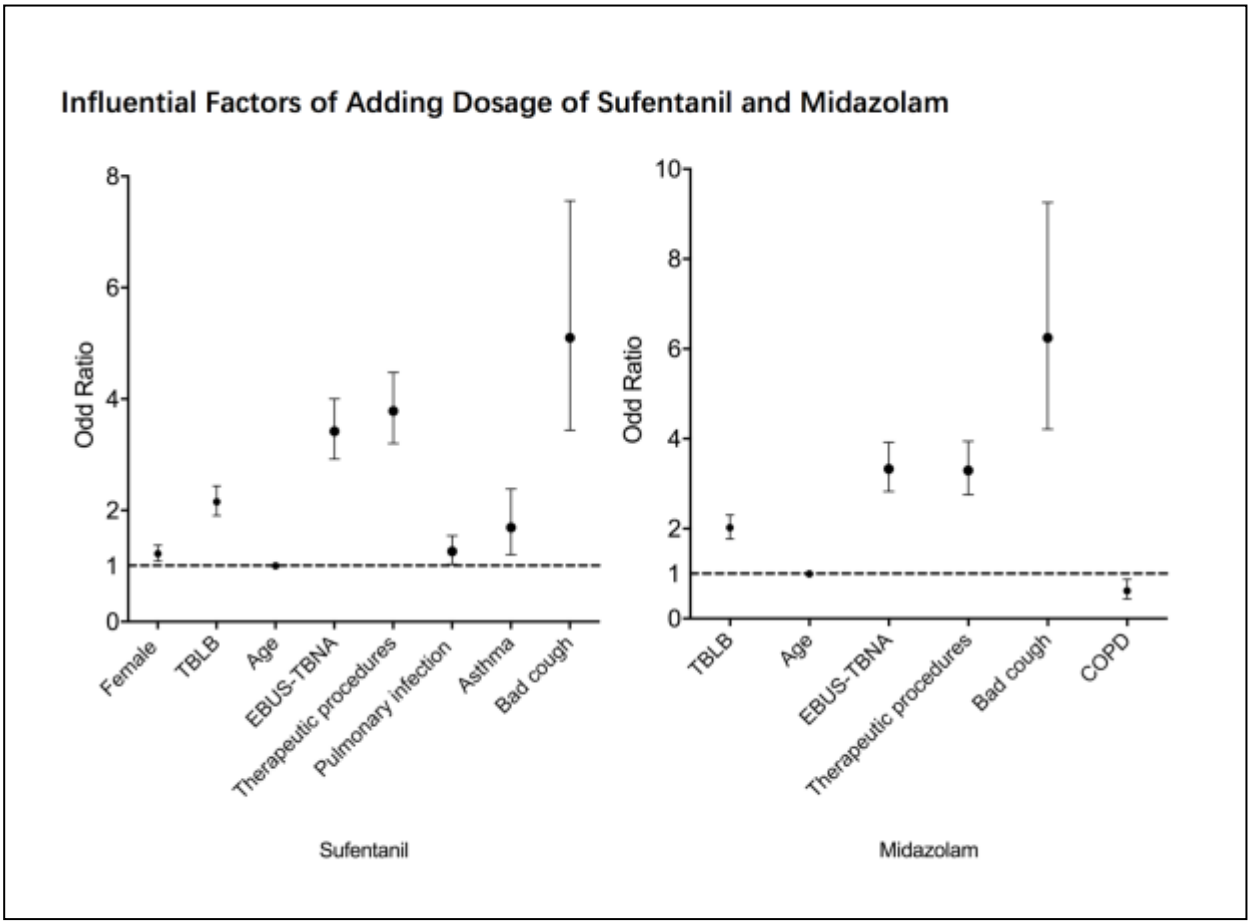

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(62) Submission ID#457935

Efficacy and safety of Paclitaxel-loaded PLGA coating stents in the treatment of benign cicatricial airway stenosis: a prospective single arm multicenter clinical study

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Xiaojian Qiu – Department of Pulmonary Diseases

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Airway stent implantation is a method to treat benign airway stenosis. However, stents can stimulate scar granulation tissue proliferation locally, resulting in restenosis and treatment failure. We have systematically studied the function of Paclitaxel in the prevention of airway restenosis, and developed a Paclitaxel-loaded PLGA coating stent. The purpose of this study is to implant these stents in the airway of patients with benign cicatrical airway stenosis, and to observe the efficacie and safety of the treatment.

Methods
Patients of benign airway stenosis are from four hospitals in China. For ethical reasons, there is no control group in this study. The purpose of the study is to observe whether our research results in animal experiments can be achieved in clinical practice. The observation time was six months. The bronchoscopy was repeated every week in the first month and every month in the other five months. Once the obvious scar granulation

tissue proliferation was found, and the stent was covered by scar or granulation, the stent would be removed immediately, so as to ensure the safety of the patient.

Results

A total of 10 patients were included. The etiologies included six cases after tuberculosis and four cases after tracheal intubation. The stenosis types were benign cicatricial airway stenosis, without airway malacia or collapse. One week after stent implantation, all patients had various scar granulation tissue proliferation. The obvious proliferation were on the upper edge and the narrowest airway in the middle part of the stent. Three stents were taken out after three months, including one case was cured and two other cases were ineffective. Complications occurred in the other seven patients after stent implantation not more than three months, leading to the removal of stents in advance. The stent placement time was 6.51 + 4.67 weeks. The main complication was granulation scar tissue proliferation, resulting in the stent being unable to move under biopsy forceps. Due to the failure of 90% of the cases, the experiment was terminated in advance.

Conclusions

Although Paclitaxel-loaded PLGA coating stents have good effects in basic research and animal experiments, they can not prevent the occurrence of airway restenosis after stent implantation in clinical application. The main reason for the failure is the proliferation of the granulation scar tissue.

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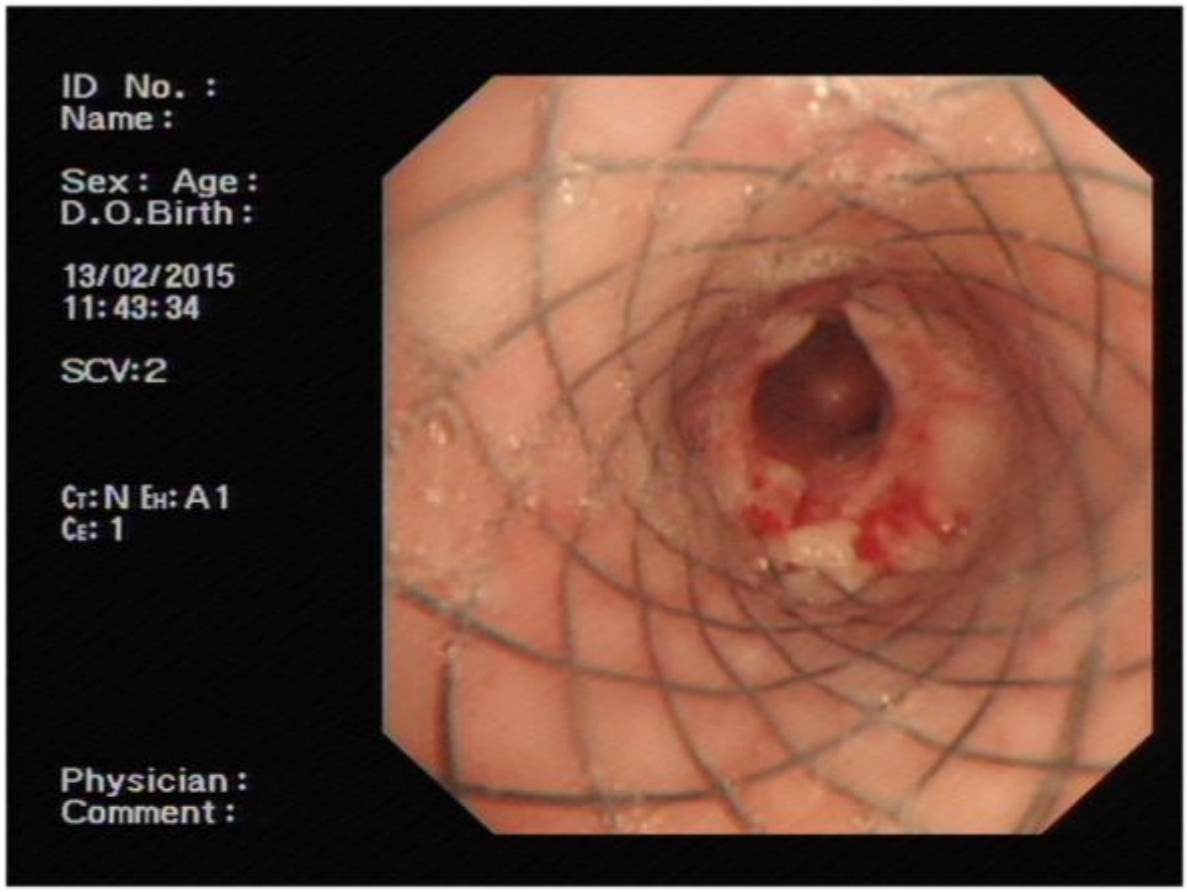
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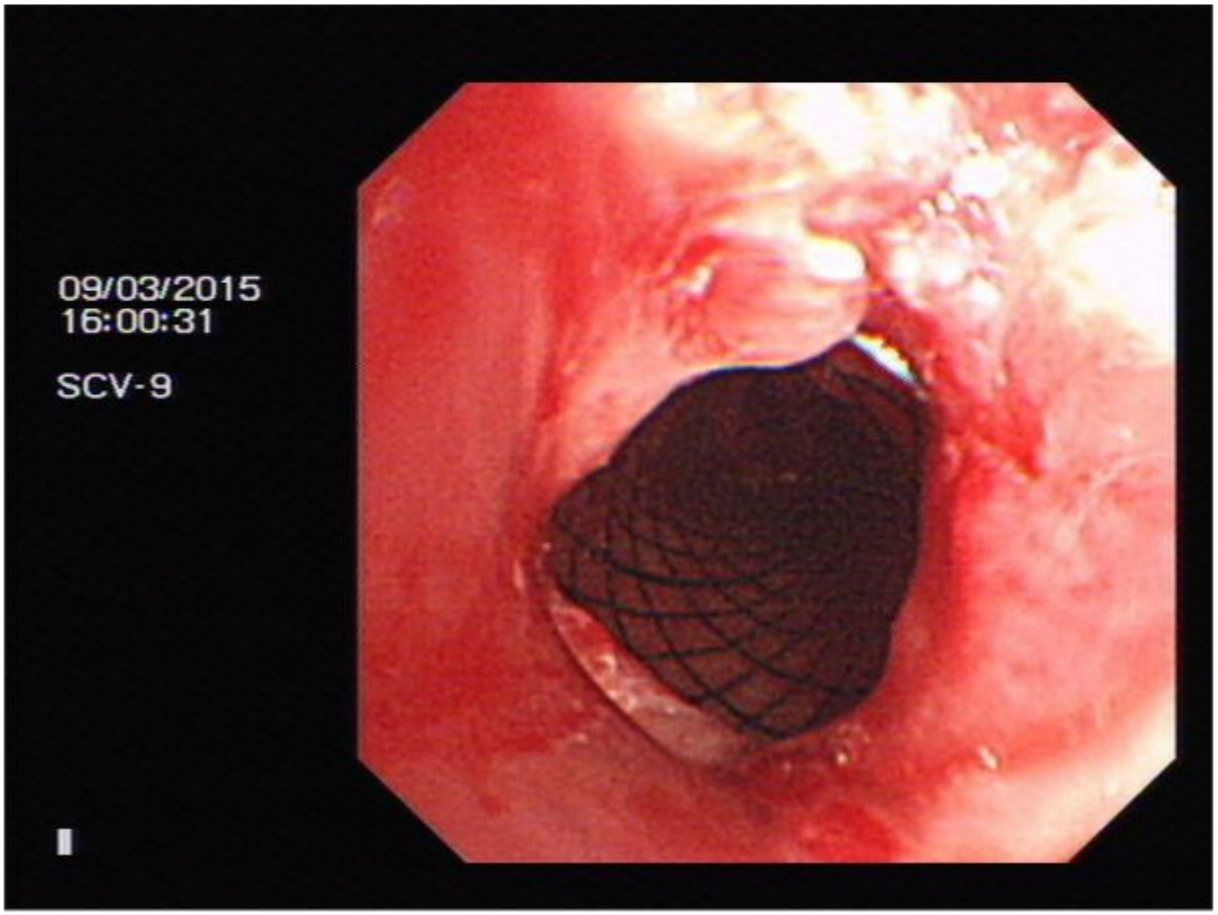
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(63) Submission ID#459237

Efficacy of interventional bronchoscopy in treatment of benign lung tumors

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Mihovil Roglic – University Hospital Center Zagreb, Department for Pulmonary Diseases

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Role: Presenting Author
Disclosure:
Disclosure Status: Complete
Disclosure: Nothing to Disclose
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No financial relationships or conflicts of interest.

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Interventional Pulmonology

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- Yes

Background
Benign tumors of the lungs are rare, discovered usually accidentally on chest X-ray. Occasionally they are located endobronchially thus causing obstruction and consequent clinical presentation. Surgery is usually performed but interventional bronchoscopy may often be a better, lung sparing solution. The aim of our study was to present the rate of success of interventional bronchoscopy in endobronchially located benign tumors of the lungs.

Methods
Retrospective analysis of our patient records and bronchoscopy charts with more than 900 procedures during the 6 year period revealed 23 procedures performed in 19 patients with benign tumors.

Results
An average age of our patients with benign tumors of the lung attending interventional bronchoscopy was 54.8 years with slightly more men (57.9%) than women (42.1%). The most frequent tumor was hamartoma in 7 patients (36.8%), followed by lipoma in 4 patients (21.1%), fibroma in 3 (15.8%) and myofibroblastoma in 2 patients (10.5%). Majority of procedures were performed in general anesthesia (82.6%) while procedures in local anesthesia (17.4%) were repeatedly performed in 3 patients. The most often used technique was electrocautery snare (87.0%) and laser photocoagulation (65.2%), with cryoablation in a minority of cases (21.7%). The procedure was successful in a grand majority of cases (82.6%), while 3 were partially successful and 1 unsuccessful, requiring surgery in 3 patients. Median follow up time was 23 months. Multivariant analysis that included age, sex and type of the procedure did not detect parameters associated with successful outcome.

Conclusions
Although rare in clinical presentation, benign lung tumors could be symptomatic if located endobronchially. In such instances they could be successfully treated using interventional bronchoscopy thus leaving only the minority of cases for highly invasive lung surgery.

(64) Submission ID#477608

Efficacy of intralesional triamcinolone acetonide injection combined with radial incision for recalcitrant benign central airway stenosis

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Zheng Wang – Henan Provinicial People's Hospital

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Benign central airway stenosis is treated with various interventional procedures in combination, but some seems to be treated more easily. The current study is to evaluate the efficacy and safety of local injection of triamcinolone acetonide (TA) combined with radial incision for benign central airway cicatricial stenosis.

Methods
Non randomized trial of conventional interventional treatment or TA injection+radial incision in benign central airway stenosis. Thirty-six patients with refractory benign central airway stenosis were treated with local injection of triamcinolone acetonide (TA) combined with radial incision after repeatedly conventional interventional treatment in our hospital during July 1st 2015 and September 1st 2017 were retrospectively analyzed. Fifty-six patients with intractable benign central airway stenosis that were managed with conventional interventional treatment were enrolled as the control group. TA was locally injected into the circumference of incised of stenosis lesions. Patients were followed by 6-12 months. The efficacy and safety of these two methods were evaluated by the airway diameter, dyspnea score, interphase of interventional treatment and clinical stabilization, fasting blood glucose, plasma cortisol, injection local mucosal and clinical symptoms before and after treatment.

Results
After 6 to 12 months follow-up, both groups showed similar efficacy, but the total expenses and times of interventional therapy were significantly lower in the treatment group than in the control group. Complications included rash (n=1) and hyperglycemia (n=1, leading to discontinuation of TA treatment), but no adrenocortical insufficiency or other complications. The duration of bronchoscopic interventional operation in the two groups was (35.6 ±18.4) minutes and (27.1±8.7) minutes, respectively (P=0.022). The average times of treatment in the TA group and the control group was 1.7±1.1 times and 4.7±3.3 times in 6 months. The total times of interventional bronchoscopy, as well as the total times of balloon dilatation, heating ablation, cryotherapy and stent implantation per each patient during 6 months were significantly lower than those of the control group.

Conclusions
Local injections of TA therapy combined with radial incision is equally efficient for refractory benign central airway cicatricial stenosis, but may yield better cost-effectiveness.

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Image or Table

Efficacy of intralesional triamcinolone acetonide injection combined with radial incision for recalcitrant benign central airway stenosis

MA Yun[1], Wang Zheng[1], YANG Huizhen[1], ZHANG Quncheng[1], WANG Kuopen[2]*

*1 Dept of Respiratory & Critical Care Medicine, People's Hospital of Zhengzhou University, Zhengzhou, China; 2 Interventional Pulmonology, Division of Pulmonary Medicine and Critical Care, Johns Hopkins University, School of Medicine, Baltimore, MD 21287, USA. *Correspondence: MA Yun, MD. e-mail: mayun315@163.com.*

Methods

Retrospective analysis. TA group: 36 pts with refractory benign central airway stenosis who were treated with local injection of triamcinolone acetonide (TA) combined with radial incision. Control group: 56 pts treated with conventional interventional treatment. In the TA group, TA was locally injected into the circumference of incised of stenosis lesions following electroacupuncture release of the airway stricture scarring.

Results

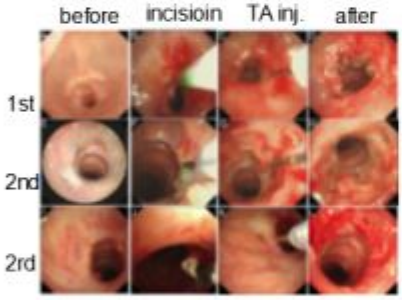

Fig 1. A representive case in the TA group.

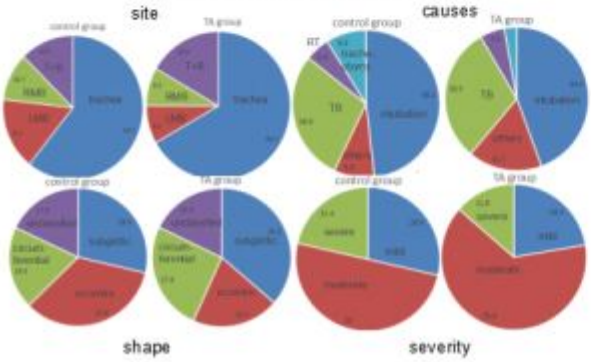

Fig 2. Characteristics of both groups.

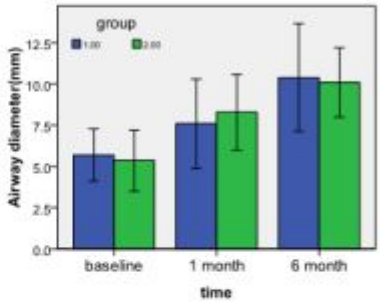

Fig 3. Airway diameter(mm) before and after intervention.

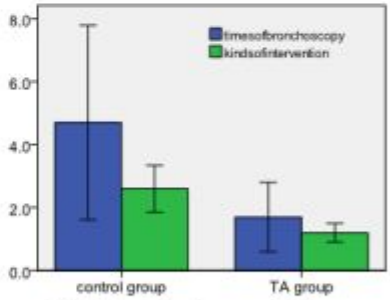

Fig 4. Operation times and kinds.

Conslusions

Local injections of TA therapy combined with radial incision is equally efficient in refractory benign central airway cicatricial stenosis, but may yield better cost-effectiveness.

References

1.Murgu SD, et al. Chest 2016,150(2):426-41.
2.Shin B, et al. J Thorac Dis 2017;9(11):4413-23.

(65) Submission ID#458129

Electrocautery snare and laser photocoagulation in treatment of lung carcinoids

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Mihovil Roglic – University Hospital Center Zagreb, Department for Pulmonary Diseases

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Role: Presenting Author
Disclosure:
Disclosure Status: Complete
Disclosure: Nothing to Disclose
Signed: *Mihovil Rogli* (2/27/2018, 8:46 AM)
No financial relationships or conflicts of interest.

Interventional Pulmonology

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- Yes

Background
Lung carcinoids are predominately located endoluminaly in central airways and surgical resection is recommended treatment of choice. Although it is often possible to excise the tumor endoscopically, minimally invasively, more evidence is lacking that would confirm place for interventional bronchoscopy in the guidelines.

Methods
Over a 6-year period we performed 15 interventional bronchoscopy procedures on 10 patients (8 female, 2 male; average age 54.1 years) for carcinoid resection. According to histology two were atypical, while eight were classified as typical carcinoids.

Results
Procedures were performed mostly in general anesthesia (73.3%) while the remaining (26.7%) were performed in local anesthesia. Electrocautery snare was the most used technique (73.3%) followed by laser photocoagulation (66.7%). Snare was used only in general anesthesia while laser photocoagulation was used in both general and local anesthesia. In four patients procedure had to be repeated up to three times in

intervals from less than one month up to 58 months. Follow up was done in eight patients with median time of 25 months (N/A for 2 patients).

Conclusions
Interventional bronchoscopy can be used as a safe, cost and time effective procedure for treating both typical and atypical lung carcinoids using electrocautery snare and laser photocoagulation. Growing body of evidence will assure the position for interventional bronchoscopy in therapy guidelines.

(66) Submission ID#478106

Electromagnetic navigation paired with cone-beam CT for diagnosis of difficult peripheral lung lesions: a prospective pilot trial

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Carlos Aravena Leon – Cleveland Clinic

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Disclosure:

Disclosure Status: Complete

Disclosure: Does Disclose

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Interventional Pulmonology

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- Yes

Background

We conducted a prospective, single center, pilot study to examine the added value of performing electromagnetic navigation bronchoscopy (ENB) with concurrent cone-beam computed tomography (CBCT) confirmation in patients with technically difficult peripheral lung lesions. This project was designed to

understand the rate of navigation success and biopsy success by using real-time multi-planar image guidance and what factors may reduce diagnostic yield.

Methods
ENB with CBCT guidance was performed in patients with a peripheral lung lesion, chosen for being complicated for biopsy. The factors considered to be associated with a difficult lesion were location closed to a fissure/pleura, no bronchus sign, size <20 mm, prior lung resection, high risk for percutaneous image-guided biopsy, lesion with a non-direct pathway and a prior non-diagnostic advanced bronchoscopy.
ENB was performed, fluoroscopy and radial endobronchial ultrasound (R-EBUS) were used to verify to be in the lesion, then the locator was replaced by the biopsy tool, the C-arm mounted CBCT was positioned around the patient, a scan was performed to confirm the placement of the tool within the lesion. Once positioning was confirmed, biopsies were taken. The outcomes were as follows: ENB navigation success, cone-beam instrument placement success, lesion sampling success, and diagnostic yield.

Results
20 patients met the inclusion criteria. The average lesion size was 14.4mm (range 7-23). A bronchus sign was noted in 6. R-EBUS was used in all cases; 20% in the lesion, 50% adjacent to the lesion. Navigation success was 90%, and CBCT instrument success was 80%. Biopsy success was 70%. Six cases of lung malignancies and one benign lesion were diagnosed, seven subjects had indeterminate, and six had non-diagnostic nodules. After a follow-up of 10.8 months, three indeterminate lesions have shown resolution or stability. The final diagnostic yield was 50%. Seventeen patients (85%) had atelectasis in the CBCT scan, in seven cases it obscured and 13 displaced the nodule. The mean radiation effective dose was 312.7 mGy. Pneumothorax occurred in 1 subject.

Conclusions
This study confirmed some of the expected challenges. Navigation success does not equally biopsy success that does not equal yield even with proof of a biopsy instrument inside the target lesion. Although CBCT is a powerful tool to acquire and definitively prove instrument and lesion location in real time but still shows that navigation, instrument, and biopsy success is not associated with 100% yield. This technique helps us to understand the limitations of the advance bronchoscopy procedures.

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Image or Table

Table 1: Successful outcomes

	ENB navigation success[1]	Cone-beam instrument placement success[2]	Lesion sampling success[3]	Diagnostic Yield[4]
n	18	16	14	10
%	90	80	70	50

1. ENB navigation success is the ability to get at least 15mm to the target center
2. Cone-beam instrument placement success is the ability to both navigate to and then confirm the presence of a biopsy instrument in the target lesion
3. Lesion sampling success is defined by the ability to obtain a sample from the parenchymal lesion
4. Diagnostic yield is defined as a malignancy and non-malignancy definitive diagnosis in the bronchoscopy evaluation, and indeterminate nodules diagnosis (anything other than non-diagnostic pathology in bronchoscopy sample) that showed stability or resolution in radiographic follow-up

(67) Submission ID#459816

Endobronchial Management of Traumatic Airway Rupture

Submission Type: Case Report

Submission Status: Complete

Submitter: Amit Tandon – Henry Ford Hospital

Author(s)

Amit Tandon

Interventional Pulmonology Fellow

Henry Ford Hospital

Role: Presenting Author

Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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No financial relationships or conflicts of interest.

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Role: Co-Author

Interventional Pulmonology

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- Yes

Background
The incidence of patients whom make it to the emergency room alive with tracheobronchial injuries from blunt force trauma ranges from 0.5 to 2 percent. The mainstay of management for these patients depends on the size of the defect and the timing of presentation. Here we describe the first endobronchial repair of a traumatic left mainstem bronchus rupture following a motor vehicle collision.

Case Report
A 25 year old male driver presented to the hospital after a motor vehicle accident with air bag deployment and prolonged extraction. On initial survey the chest radiograph revealed a moderate sized pneumothorax requiring chest tube placement as well as a positive FAST exam requiring an exploratory laparotomy. After the operation he was noted to have a persistent air leak with worsening subcutaneous emphysema. A bedside bronchoscopy revealed a distal left mainstem full thickness rupture extending up the lateral wall to the left upper lobe (LUL) bronchus as well as into the left lower lobe (LLL) bronchus past the superior segment.

After this finding he was taken to the operating room for endobronchial repair of the rupture. He was intubated with a rigid bronchoscope and the defect was filled with cyanoacrylate glue and a twelve millimeter balloon was utilized to compress the glue to the airway walls. Post procedure his PEEP was weaned from twelve to eight centimeters of water pressure. The day after the procedure the leak in the tube was resolved and he was extubated 11 days post repair.

He has since underwent three follow up bronchoscopies with complete healing of the rupture and 100 percent patency of the LUL and 90 percent patency of the LLL. There have been no post procedure complications including, but not limited to pneumonia, pneumothorax or extension of rupture.

Conclusion
Management of tracheobronchial defects have been dependent on the size of the defect smaller or larger than two centimeters with conservative and surgical management respectively. As with this case it may be feasible to first try endobronchial repair prior to moving forward with lobectomy or pneumonectomy.

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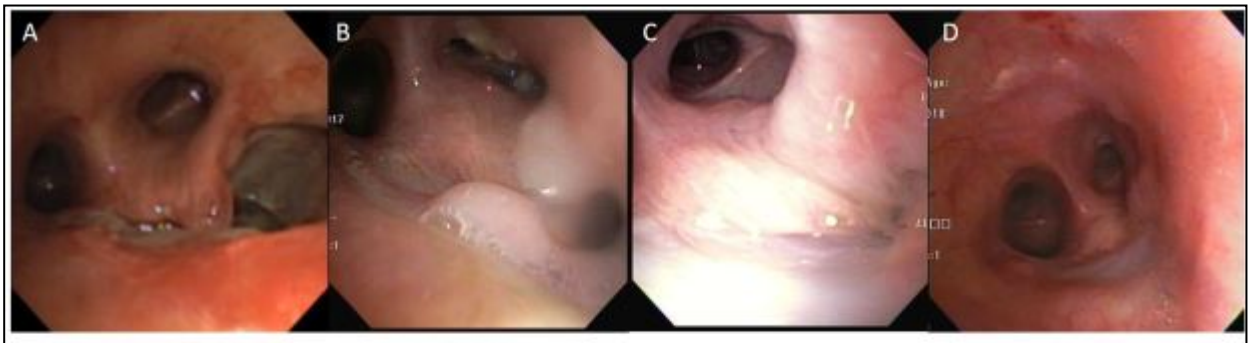

A. Rupture to the distal left mainstem (LMS) bronchus
B. LMS: One month after instillation of cyanoacrylate glue
C. LMS: Two months after instillation of cyanoacrylate glue
D. LMS: Three months after instillation of cyanoacrylate glue

(68) Submission ID#459012

Endobronchial Ultrasound Elastography: Validation of a standardized technique for mediastinal staging in non-small cell lung cancer

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Lokesh Yagnik – Fiona Stanley Hospital

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Disclosure:
Disclosure Status: Complete
Disclosure: Does Disclose
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South Metropolitan Health Service (Grant/Research Support)

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Role: Co-Author

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Mediastinal staging procedures in Non-small cell lung cancer (NSCLC) with endobronchial ultrasound (EBUS) transbronchial needle aspiration (TBNA) can be long as multiple lymph node (LN) stations need to be

systematically sampled. EBUS elastography may potentially identify non-malignant LNs which dont require sampling, thus shortening the procedure. However, current studies use varying techniques and diagnostic cut-offs so the utility of elastography performed at different centres by different operators is uncertain. This study aims to examine effects of technique variation on elastography measurements and prospectively validate an optimised method.

Methods

79 patients with 142 LNs undergoing EBUS TBNA for suspected NSCLC between July 2017 and January 2018 were recruited. For the development set (41 patients, 85 LNs), repeated measures of colour maps and Strain ratios (SR) were collected using variations in operator technique (degree of thumb flexion/probe pressure, frame average function) and random versus red extra-nodal region of interest (ROI) for SR calculations. Blinded scoring assigned colour maps as non-malignant (predominantly green/red) or suspicious for malignancy (mixed, predominantly blue). The gold standard allocation of nodes as benign or malignant was made based on TBNA cytology +/- surgical histopathology. The sensitivity, specificity and negative predictive value (NPV) of elastography colour map for the detection of malignant nodes was calculated and agreement between repeated measures assessed using the kappa statistic. The power of SR to detect malignant nodes was examined by constructing Receiver operating curves (ROC) for the various techniques and calculating median differences/intra-class correlation coefficients (ICC) for repeated measurements. An optimal technique for colour map and SR calculation was then chosen to maximise NPV and reproducibility. This was prospectively tested on a validation set (38 patients, 57 LNs).

Results

Table 1 shows results for the development and validation sets (diagnostic indices, reproducibility of measurements (kappa and ICC) and ROC curves for SR with median differences between repeated measures). The optimal technique for image acquisition chosen used maximal thumb flexion/probe pressure, frame-average function for colour map generation and SR calculation using a red extra-nodal ROI. The NPV of colour map and SR for detection of malignant LNs was 100%.

Conclusions

There is significant variation in EBUS elastography colour map and strain ratio measures depending on operator technique and selection of ROI for SR calculation. Using a standardised technique gives reproducible results with good NPV, allowing accurate identification of non-malignant LNs which can be excluded from TBNA sampling, thereby shortening EBUS staging procedures.

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Image or Table

Development Set				
Colour Map				
Technique	Sensitivity (%)	Specificity (%)	NPV (%)	Agreement *(Kappa)
Probe pressure [Ø]				
Light Pressure	85	64	93.6	
Max Pressure	93.5	50.4	96.7	
Light vs Max Pressure				0.35
Frame Averaging [Δ]				
Random Frame	90.3	51.3	94.9	0.33
Frame Averaging	87.9	62.5	94.9	0.57
Strain Ratio				
Technique		AUC	Agreement* (ICC)	Median diff scores (IQR)[#]
Random ROI [$]		0.66	0.2	1.84 (0.97-5.5)
Red ROI [$]		0.86		
Validation Set	**Using maximum pressure frame average technique and red ROI[$]**			
Colour Map	Sensitivity (%)	Specificity (%)	NPV (%)	Agreement* (Kappa)
Max Pressure Frame average	100	67.5	100	0.64
Strain Ratio		AUC	Agreement* (ICC)	Median diff scores (IQR)[#]
Red ROI[$]		0.89	0.67	1.42 (0.37-3.77)
	Sensitivity (%)	Specificity (%)	NPV (%)	
SR Red Cut off 2.5	100	56%	100%	

Table 1 Colour map and strain ratio prediction of malignant lymph nodes according to technique
*Agreement of repeated measures
[Ø] Probe Pressure: Amount of pressure applied with the EBUS tip to tracheobronchial wall. Controlled by varying the amount of flexion applied with thumb on the bronchoscope
[Δ] Frame averaging: Function on Olympus EU-ME2 Premier Plus EBUS processor where the colour map is generated by averaging colour maps over several frames
[#] Median Difference in scores with interquartile range
[$] Random ROI: random extra-nodal region of interest, Red ROI: red extra-nodal region on interest

Powerpoint Upload

2018 WCBE Elastography TalkV2.pptx

(69) Submission ID#453622

Endobronchial Ultrasound Guided Transbronchial Needle Aspiration (EBUS-TBNA) Can Be Safely Performed In Early Pregnancy Without Prior Computed Tomography or Positron Emission Tomography Imaging

Submission Type: Case Report
Submission Status: Complete
Submitter: Yitat Lo – PYN Eastern Hospital, Hong Kong

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Role: Presenting Author
Disclosure:
Disclosure Status: Complete
Disclosure: Nothing to Disclose
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Role: Co-Author

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Endobronchial ultrasound guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive

procedure to obtain tissue for the diagnosis of pulmonary lesion. It is usually done after computed tomography (CT) or positron emission tomography (PET) scan is available. However, CT or PET may be precluded, especially in pregnant patients with early gestation. We report a case of young pregnant lady who had chest X-ray (CXR) abnormality underwent EBUS-TBNA without CT/PET images.

Case Report

A 30 years old lady being a non-smoker and enjoyed good past health, presented with one month history of dry cough without systemic symptoms. She had no family history of lung carcinoma (Ca lung) or tuberculosis (TB) contact. Physical examination was unremarkable. Urine pregnancy test was positive with gestational age estimated by last menstrual period (LMP) to be around 6 weeks. CXR with abdominal shield showed right apical nodules and right mid zone lobulated shadow. The differential diagnosis included TB, Ca lung, or other lesions. Sputum acid-fast bacilli (AFB) smear and cytology were negative. CT, magnetic resonance imaging (MRI) of thorax, or whole body PET scan were all rejected by radiologist due to early pregnancy with radiation risk to fetus. After discussion, she agreed to undergo bronchoscopy and EBUS-TBNA. Bronchoscopy showed mild bulging at proximal RB5 segment without endobronchial lesion. Bronchoalveolar lavage, brushing and endobronchial biopsy were negative for malignancy, granuloma and TB-PCR. Systematic assessment by subsequent convex probe EBUS scope identified enlarged lymph nodes at stations 7 (1.5x1.7cm), 10R (1.2 x 1.4cm with overlying vessel), 11Rs (1.9 x 1.7cm) and 12R (2.3 x 1.7cm). EBUS-TBNA was performed at stations 7, 11Rs and 12R uneventfully. The TBNA specimens confirmed adenocarcinoma with EGFR mutation with deletion of exon 19. The lady decided to terminate pregnancy after confirming advanced stage of lung adenocarcinoma for PET/CT staging hence early commencement of treatment. The PET/CT scan showed multiple hypermetabolic right lung masses and nodules, right pleural lesions, right pulmonary and mediastinal lymphadenopathies, and right femoral neck foci consistent with lung malignancy with intrapulmonary, pleural and bone metastases. She was then started with Erlotinib for stage IV adenocarcinoma of lung.

Conclusion

EBUS-TBNA can be safely performed in early pregnancy for the diagnosis of pulmonary lesion when done systematically even without prior CT/PET images.

(70) Submission ID#454855

Endobronchial ultrasound guided-transbronchial biopsy to patients with interstitial lung disease for diagnosing peripheral pulmonary lesions in or adjacent to an area of fibrotic lesion

Submission Type: Poster Session ONLY
Submission Status: Complete
Submitter: Takayasu Ito – Tosei General Hospital

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Disclosure:
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Role: Co-Author

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Patients with interstitial lung disease (ILD), especially idiopathic pulmonary fibrosis (IPF) frequently have lung cancer. The majority of lung cancer were located in lower lobes, peripheral area and honeycomb formation. In the diagnosis of lung cancer with ILD, the best diagnostic method was inconclusive. Endobronchial ultrasound-guided transbronchial biopsy with a guide sheath (EBUS-GS TBB) may be well-tolerated and effective procedure in diagnosing peripheral pulmonary lesions (PPLs) with ILD. However, the diagnostic yield of PPLs in or adjacent to an area of fibrotic lesion by EBUS-GS TBB may be unsatisfactory for the difficulty of reaching the lesions related to the obtuse angle of bronchial branch. In addition, diagnosing PPLs in or adjacent to an area of fibrotic lesion, EBUS-GS TBB may have high complication of pneumothorax. Hence, we retrospectively investigated the diagnostic yield, and complications of EBUS-GS TBB between PPLs in or adjacent to an area of fibrotic lesion, and those at a distance from fibrotic lesion in patients with ILD.

Methods
Between November 1, 2014 and December 31, 2016, 243 was performed by EBUS-GS TBB. ILD was identified on the base of high resolution computed tomography. Patients were divided into two groups; PPLs in or adjacent to an area of fibrotic lesion and those at a distance from fibrotic lesion.

Results
46 ILD patients were identified in 243 EBUS-GS patients. Twenty-eight patients had lesions in or adjacent to an area of fibrotic lesion and eighteen patients had lesions at a distance from fibrotic lesion. In the baseline characteristics, FVC, percent predicted ,DLCO percent predicted , and lesion size were not significantly different between the two groups(p=0.429, p=0.420, p=0.480, respectively) Twenty-eight patients were successfully diagnosed by EBUS-GS TBB (60.9%, diagnostic yield). The diagnostic yield of lesions in or adjacent to an area of fibrotic lesion was significantly lower than that at a distance from fibrotic lesion. (46.4% VS.83.3%, p=0.017). From the point of complications, pneumothorax occurred in seven patients (15.2%, frequency of pneumothorax). There was no significant difference in the complications between the two groups (17.9% VS. 11.1%, p=0.534).

Conclusions
In diagnosing PPLs by EBUS-GS TBB with ILD patients, PPLs in or adjacent to an area of fibrotic lesion had lower diagnostic yield than those at a distance from fibrotic lesion. Although overall frequency of pneumothorax was high, there was no significant difference between the two groups.

(71) Submission ID#477839

Endobronchial Ultrasound-Transbronchial Needle Aspiration for The Diagnosis of Lymphoma Using Large Bore Needles in Addition to The Standard 21 G Needle. Our Initial Experience

Submission Type: Oral and Poster

Submission Status: Complete

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- Yes

Background
The use of endobronchial ultrasound transbronchial needle aspiration (EBUS-TBNA) with 21 G or 22 G (TBNA) needles for metastatic lung cancer is well validated. However, the efficacy of EBUS-TBNA for the diagnosis of lymphoma is less clear. It is unclear whether the use of large bore needles (LB) in concert with standard needles provide ample tissue for the diagnosis and characterization of lymphoma.

Methods
A retrospective review of online medical records was conducted at our institution by identifying all cases of patients with mediastinal and hilar lymphadenopathy where lymphoma was suspected, and where EBUS-TBNA was performed using a lymphoma protocol where LB, and TBNA needles were used. Data obtained included, diagnosis, Results from cytology, surgical pathology and flow cytometry were recorded

Results
46 patients were included. 18 (40%) were females and 28 (60%) were males. 21 (46%) had the TBNA procedure performed with a 19 G needle, while 25 (54%) with an 18 G. Diagnosis included 33 cases of sarcoidosis (72%), 2 cases of infection (4%), 2 other malignancies (4%). There were 9 patients in who were diagnosed with lymphoma, though only 6 of them were diagnosed with the combination of the LB, and the TBNA needles yielding a sensitivity of 67%, and a specificity of 100%. There were no significant adverse events with the use of these needles.

Conclusions
This use of LB needles is safe, though their use for the diagnosis of lymphoma requires further validation.

(72) Submission ID#407537

Endoscopic Management of Bronchopleural and Bronchoesophageal Fistula: A Case Series

Submission Type: Oral Presentation ONLY

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Bronchopleural fistulas (BPF) and bronchoesophageal fistulas (BEF) are pathologic communication between the bronchial tree and the pleural space in the former, and bronchial tree and oesophagus in the later. These communications are associated with high morbidity and mortality, and their management is challenging.

Methods
This is a retrospective review of medical records of patients with BPF and BEF undergoing endoscopic closure between November 2007 and October 2017 at a tertiary centre.

Results
During 10 year period, 4 patients with bronchopleural, and 4 with bronchoesophageal fistula were managed. In 3 patients, fistula was secondary to surgery. One patient developed fistula after radiofrequency ablation of neuroendocrine carcinoma with metastasis to lung, in 2 patients it was a complication of esophageal cancer, and 2 patients were spontaneous in origin. The spontaneous fistulas were due to tuberculosis (n=1), and esophageal candidiasis contributed by immune compromised state from human immunodeficiency virus infection (n=1). Post-surgery fistula occurred after esophageal cancer resection (n=1), pneumonectomy for soleal synovial sarcoma with lung metastasis (n=1), and lung cancer resection (n=1).
One patient was treated with wedge resection, 3 patients with bronchial and esophageal stent placement, 1 patient with tracheal stent placement, 1 patient with surgical repair and endobronchial valve, 1 with instillation of fibrin glue, and 1 with intercostal muscle flap, omental graft and tissue glue, followed by silicone stent.
In 4 (50%) patients, fistula was successfully closed by endoscopic technique with clinical and radiological improvement. In 1 (12.5%) patients it was successfully closed with wedge resection and stapling, and in 3 (37.5%) patients, condition did not improve despite esophageal and bronchial stent (n=1), tracheal stent (n=1), and surgical closure and bronchial stent (n=1).

Conclusions
Endoscopic techniques such as endobronchial valve, fibrin glue, and stent placement were effective in closing the fistula in patients without history of prior lung surgery. These techniques may be used safely in such patients. Management of BPF as a result of lung resection surgery remains challenging.

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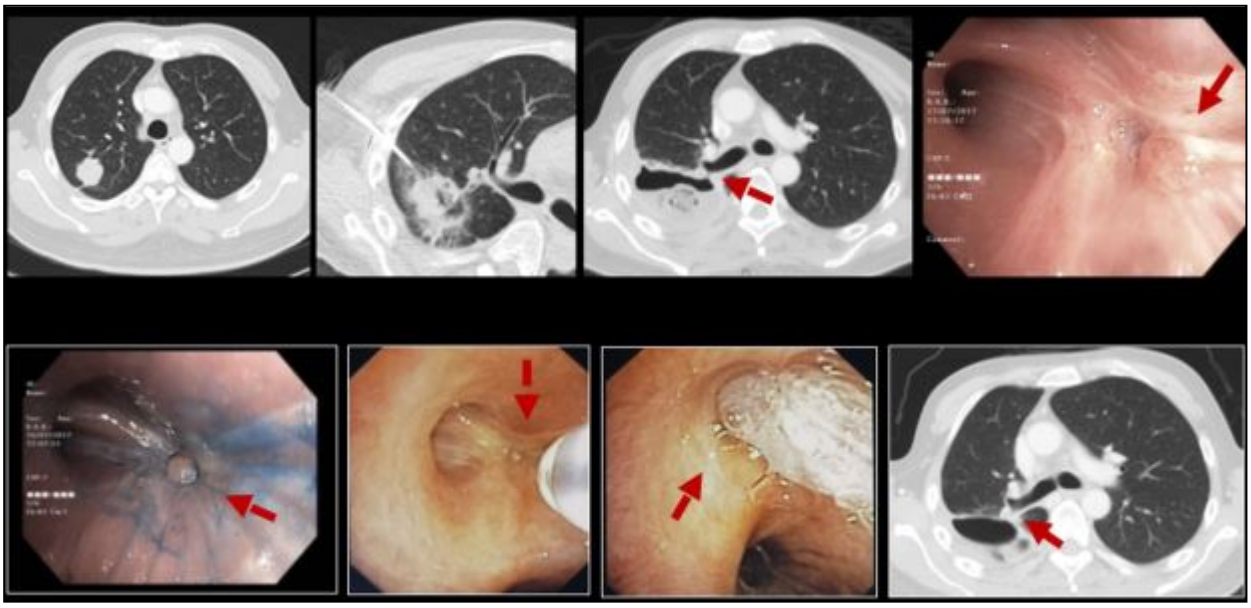

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(73) Submission ID#477992

Endoscopic treatment of adquired subglottic stenosis in a Souht American Pediatric Hospital: initial experience

Submission Type: Oral and Poster
Submission Status: Complete
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Interventional Pulmonology

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Background

INTRODUCTION: Adquired subglottic stenosis (ASS) in children is appears after an event of tracheal intubation, trauma or infection of the upper respiratory tract because this is the narrowest anatomic site of the larynx. As a therapeutic treatment, endoscopic dilatation and the application of mitomicyn has been proposed, leaving only grade 4 stenosis for surgical treatment. There are several classifications of subglottic stenosis, we use the classification of Myer and Cotton .

Methods

OBJECTIVE: Report initial experience about endoscopic treatment of ASS in a South American tertiary public pediatric hospital.
METHOD: Retrospective and cross-sectional study. Period: February/ 2014 to February/2018. The data were obtained from medical records. Inclusion criteria: patients with ASS categorized according to the Myer and Cotton classification. Exclusion criteria: patients without follow-up.

Results
RESULTS: of 378 respiratory endoscopies performed 18 (4.49%) corresponded to ASS, 4 of them were sent to surgical treatment because they had tracheostomy with two years or more of evolution that has been performed in another center. Patients with ASS grade 1 and 2: 10, grade 3: 4 (Table 2). We performed 25 subglottic dilatation procedures in 14 patients by rigid bronchoscopy, in some cases we supplemented the bronchoscopic procedure with insufflation of the balloon of an endotracheal tube. A patient had recurrence of the stenosis and he was treated by application of mytomicin with good evolution in the short-term follow-up. Complication of procedures: none. (see table)

Conclusions
CONCLUSION: Endoscopic treatment of ASS in a South American tertiary public pediatric hospital was effectiveness and safe. This form of treatment could be taken into account as an alternative for patients with ASS in grade 1, 2 and 3

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ENDOSCOPIC TREATMENT OF ADQUIRED SUBGLOTTIC STENOSIS IN CHILDREN

Case	Age (years)	Weight (Kg)	Grade	Dilatations	Mytomicin application	Follow-up (years)
1	0.6	7	1 (40%)	1	0	3
2	4	15	1 (40%)	1	0	3
3	0.2	3	2 (60%)	2	0	3
4	1	6	3 (75%)	3	0	2
5	0.8	7	2 (70%)	2	0	2
6	0.33	6.7	2 (60%)	1	0	2
7	1.7	8	2 (60%)	1	0	2
8	4	21	2 (60%)	1	0	2
9	4	13	3 (80%)	3	0	2
10	0.5	5	3 (80%)	3	0	2
11	1	7	1 (40%)	1	0	1
12	0.13	7.6	2 (70%)	2	0	1
13	0.83	7	2 (70%)	2	0	1
14	0.16	3.5	3 (80%)	4	2	0.6

(74) Submission ID#452022

Evaluation of the diagnostic value of electromagnetic navigational guided targeted-bronchoalveolar lavage (T-BAL) in the diagnosis of lung cancer

Submission Type: Oral Presentation ONLY
Submission Status: Complete
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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
The 2013 American College of Chest Physicians guidelines for evaluation of suspicious lung nodules recommends using electromagnetic navigation bronchoscopy (ENB) for lesions inaccessible by conventional bronchoscopy to avoid additional invasive procedures. Utilizing a variety of techniques including brushings, transbronchial biopsy, and fine needle aspiration (FNA), the diagnostic yield is approximately 80.3%. In an effort to increase diagnostic yield bronchoalveolar lavage (BAL) is performed with a reported sensitivity of 83% for detection of cancer. Targeted-BAL (T-BAL) is not a standard practice, with very limited data to support its implementation. The objective of this study is to estimate the sensitivity, specificity, and potential added diagnostic value of ENB T-BAL compared to the gold standard of tissue biopsy in the diagnosis of cancer.

Methods
This is an Institutional Board Review-approved prospective observational study of patients undergoing a protocolized ENB with radial probe-endobronchial ultrasound of peripheral lung nodules. All patients received forceps biopsies, triple needle brushings, core biopsy system (CBS) which substituted conventional FNA, T-BAL, and BAL uniformly in this order. If a biopsy could not be obtained by ENB, one was obtained by trans-thoracic needle aspiration (TTNA) or wedge biopsy. Patient demographics, size and gross description of the nodule, pathology, and microbiology results were collected. T-BAL was considered positive if pathology revealed cancerous or suspicious cellular atypia. Biopsy results were considered positive if any malignant cells were detected. Sensitivity of T-BAL was calculated as the number of true positives divided by all patients with biopsy proven cancer, and specificity was calculated as the number of true negatives divided by the total number of patients without a cancer diagnosis.

Results
Out of 43 consecutive patients, 25 had biopsy-proven cancer. 12 out of 25 cases of malignancy were detected by both T-BAL and BAL, 20 cases were detected by CBS, and 22 cases by forceps biopsy; the remaining 3 cases were diagnosed by TTNA or wedge resection. The sensitivity of both T-BAL and BAL was 48% with 100% specificity. Forceps biopsy had the highest diagnostic yield. There were no cases of confirmed cancer detected by T-BAL that were not detected by some other method.

Conclusions
This data suggests that the clinical utility of T-BAL is limited in the diagnosis of malignancy when compared to tissue biopsy and had no added yield to BAL alone. Larger scale studies should be performed to further examine the diagnostic utility of T-BAL.

(75) Submission ID#458982

Evaluation of transbronchial lung cryobiopsy freezing time, cryobiopsy size, histological quality and incidence of complications: a prospective clinical trial

Submission Type: Oral and Poster

Submission Status: Complete

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- Yes

Background

Transbronchial cryobiopsy (TBCB) is a novel way to obtain large lung biopsies without crash artifact. However, correlation of freezing time with cryobiopsy size and complications has not been evaluated in vivo.

The aim of this study is to reveal the correlation between cryobiopsy freezing time and size of cryobiopsy specimens, and evaluate incidence of complications and histological quality of the cryobiopsy specimens in different freezing times.

Methods
Individual cryobiopsies were obtained from patients who had suspected ILD based on clinical information, laboratory tests and HRCT with atypical ndings requiring lung biopsy. The freezing time was increased incrementally from 3 to 6s to achieve individual cryobiopsies.

Results
33 patients were enrolled and 142 transbronchial cryobiopsies were taken in this study. The mean size of the cryobiopsy ranged from 9.2±0.82 to 18.83±1.27 mm2. A significant positive correlation between increased freezing times and cryobiopsy sizes was observed in this study, but no statistical difference in diagnostic yield was observed between each group. A significant higher proportion (22.86%) of specimen swelling was observed when the freezing time exceeded 5s. Hemorrhage occurred in 103(72.54%) individual cryobiopsies and 4(12.12%) cases of pneumothorax were found by X-ray. As the freezing time prolongs, the risk of severe bleeding significantly increases and reaches the highest level at 5s.

Conclusions
The optimal freezing time begins with 3 or 4s, which is easily achievable and provides an adequate biopsy size whilst creating a safety threshold from complications.

(76) Submission ID#471989

Factors affecting the successful rigid bronchoscopic intervention in patients with post-intubation tracheal stenosis.

Submission Type: Poster Session ONLY
Submission Status: Complete
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Interventional Pulmonology

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- No

Background
It is known as the rigid bronchoscopic intervention is an excellent therapeutic option to replace surgery in post-intubation tracheal stenosis (PITS). However, it is difficult to predict its outcome. We aimed to evaluate factors

affecting the successful rigid bronchoscopic intervention in patients with PITS.

Methods
Data was collected retrospectively on 41 patients with PITS underwent rigid bronchoscopic intervention between October 2007 and July 2017 at St. Paul hospital. Successful therapeutic outcome was defined as maintaining the airway patency without stent insertion by bronchoscopic dilatation and surgery or stent reinsertion after stent removal.

Results
In 9 of 41 patients, airway patency was maintained by conducting only bronchoscopic dilatation without stent insertion. Successful stent removal was performed in 21 of 32 patients who received the stent insertion. The length of stenotic lesion was a significant factor to determine the therapeutic outcome not only in group without stent insertion ($p=0.005$) but also in group with successful stent removal ($p=0.022$) by subgroup analysis. However, there was no statistically significant factor to determine the therapeutic outcome in multivariate logistic regression analysis.

Conclusions
It is suggested that the length of stenotic lesion of tracheal stenosis may influence the successful therapeutic outcome of rigid bronchoscopic intervention. Further studies are needed to assess the significant factors affecting the successful rigid bronchoscopic intervention by including a larger number of patients.

(77) Submission ID#457168

Feasibility and Safety of Flexible Bronchoscopy-Guided Microwave Ablation in porcine lung:A new Image-guided invasive ablation for lung leisions

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Transbronchial lung biopsy is an important diagnostics for peripheral pulmonary lesions(PPLs), while the effective treatment under endoscopy is still lacked. A flexible microwave ablation(MWA) antenna for bronchoscopy was devised and to be evaluated the efficacy and safety in both in ex vivo and vivo porcine models.

Methods
A 15G flexible bronchoscopy-guided,water-cooled MWA antenna was used and institutional animal research committee approval was obtained. In ex vivo experminent, ablations(n=21) were performed at 40w, 50w, 60w, 70w, 80w, 90w, 100w in porcine liver and ablations(n=9) at 70w, 80w, 90w in porcine lung, all for 10 minutes by antenna punctured through tissue surface. Real-time temperatures of catheter and 10mm, 15mm, 20mm from catheter tip were measured. Ablations(n=6) were performed at 80w for 5 minutes by antenna located to lung through bronchoscopy. Long-axis diameter, short-axis diameter were measured gross pathology. In vivo experiment, ablations(n=12) were performed at 80w for 5 minutes by antenna located to lungs of six pigs

through bronchoscopy. All were divided into groups based on time sacrifice(group A, 24hours,n=6; group B, 4 weeks, n=6). Computed tomography were acquired perioperative, 24hours, 2weeks, 4weeks. Ablaiton zones were excised and sectioned for pathological examination.

Results

In ex vivo liver, the flexible MWA antenna got a ideal model,avoiding unnecessary damaging. In ex vivo lung, 80w, 90w in point 20mm could be over 60 and active time of 80w was 288±26 seconds, 90w is 216±39 seconds. While in case of ventilation and bronchus, the mean long diameter was 22.7±2.3mm, short diameter was 15.0±1.5mm under 80w for 5 minute. In vivo experiment,antenna was correctly originated ablation lesion. There were no complications during operation, sunch as pneumothorax.

Conclusions

The flexible MWA antenna was compatible for bronchoscopy and ablaion index was perfect. Bronchoscopy-guided, internally water-cooled MWA is a feasible and safe procedure that could become a potential interventional therapeutic tool in PPLs.

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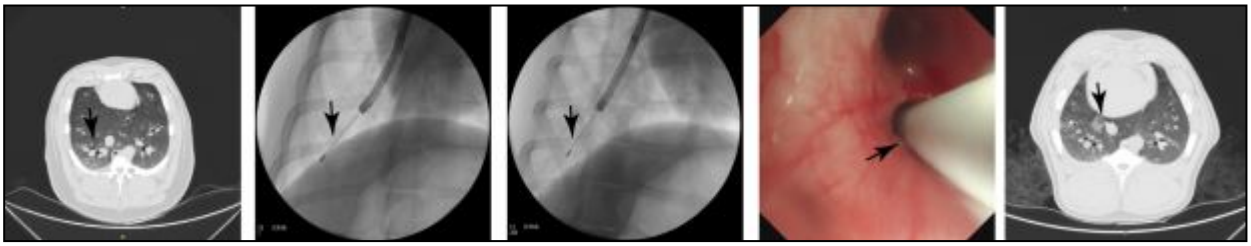

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(78) Submission ID#456308

Feasibility and safety of nasal route for linear endobronchial ultrasound : a single center experiences

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Wooho Ban – Division of Pulmonary, Critical Care and Sleep Medicine, The Catholic University of Korea

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Linear endobronchial ultrasound (EBUS) has proved to be a safe and accurate method for diagnosing mediastinal lymphadenopathy. Recently, a few studies establishing the feasibility through the nasal route insertion have been conducted in Canada, however there has been lack of reports in Asian population. This study aimed to investigate the feasibility and safety of linear EBUS using the nasal route in Korean population.

Methods

A retrospective analysis was conducted in Incheon St. Marys hospital, The Catholic University of Korea, between March 2015 and August 2017. Patients with mediastinal lymphadenopathy who underwent EBUS were included. In all subjects, insertion of EBUS was initially tried through the nasal route. The oral route was used in case of failed to approach through both nostrils. Clinical parameters, characteristics of the procedure, diagnostic accuracy were compared between the nasal and oral route insertion.

Results

Among 175 patients, nasal insertion of the EBUS were succeeded in 87.4% of patients (n=153). Twenty-two patients underwent the EBUS through oral route. There was no significant difference in nodal stations among two groups. Procedural time and dose of analgesics were similar. However, doses of sedative drug were significantly lower in the nasal group ($p = 0.006$). Complications associated with the route of insertion (epistaxis and pain) were similar. Severe epistaxis requiring bleeding control occurred in only one case in the nasal group (0.7%). Diagnostic yield were not significantly different between two groups (84.9% vs 78.4%, $p = 0.120$).

Conclusions

Nasal insertion of EBUS was relatively safe and feasible in Korean population compared with oral route insertion. Further studies are required to confirm safety and diagnostic accuracy for nasal insertion of EBUS in Asian population.

(79) Submission ID#457979

Flexible thoracoscopy: a new way to treat prolonged air leak after lung resection

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Prolonged air leak is a common complication after lung resection, causing increased in-hospital stay with increased costs and risk of infection and/or thrombosis.
In this paper we present a new technique in treating prolonged air leak with a flexible bronchoscope introduced into the pleural cavity.

Methods
Patients who had prolonged air leak lasting more than 10 days after lobectomy or bi-lobectomy have been enrolled.
With the patient completely awake, a flexible bronchoscope was inserted into the pleural cavity through the chest tube tract. The visceral pleura was adequately inspected, sourcing the site of the leakage. If it was identified, it was treated with apposition/introduction of fibrin glue. If a precise site of leakage was not recognized, the supposed area of leakage was treated covering it with glue and blood (100 ml).

Results
From July 2013 to August 2014, 8 patients had prolonged air leak and underwent flexible thoracoscopy 10-40 days after surgery.
The inspection of the pleural cavity revealed a broken bulla in 5 cases, in one case there was a patent terminal bronchiolus and in the remaining two patients there was a diffuse air leak.
In all the cases biologic glue was introduced/apposed; in 2 cases (where there have been adhesion lyses) even blood was apposed to further cover the lesion.
In 4 cases a complete resolution of the leakage was obtained after 1 (2 cases) and 3 (2 cases) days after the procedure. In the remaining 4 cases, air leak persisted for further 11-20 days, but reduced for more than 50%.
No side effects were noted.

Conclusions
Flexible thoracoscopy is a technique that could be used to treat prolonged air leak as a valid alternative to the procedures already in use.
It could be used in any patients, being managed in complete awake patients without any kind of anesthesia.

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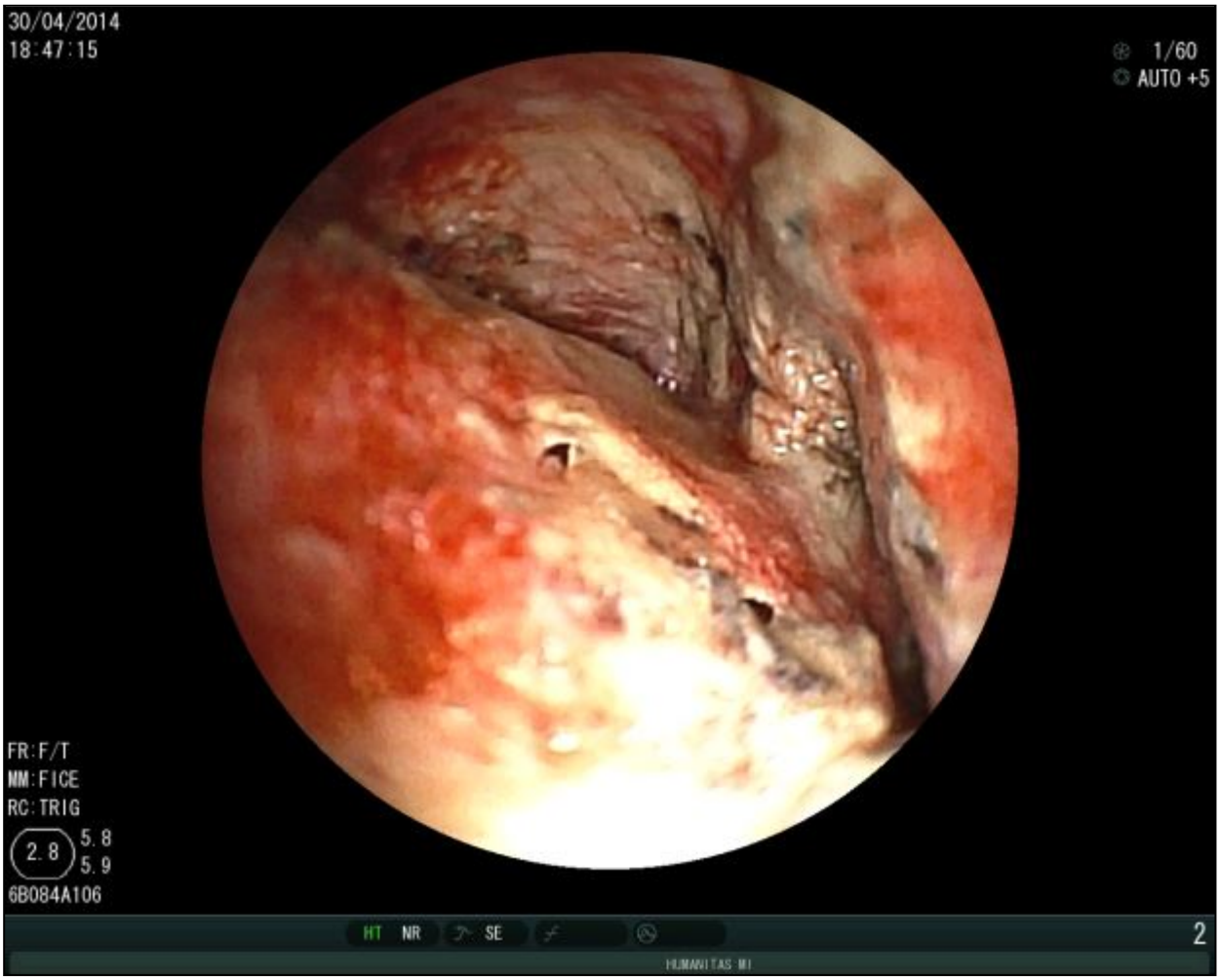

(80) Submission ID#459572

Fluorescein-aided probe-based confocal laser endomicroscopy (pCLE) for detection of lung cancer

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Kiyoshi Shibuya – Lung Cancer Treatment Center in JRC Narita Hospital, Chiba University Hospital

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

We investigated the capabilities of a pCLE that enables microscopic imaging of the tracheobronchial tree including peripheral lung tumor during bronchoscopy after administration of 10% fluorescein.

Methods

thirty-one patients with suspected lung cancer were underwent bronchoscopy with pCLE using fluorescein. pCLE probes were selected both Alveoflex probe 1.4mm in diameter for the peripheral lung tumor and Gastroflex probe 2.5mm in diameter for the central airways tumor. Following localization of peripheral lung tumor with endobronchial ultrasonography-guided sheath (EBUS-GS) and of central airways tumor with white light, narrow band imaging (NBI) and autofluorescence imaging (AFI) bronchoscopy, pCLE was performed followed by bronchoscopic tumor biopsy. Histological examinations using haematoxylin and eosin staining were made of biopsied specimens. Analyzed pCLE images were compared with the corresponding histological examinations.

Results

Of the 31 patients, 24 lung cancers and 3 inflammatory tumors were identified pathologically. In adenocarcinoma, confocal images demonstrated large, irregular, dark or black tumor cells were visible and some of abnormal structures were also similar to acinar and papillary differentiated types. In squamous cell carcinoma, large, dark or black, polymorphic tumor cells showed increased cellular densities with irregular stratified patterns and capillary blood vessels, tumor vessels with flow of red blood cells also visible. Of 24 pathological diagnosed lung cancers, large, dark or black, tumor cells were visible in 21 lesions.

Conclusions

pCLE was useful for the detection malignant tumor cells during bronchoscopy in real time. This novel technology has an excellent potential to provide in vivo diagnosis during bronchoscopic examinations.

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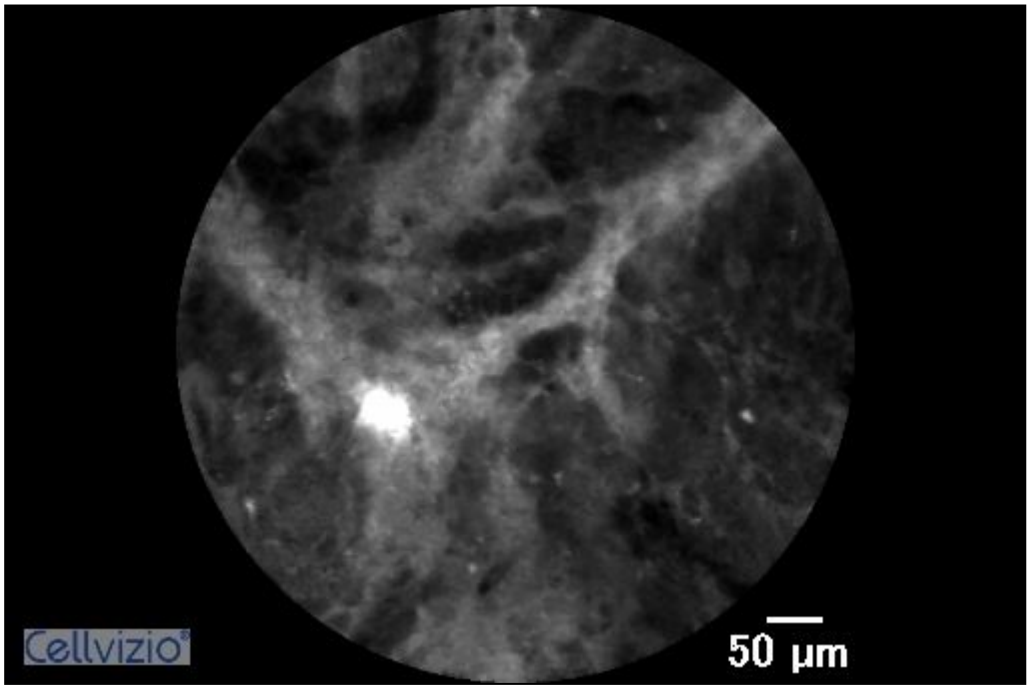

(81) Submission ID#459600

Fluoroscopic Navigational Bronchoscopy
Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Krish Bhadra – Rees Skillern Cancer Institute

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Disclosure:
Disclosure Status: Complete
Disclosure: Does Disclose
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Auris Surgical Robotics (Consultant); Biodesix (Consultant); BodyVision (Consultant, Grant/Research Support); Boston Scientific (Consultant); Medtronic ILS (Consultant, Grant/Research Support); Merit Endotek (Consultant); Veracyte (Consultant)

Interventional Pulmonology

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- Yes

Background
Navigational bronchoscopy is dependent on a pre-procedural CT scan of the chest accurately registering with the patient's anatomy. Malregistration or CT-to-body divergence may occur due to multiple factors including dynamic changes in the lesion, suboptimal scans, respiratory motion, atelectasis, and positional changes with instrumentation. A novel technology, the superDimension navigation system version 7.2 with Fluoroscopic Navigation Technology (Medtronic, Minneapolis), allows for real-time local registration using standard fluoroscopy to correct for CT-to-body divergence. This study evaluates the initial experience with the first 10 fluoroscopic navigation bronchoscopies. We evaluated correction of CT-to-body divergence, accuracy with radial endobronchial ultrasound (r-EBUS) and cone-beam CT tool-in-lesion, adequate tissue and complications.

Methods
Using the Medtronic superDimension navigation system, the patients anatomy is registered to a reconstructed 3D map. Following a planned pathway, the bronchoscope is wedged. The navigation catheter is then advanced within 2.5 cm of the lesion. A standard fluoroscopy sweep is performed over the area of the target

lesion. A local registration is performed in real time to correct for CT-to-body divergence. When the navigation catheter is re-aligned to the lesion, the locatable guide is removed, and r-EBUS confirmation is performed. Then a biopsy tool is inserted. The bronchoscope is secured into position using NeuWave and custom flex grip bronchoscopy holders. Intra-operative CBCT (DynaCT, Siemens Zeego) imaging confirms the current position of the tools and its relationship to the lesion.

Results

A total of 10 patients with 11 peripheral lung lesions (PLLs) underwent fluoroscopic navigation bronchoscopy. The average age of patients was 68±5, 50% male and the average size of the PLLs was 21 mm±9, range 6-40 mm. RUL/LUL PLLs accounted for 92% of lesions. 81% PLLs were located in the outer third of the lung. 10 of the 11 PLLs were able to undergo CT-to-body correction with fluoroscopic navigation. Average correction was 18.3±10.1 mm, range 0.5-30.5 mm. Correction could not be performed in one patient due to fluoroscopic magnetic interference. R-EBUS confirmation and CT tool-in-lesion confirmation was achieved in 100% of patients. Adequate tissue obtained in 91% of PLLs. 8 were positive for malignancy, 1 aspergilloma, 1 with inflammatory changes (CT-FNA also confirmed inflammatory changes) and one non-diagnostic bronchoscopy. No complications occurred.

Conclusions

ENB using fluoroscopic navigation technology demonstrates excellent safety and cross-correlation with radial probe EBUS and CBCT tool-in-lesion confirmation (100%) and 91% with adequate tissue. Overcoming CT-to-body divergence with real-time registration represents a promising advancement for navigational bronchoscopy.

(82) Submission ID#459763

Foriegn body presenting as pneumothorax

Submission Type: Case Report

Submission Status: Complete

Submitter: S Santhakumar – Kovai Medical Center&Hospital, Coimbatore

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Foreign body aspiration in adults is rare. A tracheobronchial foreign body presenting as spontaneous pneumothorax is even rare. Early diagnosis and appropriate retrieval in time is mandatory otherwise it can be lethal. we report a case of bronchial foreign body presented as pneumothorax and its bronchoscopic retrieval

saved the patient.

Case Report

A 70 years old gentleman was hospitalised with sudden onset breathing difficulty ,right sided chest pain and cough for 2 days. At the time of admission he was in respiratory distress, hypoxic, tachypnoeic, tachycardic and normotensive. clinical examination revealed right sided pneumothorax and chest X ray confirmed that. He was managed with Inter costal drainage. Even though his symptoms improved partially, the lung has not fully expanded on X- ray and it showed right lower lobe collapse. HRCT lungs showed complete occlusion of right bronchus intermedius by a soft tissue lesion. Flexible bronchoscopy confirmed the same and it was a brownish lesion with granulation around it with minimal bleed on biopsy. Histopathology showed granulation tissue. While retrospectively asked, patient gave a history of aspiration of a betel nut recently. Foreign body was recovered totally in small pieces using Cryo probe through flexible bronchoscope. Immediately the right lower lobe expanded well as the patient also improved symptomatically.

Conclusion

High suspicion and early identification was very helpful in this patient. Possible mechanism of pneumothorax could be a ball valve obstruction by foreign body and trapped air in the lower lobe and cough induced alveolar leak. This is one of a very few cases reported in literature as pneumothorax as a presentation of aspirated foreign body.

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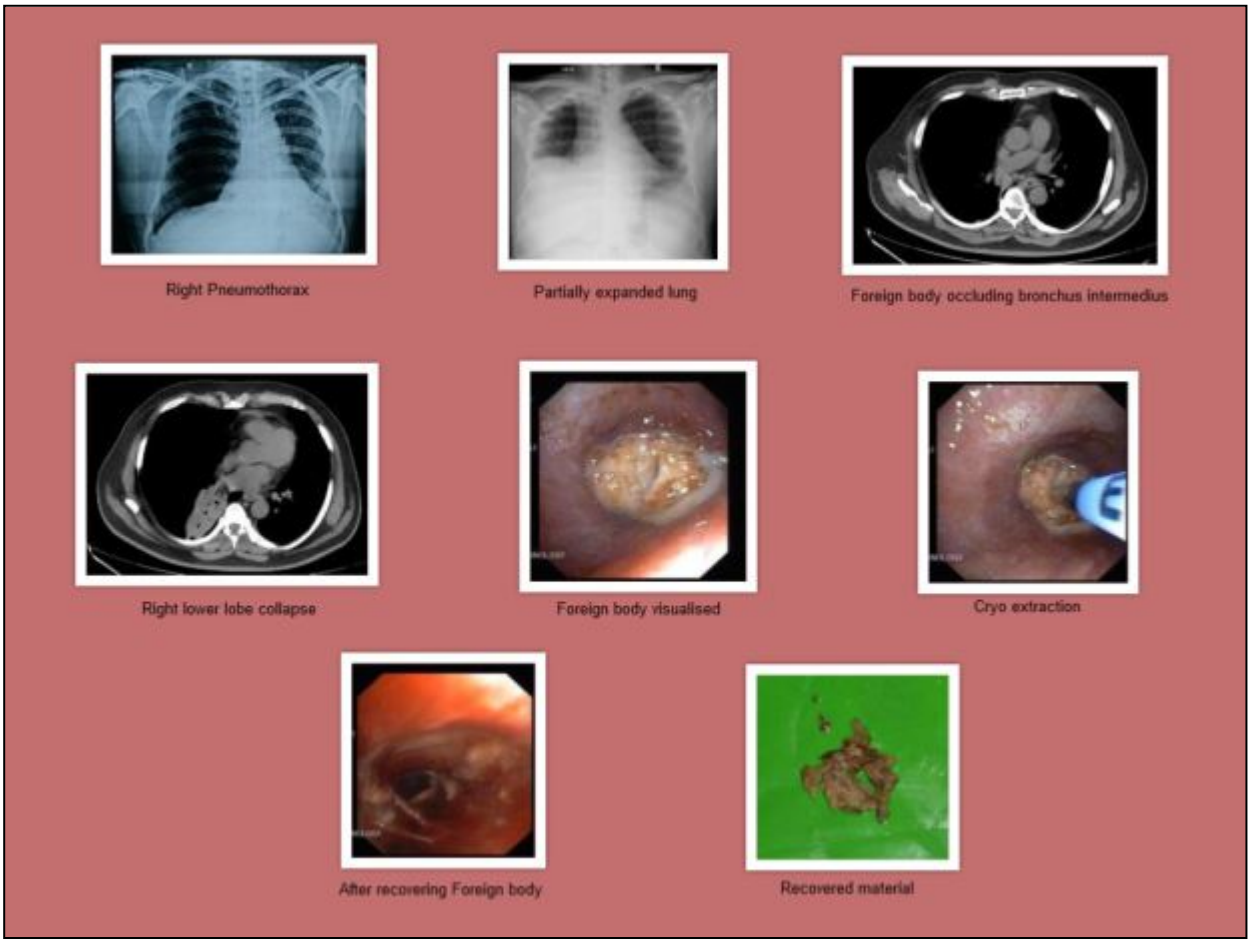
Right Pneumothorax
Partially expanded lung
Foreign body occluding bronchus intermedius
Right lower lobe collapse
Foreign body visualised
Cryo extraction
After recovering Foreign body
Recovered material

(83) Submission ID#471449

Hard to Swallow: A Mediastinal Hematoma Causing Esophageal Compression After Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration

Submission Type: Case Report
Submission Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Mediastinal hematomas post EBUS-TBNA are rare and have only been previously reported twice. Both occurrences include tracheal compression. Mediastinal hematomas post EBUS-TBNA causing esophageal compression have not previously been reported.

Case Report
A 66 year old female with aortic and mitral valve replacements on chronic anticoagulation was referred to pulmonary clinic for ongoing fevers, weight loss, and dyspnea on exertion. A computed tomographic (CT) angiogram of the chest revealed mild left hilar and mediastinal lymphadenopathy. Given her clinical symptoms

a bronchoscopy with endobronchial ultrasound guided biopsies was planned. Warfarin was held in preparation for a bronchoscopy. On the day of her procedure the INR was 1.6. She underwent bronchoscopy with endoscopic ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) of station 10L and 7 lymph nodes. The procedure was completed without complication and she re-started her anticoagulation the following day. Six days later she presented to the emergency department due to worsening nausea and vomiting. Her labs were notable for a supra-therapeutic INR of 5.6. CT was completed showing a subcarinal mass causing leftward shift of the esophagus with significant external compression. The subcarinal mass was most consistent a hematoma in the setting of supra-therapeutic INR and recent bronchoscopy with EBUS-TBNA. She was seen by thoracic surgery who recommended holding anticoagulation for 24 hours. Repeat imaging the following day, showed a stable subcarinal hematoma after which anticoagulation was resumed. A follow up CT, six months later demonstrated complete resolution. The patient was ultimately diagnosed with anaplastic lymphoma and treated with cisplatin based chemotherapy.

Conclusion

Herein we describe the first reported case of mediastinal hematoma post EBUS-TBNA causing esophageal compression. EBUS-TBNA is a safe procedure, with complications occurring only 1.2% of the time and hemorrhage occurring only 0.68% of the time1. Mediastinal hematomas typically are caused by traumatic vascular injury or ruptured aortic aneurysms, rarely caused by spontaneous non-traumatic causes2. Mediastinal hematomas post-EBUS-TBNA have only been reported two other times in the literature. Both times they caused compression of the trachea, one through unintentional puncture of an abnormally located bronchial artery and another related to tracheal intramural hematoma at a 4R site puncture4, 5. To our knowledge mediastinal hematomas post EBUS-TBNA causing clinically significant esophageal compression have not been reported. We attribute the development of this hematoma to supra-therapeutic anticoagulant levels post diagnostic procedure. EBUS-TBNA is a safe procedure; however in those patients with the need for anticoagulation, closer monitoring and multidisciplinary discussion should be undertaken.

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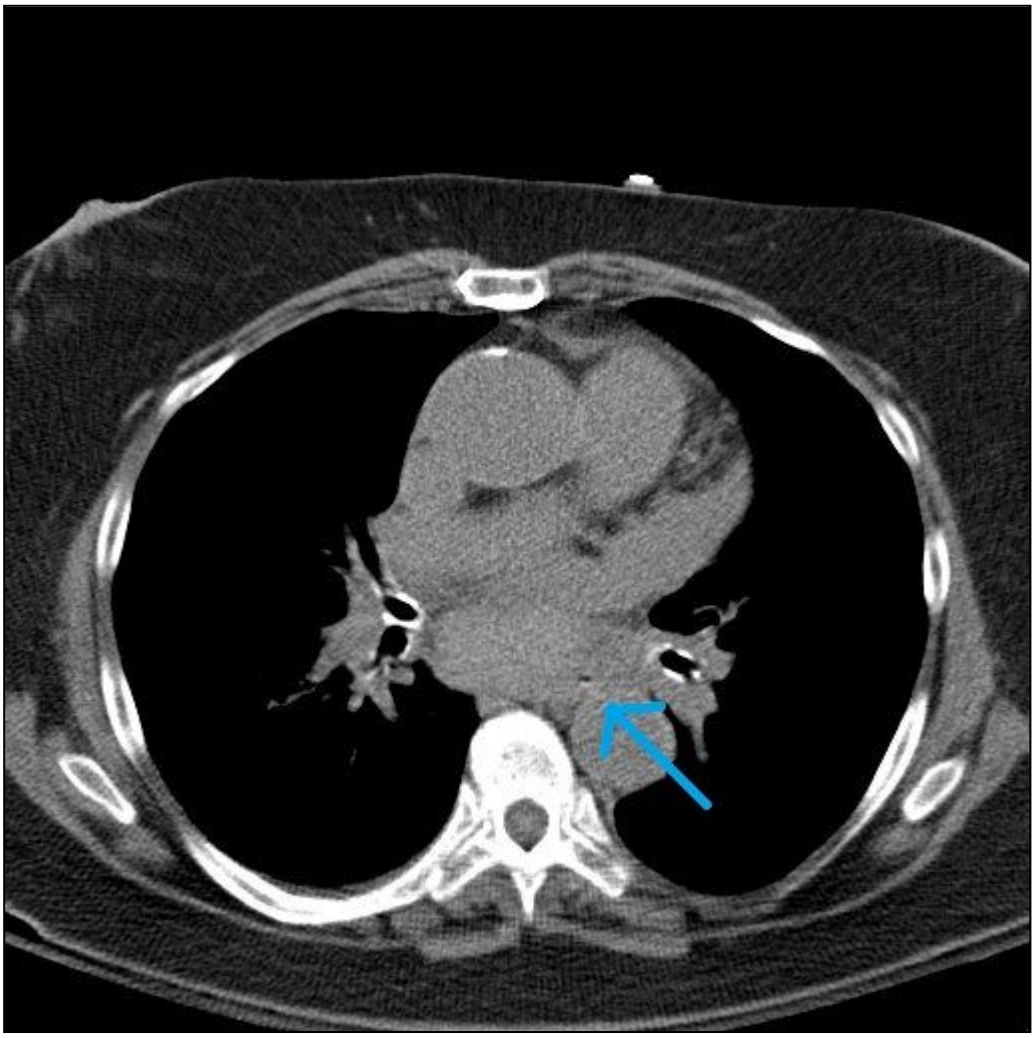

(84) Submission ID#458749

How many groups of the mediastinal lymph nodes should be punctured during EBUS in cases of the mediastinal lymphadenopathy?

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Igor Vasilev – Saint-Petersburg Research Institute for phthisiopulmonology

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Interventional Pulmonology

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- Yes

Background
Despite the markable background of EBUS in cases of mediastinal lymphadenopathy, the questions regarding technical aspects of the procedure are not resolved till now. The aim: to investigate the sufficient amount of groups of the mediastinal lymph nodes, which should be punctured to the identification of etiology of the mediastinal lymphadenopathy.

Methods
Design: prospective randomized trial from January 1, 2016, till December 31, 2017
Inclusion criteria: patients over 18 with mediastinal lymphadenopathy and signed informed consent.
Methods: By randomization, patients were divided into two groups: G1 - the EBUS puncture of the only one group of mediastinal lymph nodes, G2 - the puncture of more than one group. The adequacy, sensitivity were compared in both groups.

Results
50 patients were enrolled in the trial, the G1 - 23, the G2 - 27. The median age: 46+\-16, sex ration - 23 (46%) males and 27 (54%) female. The structure of the final diagnosis: Sarcoidosis - 28 pts (56%), tuberculosis - 5 pts (10%), lung cancer - 6 pts (12%), no pathology - 8 pts(16%), non-specific inflammation - 3 pts (6%). The median number of punctions per one group was 2,84+\-0,95. The groups were equal by sex, age, diagnosis and amount of punctions per lymph nodes station.
The total adequacy 92%; in G1 was 82%, G2 - 96%. The sensitivity 62%, 47,8%, 74%, the overall, G1, and G2 respectively. We did not find the significant difference in G1 vs. G2 neither in the adequacy, no in the sensitivity.

Conclusions
According to statistical results, it is not proven necessary to perform a biopsy in more than one group of mediastinal lymph nodes. But additional trials are required.

(85) Submission ID#477033

Impact on Hemodynamics and Blood Gas Analysis in Patients Undergo General Anesthesia with Tracheal Intubation or Rigid Bronchoscope Insertion during Transbronchial Lung Cryobiopsy

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Li-ya Lu – First Affiliated Hospital of Guangzhou Medical University, Guangzhou, Guangdong, China

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Administration of general anesthesia either with a endotracheal tube or through a rigid bronchoscope is a recommendation to perform transbronchial lung cryobiopsy, however, the impact on hemodynamics and blood gas analysis in patients by both intubation remains unknown.

Methods
Twenty-six ASA physical status I to patients undergoing selective procedure of transbronchial lung cryobiopsy were randomly assigned into 2 groups. All the procedures were performed under general anesthesia. Patients (4 males and 9 females) in T group underwent general anesthesia intubated with endotracheal tube during the procedure, while the others (3 males and 10 females) in RB group was intubated through a rigid bronchoscope. After induction of general anesthesia, patients in T group were conventionally performed with intermittent positive pressure ventilation(IPPV), while those in RB group were ventilated with high frequency jet ventilation (HFJV). The vital sign data, such as HR, MAP and SpO2, were documented by a continuous electrocardiographic monitoring (data show in Table 1). Besides, peripheral arterial blood samples were respectively drawn at T0, T3, T5 and T7. (data show in Table 2).

Results
Compared with T group, we observed a significantly faster HR of RB group at T4,($p<0.05$), a significantly higher MAP of RB group at T4, T5 and T6 and a significantly lower PH and higher PaCO2 of RB group at T3, T5. However, we found a non-significantly difference in PH and PaCO2 at T7, and a non-significantly difference in anesthesia recovery time in both groups. Fortunately, no complications, such as severe arrhythmia, cardiac dysfunction, were found during the procedure.

Conclusions
Administration of general anesthesia with endotracheal tube is a more reliable and available way to maintain hemodynamic stability and reduce the risk of CO2 rentention than those through a rigid bronchoscope during

the procedure of transbronchial lung cryobiopsy.

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Table1 Vital Sign Data in Two Groups

Parameter	Groups	T0	T4	T5	T6
MAP	T	66.7±10.1	75.7±12.3	73.3±12.4	70.4±10.6
	RB	66.2±11.1	81.2±9.1	87.1±18.2	85.9±18.3
HR	T	68.9±8.8	75.7±12.3	79.0±13.2	71.0±11.2
	RB	65.7±7.2	95.1±18.6	79.0±14.7	72.7±8.4

T0 before general anesthesia, T1 1min after general anesthesia, T2 at the beginning of the procedure, T3 5min after the procedure, T4 10min after the procedure, T5 at the end of the procedure, T6 at the time of extubation, T7 5min after extubation.

Table2 BGA data in Two Groups

Parameter	Groups	T0	T3	T5	T7
PH	T	7.40±0.03	7.34±0.06	7.35±0.06	7.34±0.04
	RB	7.38±0.03	7.26±0.07	7.23±0.08	7.34±0.05
PaCO2	T	41.8±3.7	48.5±9.0	46.1±10.0	44.2±4.5
	RB	42.3±4.0	61.4±10.3	66.2±13.5	45.7±5.7

T0 before general anesthesia, T1 1min after general anesthesia, T2 at the beginning of the procedure, T3 5min after the procedure, T4 10min after the procedure, T5 at the end of the procedure, T6 at the time of extubation, T7 5min after extubation.

(86) Submission ID#409400

Indications for performing flexible bronchoscopy in low income countries : Sudan an example

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Omer Elhag – head department of internal medicine- Alneelain university

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Due to easy performing, patients comfort and documented safety as an outpatient procedure flexible bronchoscopy has had replaced rigid bronchoscopy , here we reported our 10 years experience at Shaab teaching hospital Khartoum-Sudan as an example of low income country

Methods
This was retrospective study of all patients underwent FOB between 2006 and 2016 in tertiary care hospital, demographic data and indications of FOB, and annual trend were studied from medical records

Results

Results:

A total of 456 bronchoscopies were performed during this period ,majority of patients (42%)are of age group more than 60 years, male to female ratio of 1,2:1,there is increase of number of bronchoscopy performemed from 19 cases in 2006 to 70 cases 1n 2016 an absolute increase of 368%, the most common indication for FOB was suspected carcinoma of bronchus lung mass on chest Xray and chest CT scan357 (78%) followed by hemoptesis 39(8%), pleural diseases 28(6%),lung collapse26 (5%) and Tuberculosis 5(1%),tracheal stenosis 1(0,2%) no deaths encountered during the study in patients undergoing Bronchocopy.

Conclusions

FOB is increasingly being performed in the diagnosis of respiratory disorders and is a safe outpatient procedure. Although bronchogenic carcinoma remains a common indication for performing FOB, benign conditions such as pulmonary infections like tuberculosis constitute important indications in the Sudan.

Key wards: bronchocoscopy, lung cancer, hemoptesis, tuberculosis, pleural effusion

(87) Submission ID#459267

Interventional bronchoscopy for the treatment of surgery related complications

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Hermann Tonn – KRH Siloah Hannover Pneumology

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Disclosure Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Surgical intrathoracic interventions (trachea-bronchial-lung, gastric pull-up) can lead to severe complications like tracheo-bronchial stenosis and/or tracheal-bronchial malacia and diverse types of tracheo-bronchial fistulas. If surgical re- interventions are not feasable or have been already performed in vain interventional bronchoscopy offers several options of treatment. We reviewed patients from July 1993 till February 2018 who were referred from surgical departments to our department.

Methods

Interventional bronchoscopies of 20 patients (3 women, 17 men, mean age 51,9 years, range 18 80 years, July 1993 till February 2018) were restrospectively analyzed. The surgery related complications consisted of stenosis/malacia (5 patients) and various kinds of fistula in different locations (15 patients). Bronchoscopic interventions used stents of different types (Dumon silicone stent, Freitag dynamic stent) for the treatment of stenosis and malacia. For the closure of fistulas stents (silicone, metallic stents, Ultraflex®, aerstent®) Watanabe spigots and Amplatzer vascular plugs were inserted. There were early stenosis and fistulas (within 4 weeks after the first operation) and chronic lesions.

Results

From 20 patients 12 could be successfully treated. 3 out of 9 (1 chronic ventilatory insufficiency before operation) patients could be weaned from the ventilator. In the subgroups all 5 patients with a stenosis could be treated successfully. Whereas only 7 out of 15 patients with fistulas could be successfully treated. Especially in the early fistula group of the right main bronchus after pneumonectomy not a single patient out of 4 could be successfully treated. There were two major reasons: the patients were in a critical status, so it was ment to be a rescue intervention and secondly the sealing was not complete in a single patient, because the exact fitting material was not available. On the other hand two patients with chronic fistulas after right pneumonectomy could be sealed with vascular plugs

Conclusions

If surgical re-intervention is no further option for the treatment of surgical related complications interventional bronchoscopy can be a possible alternative. Stents, spigots and vascular plugs are chosen depending on the type of lesion and location. The choice and the availibility oft the material is important. Anatomical changes due the surgical procedure are challenging, because the available devises have standardised sizes which might not fit exactly for the existing bronchoscopic proplem.
In future treatment could be probably improved, if customized devices could be used, which should be available in a very short time, e.g by 3 d printing on site.

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Interventional bronchoscopy for the treatment of surgery related.pptx

(88) Submission ID#459575

Interventional bronchoscopy in patients with esophageal carcinoma invading major airways

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Spasoje Popevic – University Hospital of Pulmonology, Clinical Center of Serbia, Belgrade

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Bronchoscopic intervention can provide immediate relief of symptoms and serve as an opportunity for additional treatment in patients with esophageal carcinoma causing major airway obstruction.

Methods

In period from 01.01.2017 to 31.12.2017.. we performed 17 bronchoscopic interventional procedures in patients with esophageal cancer causing central airway obstruction such as: mechanical desopstruction (17 pts), stenting (5 pts), argon plasma coagulation (n = 13). Cryoextraction was done in 3 pts only for extraction of necrotic debris after mechanical debulking. In 3 patients esophageal stent was placed.

Results

Endoscopic finding was intraluminal tumor and infiltration (5 pts) extrinsic compression only (3 pts) and combined lesions (9 pts). Tracheal invasion was found 10 pts. One patient with both esophageal and tracheal stent placed developed fistula.
Additional anti-cancer treatment was given in 12pts. The median survival time was 4,8 months.

Conclusions

Survival was better in selected patients with an intact proximal airway and concurrent additional treatment. Successful palliation was achieved in 94% of patients (defined as more than 50% of the airway lumen patent after the procedure).

(89) Submission ID#454303

Interventional bronchoscopy treatment for benign scarring tracheal stenosis: efficacy and influence factors

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Ting Wang – Beijing Tian Tan Hospital Capital Medical University

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Although interventional bronchoscopy is an effective and important therapeutic modality for scarring airway stenosis, the efficacy of interventional bronchoscopy differs among different studies, and factors associated with the efficacy of interventional bronchoscopy is less clearly understood. At the same time, most patients needed multiple and repeated bronchoscopy interventions. It is necessary to ascertain associated factors for restenosis and at what point after first interventional bronchoscopy treatment, clinicians should raise the concern of restenosis remain issues that inadequately addressed. In this study, we investigated the efficacy of interventional bronchoscopy for scarring airway stenosis in a patient cohort. The clinical factors associated with the achievement of clinical success are specially evaluated and the variables associated with airway restenosis are also addressed.

Methods
Between January 2013 to December 2016, 308 patients with scarring airway stenosis from 18 tertiary hospitals who received interventional bronchoscopy were retrospectively reviewed. The variables used in analysis included sex, age, cause, site, length, degree and type of stenosis, dyspnea index, anesthesia method and interventional modalities. A multivariate logistic regression model was used to determine the independent factors for efficacy of interventional bronchoscopy treatment. A multivariate Cox regression analysis was used to evaluate the multivariate factors affecting maintained patency after interventional bronchoscopy.

Results
The results showed that clinical stable rate is 67.8% (204/301), and clinical failure rate is 32.2% (97/301). The average treatment period is 100.0±92.31days. The results showed causes of stenosis (odds ratio [OR] 0.708; 95% confidence interval [CI], 1.1133.703, P = 0.021)stenosis location (OR 0.749; 95% CI, 1.2473.584, P = 0.005), length of stenosis (OR 0.535; 95% CI, 1.0392.809, P = 0.035) and dyspnea index assessment (OR 1.282; 95% CI, 2.3685.484, P = 0.000) were independent predictors. The mean maintain patency time after first interventional bronchoscopy treatment was 26.9±30.9 days. In the multivariate cox regression model, site of stenosis (OR 0.407; 95% CI, 1.2661.781, P=0.000), grade of stenosis (OR 0.366; 95% CI, 1.0292.021, P=0.033), anesthesia method (OR -1.398; 95% CI, 0.1510.404, P=0.000), interventional modalities (OR -0.561; 95% CI, 0.4380.743, P=0.000) were independent predictors associated with the maintain patency time after first interventional bronchoscopy treatment.

Conclusions
Interventional bronchoscopy is a useful and safe treatment method for the disease. The causes, location, length of stenosis and dyspnea index were independent predictors for efficacy of interventional bronchoscopy treatment. The site, grade of stenosis, anesthesia method and interventional modalities were independent predictors associated with the maintain patency time after first interventional bronchoscopy treatment.

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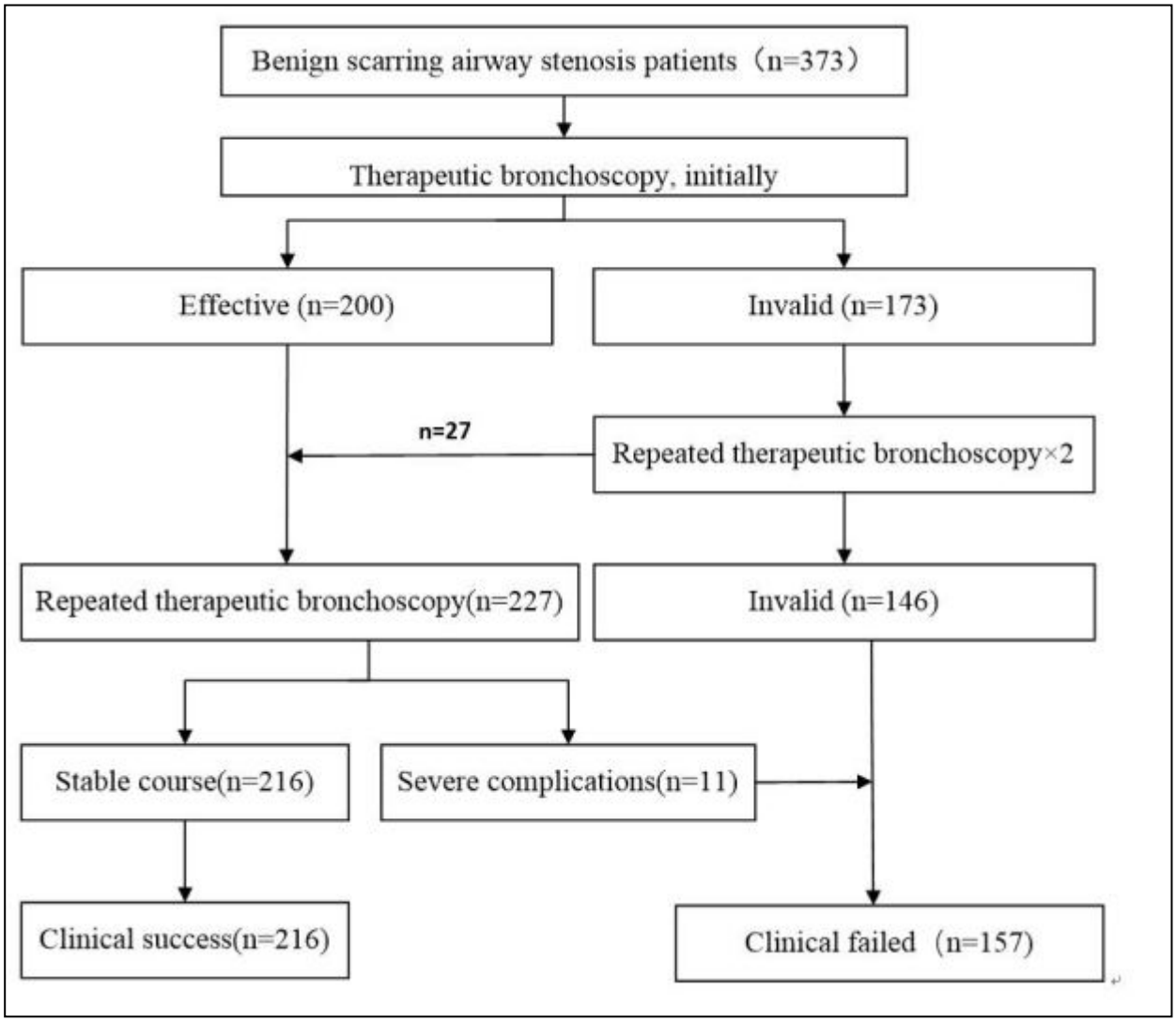

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1 Interventional bronchoscopy treatment for scarring tracheal stenosis .pptx

(90) Submission ID#458092

Interventional Pulmonology in the Era of Precise Medicine
Submission Type: Oral Presentation ONLY
Submission Status: Complete
Submitter: Guangfa Wang – Peking University First Hospital

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No financial relationships or conflicts of interest.

Interventional Pulmonology

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- No

Background
Modern medicine has evolved to an era of precise medicine which aims at providing the customization of healthcare to the individual patient. As a new medical concept and model, it has far away from realization but the first light has appeared in a few diseases. As a sub division, interventional pulmonology has more jobs to do for the precise respiratory medicine. The development of precise medicine will be based on huge clinical information and biobanks.

Methods
Besides blood and urine, samples from bronchoscopy can be important source of biobanks for respiratory diseases. The samples from brushing, washing, BAL and different kinds of biopsy can be used for genomics, transcriptomics, epigenomics or metabonomics analysis. It will provide a strong support to the development of precise respiratory medicine. Lung cancer will remain the biggest challenge to pulmonologist in the foreseeable future. Nowadays, technologies of endoscopy and interventional pulmonology make us see the light of hope on precise diagnosis and treatment of lung cancer. Autoflurorescence bronchoscopy, NBI and Raman spectroscopy may help us to find precancerous lesions or early cancer on visible sites. OCT and EBUS may reveal the depth of invasion of cancer. Early peripheral lung cancer can be diagnosed by EBUS, EBN and virtual navigation assistant biopsy. They have changed the situation of early lung diagnosis but in

the future, may change the precise treatment. It is rational to use interventional pulmonological modalities to treat very early lung cancer just like the present treatment of early GI cancer.

Results

Besides malignant diseases, bronchoscopic and interventional techniques may contribute to clinical precise diagnosis and treatment of infectious diseases and interstitial lung diseases although we are still at the starting point. We should also use the idea of precise medicine to guide clinical practice of interventional pulmonology. The precise evaluation should be performed before central airway stenosis be treated. Interventional therapies to COPD should be studied intensively to answer who is the best candidates, the relationship between the phenotype and the outcome, and the lung term effects and complications. Bronchial thermoplasty is also facing the similar questions.

Conclusions

In summary, bronchoscopic and interventional pulmonology techniques can boost precise respiratory medicine greatly. We should also use the standard of precise medicine to guide interventional pulmonology practice and research.

(91) Submission ID#450475

Investigation on the Status of Bronchoscopy Work in China

Submission Type: Poster Session ONLY

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

To investigate the clinical practice and development of bronchoscopy in China and provide evidence for the optimization of application of bronchoscopy.

Methods
Three hundred and nineteen tertiary, secondary and specialty hospitals were surveyed via electronic questionnaires, including details of practice of bronchoscopy.

Results
The median period of application of bronchoscopy examinations and therapeutic bronchoscopy was 19.7 years and 7.4 years, respectively. Among all hospitals, the rate of practice of bronchoalveolar lavage, transbronchoscopic lung biopsy, transbronchial needle aspiration and balloon dilation was 93.7%, 99.4%, 64.9% and 69.6%. Furthermore, those techniques were more frequently performed in hospitals with the higher tier ($P<0.05$). On average, 155.2 bronchoscopy examinations and 28.4 interventional therapies via bronchoscopy were implemented per month in one hospital. The mean area of the examination room for bronchoscopy was 122.7m2. About 2.2 examination rooms were exclusively for bronchoscopy. Moreover, 7.4 doctors and 4.8 anesthetists were allocated for implementation of bronchoscopy per hospital.

Conclusions
The development of bronchoscopy in China was from top hospitals to primary ones and from specialty hospitals to general ones. More interventional therapies and bronchoscopy examinations were performed in tertiary hospitals than secondary hospitals. Additionally, more skilled doctors and anesthetists were engaged in diagnostic and therapeutic bronchoscopy in tertiary hospitals. Nevertheless, there are shortages in allocations of doctors and instrument and guidelines for diagnostic and therapeutic bronchoscopy are in urgent need in China.

(92) Submission ID#459762

Is it possible to identify phenotype of responder patient to bronchial thermoplasty treatment in severe asthma and the correlation with the number of activations performed during the procedure ?

Submission Type: Poster Session ONLY
Submission Status: Complete
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Interventional Pulmonology

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- No

Background

Bronchial thermoplasty (BT) is a non-pharmacological procedure for the treatment of severe asthma in 18-year old patients or older. This minimally invasive procedure is expected to be flanked by standard asthma drug treatment, thus favoring better control of the symptoms of the disease and an increase in the quality patients' life with severe asthma. Since asthma is a disease involving small airways and BT only reaches airways > 3 mm, it has been postulated that the contracting of the distal airways is regulated by pacemakers placed in the proximal airway and that destruction of these, as a result of BT, reflect on small airways. However, a rigorous selection of patients is essential, identifying those who actually do not control the disease despite full adherence to adequate treatment, that do not have comorbidity, environmental and / or

occupational triggers that could affect the therapy in progress.

Methods
It is retrospective study in which 11 female patients aged 22-77, BMI 24-36, suffering from severe steroid-dependent asthma, undergoing BT treatment (whith Alair bronchial thermoplasty system, Boston Scientific, NSW, Australia) between 2012 and 2017, were evaluated. The data obtained reflect the phenotypic characteristics of patients, as well as the total number of thermal energy applications for each of them and the possible correlation between these factors and the post-procedural clinical response, defined as the almost complete suspension of systemic steroid therapy (patient responders).

Results
The data obtained, even if few, identify a specific patients phenotype that potentially responds to BT treatment (carried out according to the current protocol): women, overweight/obese, with few comorbidity, at not advanced age and in which its possible to deliver a large number of thermal energy at the end of the 3 therapy sessions.

Conclusions
Recently it has been hypothesized (Langton et al. Respiratory Research, 2017) that there may be procedural differences between bronchoscopists in the application of radiofrequency during BT, and discrepancy in the number of activations may significantly influence the clinical response of patients: a large number of activations correlates with a good clinical response. Our data support this belief and also suggest that the presence of a specific patients phenotype (overweight/obese women with poor comorbidity and not old) can predict a significant response to treatment.

(93) Submission ID#458106

Is USG Morphological Features on EBUS TBNA useful for predicting malignancy ?

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Umang Shah – Pranayam Lung and Heart Institute, Vadodara, Gujarat

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

USG morphological features have shown to predict malignancy on TBNA aspirates by EBUS TBNA primarily in diagnosis and staging of lung malignancies mainly in western population. The purpose of our study was to

investigate and assess the utility of USG morphology of lymph nodes in predicting malignant cytology by EBUS TBNA in TB Endemic Country.

Methods
EBUS was performed for evaluation of isolated mediastinal lymphadenopathy irrespective of the underlying disease in 100 consecutive patients. All Seven Ultrasonographic morphological features were recorded prospectively in real time and later correlated with final histopathological diagnosis.

Results
A total of 100 consecutive patients undergoing EBUS were studied. Of the total 223 lymph nodes evaluated, malignant cells identified in 59 (26.45%) nodes, granulomas identified in 66 (29.59%) nodes and non-specific features were identified in 98 (43.94%) nodes. On univariate analysis size >15 mm on short axis and 21 mm on the long axis, presence of coagulation necrosis sign with central intra-nodal vessels obliterated with invasion of malignant cells and indistinct margins were predictive of a malignant etiology. Our results are in variance with the earlier mentioned studies as we found that lymph node size > 21 mm in long axis, central intra-nodal vessels and indistinct margins were more predictive of malignancy. In the final multivariate model, predictive probability of 0.511 (96% CI 0.539-0.579) for malignancy was found if size was > 21 mm in long axis with indistinct margins.

Conclusions
It appears that so called strongly predictive signs for malignancy become less reliable when studying a heterogeneous population in TB endemic country.In concordance with previous studies our results shows; that ultrasound criteria are mainly useful due to their negative predictive value. The implications is if an lymph node had a size of more than 21 mm in long axis, presence of coagulation necrosis sign with central intra-nodal vessels and indistinct margins then this lymph node is most probably malignant. In endemic areas like Indian subcontinent where infection due to chronic inflammatory conditions such as Tuberculosis and Sarcoidosis are more common; Radiological appearance compared to previous CAT scans and CXR appears to be deteriorated in size and shape which should be biopsied for further diagnostic evaluation.

(94) Submission ID#477137

Lipoid pneumonia due to occult GERD: A case diagnosed with transbronchial cryobiopsy

Submission Type: Case Report

Submission Status: Complete

Submitter: Xi Zhan – Department of Respiratory and Critical Care Medicine, Beijing Chaoyang Hospital

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Interventional Pulmonology

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Background
Lipoid Pneumonia is difficult to diagnose if the aspiration is occult, especially if the CT imaging is non-specific.

Case Report
A 38-years old mail patient was admitted in our department with a chief complain of Progressive cough for 6 months, SOB for 1month, Productive, with small amount of white mucous, no hemoptysis, no fever, no chest tightness, no chest pain. No joint pain ,no dry mouth, no heart burn or hiccup. He was prescribed some amoxicillin by the local clinic and no improvement. The cough became severe, and 1 month ago the patient stared to feel short of breath. The Ct scan showed a diffused reticular pattern (fig 1), mainly at the right lower lobe. No history of hepatitis or tuberculosisno history of surgery, trauma or blood transfusion. Smoking history: 20.pack.year. No history of bird keeping or humidifier using. No family history of illness. Physical Examination: T36.5P 80bpmBP 120/80mmHg,HEENT: Normal, rough breath sound and crackles could be heard at the base. Normal abdomen and limbs. Lab test: ABGroom airPH 7.41PCO2 44mmHgPO2 86mmHgESR 3mm/hCRP 0.12 mg/dl RF <11.00 IU/mL ASO 55.30 IU/mL; IgG 1120.00 mg/dlIgA 357.00 mg/dlIgM 63.10 mg/dl ANA (-)auto-immune antibody series (-)ANCA (-),Lung function: FVC 3.75L78.4%pred FEV1/FVC 82.52%DLCO SB 67.3%; FENO16ppb Cardio-ultrasoundnormal. Normal and smooth mucosa was detected under bronchoscopy. BALMacrophage 59.0%Lymphocytes10.0%Neutrophil 26.0%Eosinophil % 5.0%CD4+/CD8+0.8. And a transbronchial cryobiopsy was performed of the right lower lobe for biopsy, and the pathology showed granulomatous, form cells, crystallized cholesterol(fig 2),and the Sudanese red stain was applied on the lung tissue, which was positive(fig 3). Since the patient denied a history of heart burn or hiccup, a PH and motility monitor was applied to him, Low pressure of the lower esophagus, esophageal transmission dysfunction, Demesster score:18.9pathological acid reflux, Total reflux 5519 were acid reflux36 were non acid reflux. A diagnosis of lipoid pneumonia and occult GERD was made, PPI and Mosapride were prescribed, and 8 weeks later, his cough relived. He is still on follow up.

Conclusion
Transbronchial Cryobiopsy is useful for diagnosing a diffused pattern of pneumonitis.

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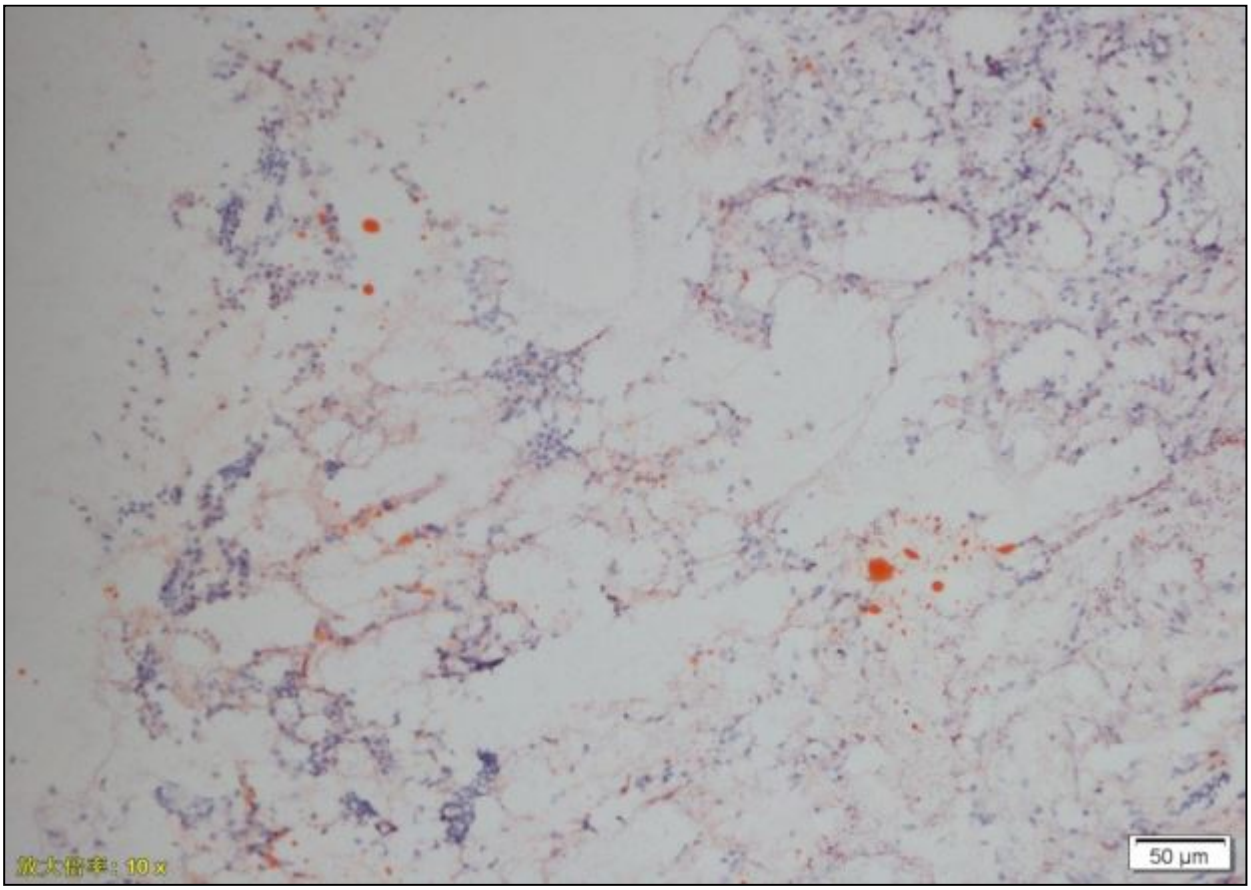
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(95) Submission ID#477787

Long-term follow-up after bronchoscopic lung volume reduction with one way valves in patients with heterogeneous emphysema.

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Ming Li – Shanghai 10th People's Hospital, TongJi University

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Interventional Pulmonology

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Background
A lot of studies concluded that bronchoscopic lung volume reduction (BLVR) with implant of one-way valves (EBV or IBV) is a feasible treatment for heterogeneous emphysema in the early follow-up. We aimed to evaluate the long-term effects and safety of this procedure in heterogeneous emphysema patients.

Methods
It was a retrospective single center study including all consecutive patients with heterogeneous emphysema undergoing one-way valves treatment and completing at least 2 years of long-term follow-up. The difference of lung function data and SGRQ before and after the procedure was calculated. Complications were also recorded to show the safety of the treatment. To evaluate the survival benefit of BLVR with valves in these patients, we used propensity scores to match them to 30 COPD patients taking into account age, sex, FEV1%, MRC score, AE frequency and BMI.

Results
Ten patients undergoing unilateral BLVR entered our study. Pre-operative mean FEV1 was 0.97 L/S (28%), TLC was 7.88 L (132%), RV was 5.7 L (221%), and the 6MWT was 301 m. The MRC score was 3.5. We evaluated the presence of collateral ventilation by HRCT or Chartis system (EBV). All of the patients had visible and complete interlobar fissures. No patients died during follow-up. FEV1, RV, 6MWT and MRC score showed a significant improvement ($p < 0.01$). Atelectasis was found in 3 patients. And the improvement of FEV1 and 6WMT in these patients was more significant than those without atelectasis. No death related to the procedure was observed. Pneumothorax was found in 2 patients. The 3-year survival rates were 100%. While the 3-year survival rate of matched-patients was 70%.

Conclusions
BLVR is a feasible and safe treatment for heterogeneous emphysema patients. Long-term sustained improvements can be achieved. Patients with atelectasis may have a greater benefit. Patients received BLVR may have a better prognosis.

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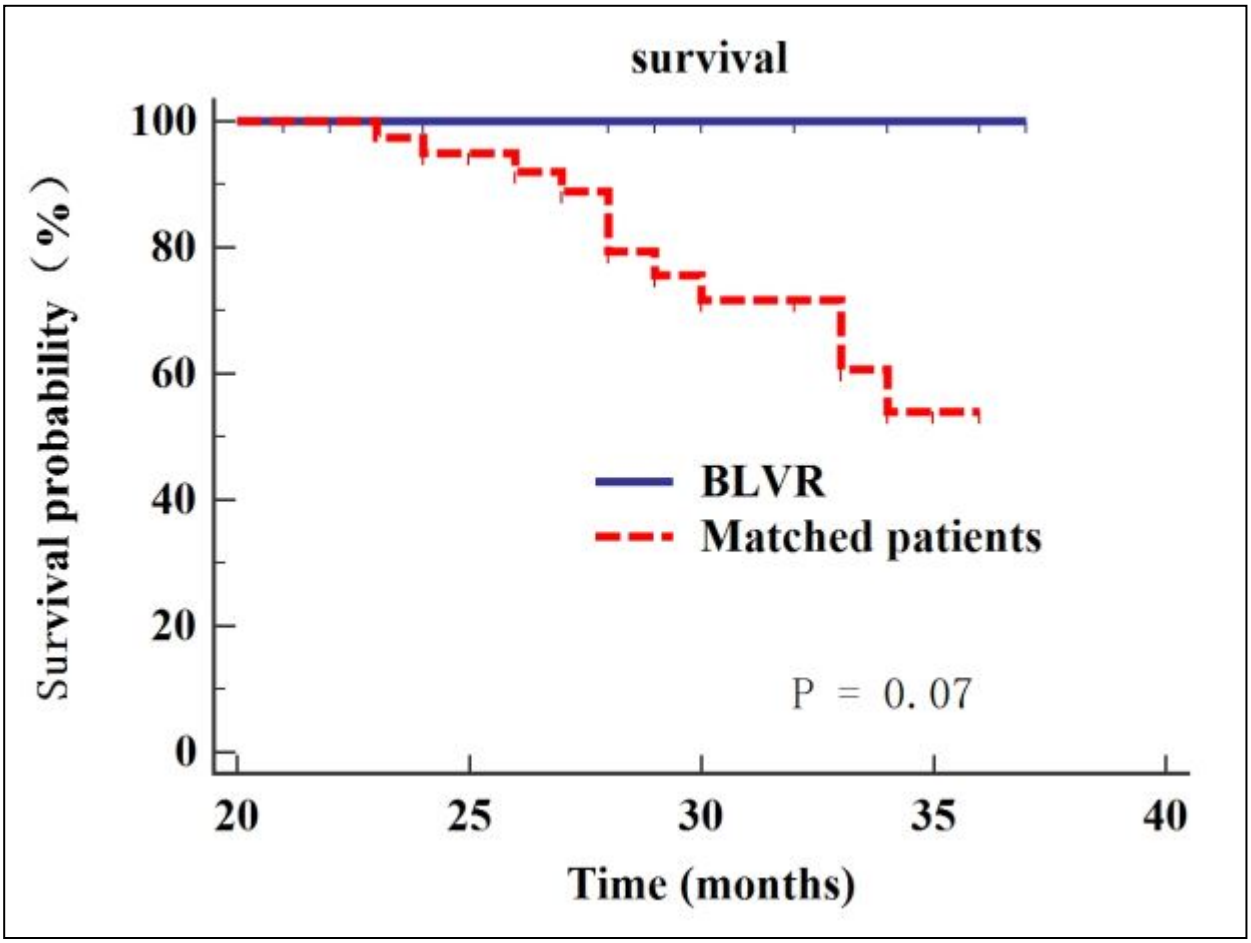
survival
Survival probability（%）
100
80
60
40
20
0
20
25
30
35
40
Time (months)
BLVR
Matched patients
P = 0. 07

(96) Submission ID#459151

Making diagnosis of Potts disease through endobronchial ultrasound guided needle aspiration of lytic paraspinal lesion: A case report.

Submission Type: Case Report
Submission Status: Complete
Submitter: Hanine Inaty – Cleveland Clinic

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Incidence of extra pulmonary tuberculosis is high in endemic countries, with 10% of these cases have skeletal involvement. Spinal tuberculosis is called Potts disease and account for half of skeletal tuberculosis. The diagnosis is most commonly made though CT guided biopsy of the lytic bone lesions. Here we present a rare case of Potts disease diagnosed through endobronchial ultrasound guided needle aspiration after failing CT-guided core biopsy.

Case Report
Our patient is a 26 year old male, recently immigrated to the United States from India, presented to the

hospital with acute hip pain, weight loss and night sweats. He denied any pulmonary symptoms at that time. Computed tomography of chest abdomen and pelvis revealed multiple destructive bony lesions involving T3-T5 vertebrae with prominent soft tissue component extending into the paravertebral space anteriorly and abutting the posterior aspect of the trachea (fig1A). Multiple additional scattered bony lesions were seen at the ribs, lumbar vertebrae and pelvic bones. Bone scan revealed active uptake at the corresponding sites. Differential diagnosis included extra pulmonary tuberculosis vs metastatic malignant disease. CT-guided core biopsy of a lytic lesion at the level of iliac bone was performed showing necrotizing granulomas with negative acid fast bacilli (AFB) stain and no malignant cells identified. He was referred to us for a diagnostic bronchoscopy. Airway examination was normal. A paraspinal lesion with central necrosis and evidence of bony invasion of vertebral bodies was identified on endobronchial ultrasound (EBUS) at the level of the upper trachea posteriorly. EBUS-guided transbronchial needle aspiration of the mass was performed (Fig 1 B1-2). Purulent secretions were drained with vacuum syringe attached to EBUS-scope (fig1C). AFB stain and culture of both the purulent drainage and the needle aspirate revealed mycobacterium tuberculosis confirming the diagnosis of Potts disease.

Conclusion

Although extra pulmonary tuberculosis is extremely rare in western countries, it should be highly suspected in patients originating from endemic areas who present with diffuse lytic bony lesions. We present a very rare case where EBUS was a valuable tool when CT guided biopsy failed to provide a diagnosis. A potential explanation is that EBUS- allowed for direct visualization and targeting of the bulk of the lesion where most of the active disease can be found.

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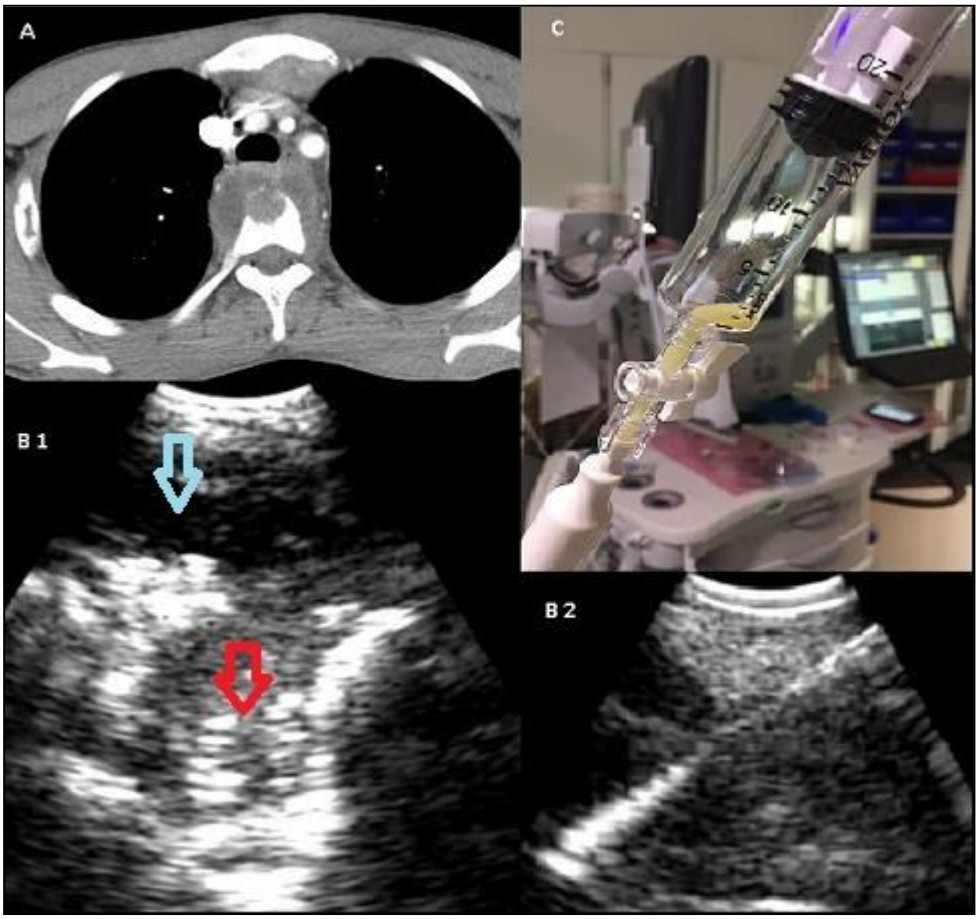
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(97) Submission ID#458560

Management of early airway restenosis after the placement of metal covered stent: a case report

Submission Type: Case Report

Submission Status: Complete

Submitter: Cen Chen – Department of Respiratory and Critical Care Medicine, Xiangya Hospital, Central South University

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Interventional Pulmonology

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Background

The formation of granulomas and scarring are common complications after endotracheal intubation, which causes airway stenosis and dyspnea. So far, bronchoscopic interventional therapy has become the mainstream when dealing with benign airway stenosis. Airway stenting, including metal stents and silicone stents, has been well recognized to be effective on relieving airway stenosis, especially for those who do not respond well to cryotherapy and electrocuting. Long-term placement of metal stents is usually complicated with airway stenosis, whereas early complications have been rarely reported. Therefore, unlike silicon stents,

metal stents are temporarily placed in airway for only 2 weeks to 3 months. Herein, we reported a rare case of early tracheal restenosis within 2 weeks after the placement of metal covered stents.

Case Report

A 51-year-old male patient with severe dyspnea for 10 days was admitted to our department on January 1st, 2017. He received endotracheal intubation 2 weeks ago. Bronchoscopic examination showed airway stenosis caused by the proliferation of granulation tissue and scars formation in the middle and upper segment of trachea. Cryosurgery and balloon dilatation were subsequently performed but did not work well. Therefore, a metal covered stent (18mm*50mm) was placed on January 6th, after which his symptom of dyspnea was relieved. Bronchoscopy on January 9th showed slight proliferation of granulation tissue, so cryotherapy was then given. But subsequent bronchoscopy revealed that granulation tissue and scars were increasing, and severe airway stenosis formed. The patient also felt that dyspnea gradually aggravated (dyspnea score: grade IV). Based on these observations, metal stent was removed. Cryotherapy, high frequency electrocuting and balloon dilatation were performed for multiple times under bronchoscope. On March 15th, a silicon stent was placed under rigid bronchoscopy. His symptom of dyspnea got greatly relieved (dyspnea score: grade II)and subsequent regular brochoscopic examinations only showed slight proliferation of granulation tissue. After 9 months, the silicon stent was removed, and airway stenosis was not seen. The patient has been followed up so far, and no dyspnea is reported.

Conclusion

Tracheal restenosis within 2 weeks after the placement of metal stents is rarely seen. Investigations focusing on its prevalence are needed to determine whether metal stents should be routinely used in post-intubation airway stenosis. Comprehensive managements are required once restenosis occurs, including the removal of metal stent, endoscopic therapies (cryosurgery and balloon dilatation) and the placement of silicon stent.

(98) Submission ID#478019

Management of endobronchial malignancies by photodynamic therapy

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Tatsiuya Inoue – Department of Thoracic Surgery Nippon Medical School

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Photodynamic therapy (PDT) is widespread acceptance as a therapy for endobronchial malignancies(EM). The adaptation in Japan for PDT is the central type early lung cancer(CELC) and other things (the malignancies more peripheral than the trachea) with a bronchoscope in the visible range.

Methods
PDT using NPe6 was performed for EM at Nippon Medical School Hospital from January 1, 2013 to December 31, 2017. Among these patients, we analyzed EM, and we propose a treatment strategy for patients with EM.

Results
PDT was performed 13 patients of 50 lesions with EM. The ratio of men to women was 12 to 1. The mean smoking index was 1267.9 of the 75.6-year-old average age. And the average of the operative time was 38 minutes. The location of tumors are right B1;3, right B8;1, left main bronchus;1, left B1+2;4, left B3;1, left B4;1, left B6;1, left B9;1. The cases that Complete Response(CR) provided by PDT for CELC were 6 cases, and the irradiation from once to three times was necessary. The volume of lesion more than 10mm in surface diameter and had difficulty in laser irradiation angularly retreatment was necessary. By irradiating it more than four times in the case of Stable Disease(SD), PDT functioned as maintenance therapy.

Conclusions
PDT can treat Patients with EM who are not fit for thoracotomy such as respiratory failure due to after thoracotomy or chronic obstructive pulmonary disease. And patients can have other cancer treatment along with PDT. It is safer than conventional high output laser cautery and electrical tumor cautery, with a little bleeding and a low aggression, and in future adaptive expansion is prospective treatment.

(99) Submission ID#459611

Management of tracheobronchial rhinosporidiosis - largest case series till date

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Vallandramam Pattabhi Raman – Royal Care Super Speciality Hospital

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Background
Rhinosporidiosis is a chronic granulomatous infection caused by Rhinosporidium seeberi. Nasal, nasopharyngeal involvement is most common followed by ocular disease as has been reported in large series from India and Sri Lanka. Tracheobronchial rhinosporidiosis (TR) is a rare disease with 11 cases reported till date (table 1)

Methods
We performed a retrospective analysis of medical records of all patients who were managed bronchoscopically for TR at our center.

Results
5 patients had presented with TR; all were male with mean age of 49.6 years. All patients presented with stridor, all had history of nasal rhinosporidiosis and 3 patients (60%) had concomitant nasal disease. Lesions were single and polypoidal in 2 patients (40%) and multiple and polypoidal in the rest. Lesions were tracheal in 3 patients (60%), bilateral bronchial in one (20%) and tracheobronchial in one patient (20%). All patients were managed with rigid bronchoscopy, electrocautery snare and argon plasma coagulation to the base. Procedure was well tolerated and all patients had immediate relief of symptoms. Patients were followed up with surveillance bronchoscopy and after a mean follow up of 46 months none of the patients had recurrence of lesions.

Conclusions
Large case series experience of unusual manifestation of a rare endemic infection. Bronchoscopic resection seems to be the most effective way to manage these patients with good long-term outcomes.

Uploaded File(s)

Image or Table

Author, year	Age, sex	Previous surgeries	Presentation	Co-existent disease	Position in respiratory tree	Management	Follow up & dapsone use
Thomas et al. 1956	31, male	3, last 1 year ago	Cough, mucoid expectoration for 1 year	Nasal, nasopharyngeal and ocular	Right intermediate lobe opening	Middle and lower lobectomy, no bleed	No recurrence at two years, Dapsone use NA
Grewal et al. 1959	55, male	Nil	Dyspnea– 6 months, Stridor – 1 day	Nasopharyngeal	Mid and lower tracheal	Failed tracheostomy, tracheotomy and removal	NA
Subramanian et al. 1960	30, male	Single surgery 4 years back	Dyspnea, stridor for 1 day	Nasal, nasopharyngeal	Mid tracheal and right main bronchus	Died before diagnosis due to asphyxiation	NA
Shah AK et al. 1985	50, male	5, last 6 months back	Dyspnea, stridor to emergency	Nil	Mid and lower tracheal	tracheotomy and removal	Recurrence at 3 months, died at 6 months
Rajeev et al. 2000	35, male	Nil	Dyspnea, stridor to emergency	Nil	Upper tracheal	Tracheostomy, biopsy and endoscopic removal, no bleed	Dapsone given, no recurrence at 7 months
Rekha et al. 2006	48, male	3	Dyspnea, stridor for 4 months	Nil	Lower tracheal	Wide tracheostomy and rigid bronchoscopy	NA
Arora et al. 2008	73, male	7	Dyspnea, stridor to emergency	Nil	Mid, lower tracheal	Mass on tracheostomy, removal under GA	No recurrence at 6 months
Madana et al. 2010	32, Male	3, last 18 months back	Hoarseness of voice for 1 year	Nasal, nasopharyngeal and laryngeal	Upper tracheal, sub-glottic	Rigid bronchoscopy and laser excision	Dapsone given, follow up NA
Hansa banjara et al. 2012	35,male	Single surgery three years back	During pre-op for nasal disease	Nasal, nasopharyngeal and urethral	Distal left main bronchus	Flexible bronchoscopic excision	Not on dapsone, no recurrence at 1 year
Singh RK et al. 2013	42, male	Nasal surgery 10 years back	Stridor	Nasal, cutaneous	Proximal right main bronchus	Flexible bronchoscopic excision	Dapsone 100mg/day for 2 years
Saha KL et al. 2014	35, male	nil	stridor	nil	Sub -glottic	Open excision	No recurrence at 30 months

(100) Submission ID#471410

Massive hemoptysis in children due to intralobar pulmonary sequestration

Submission Type: Case Report

Submission Status: Complete

Submitter: Tina Reisa – University of Indonesia

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Role: Presenting Author

Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

- Yes

Background
Hemoptysis is rare but potentially life threatening in children. Massive hemoptysis is defined as blood loss more than 200 ml per day. Acute lower respiratory infection and foreign body aspiration are the most common cause of hemoptysis in children. Pulmonary sequestration (PS) is a rare congenital bronchopulmonary malformation accounting for 0.15% 6.4% of all congenital pulmonary malformations. Pulmonary sequestration can be classified into intralobar sequestration (ILS) and extralobar sequestration (ELS) according to the absence or pres¬ence of independent visceral pleura encase in abnormal lung tissues. Its receives blood supply from systemic circulation arteries (main¬ly thoracic aorta and aorta abdomina¬lis). Intralobar sequestration is the most common type (75-85%). Its pathogenesis was formed by the growth of the primitive foregut ventral side lung bud during the embryonic development. Main manifestations of PS are recurrent respiratory tract infection. Hemoptysis is not a common symptom in PS. We presented a case of ILS with chief complaint as massive hemoptysis.

Case Report
Eight years old male child came to emergency department with massive hemoptysis (>400ml in 24 hours), with chest X-ray showing an opacity in the right lower lobe. This patient has a history of hemoptysis 10 months before and treated with antituberculosis drug but no improvement. We performed a flexible bronchoscopy to identify the source of bleeding. We found an active bleeding from the right lower lobe. We also found a multiloculated infiltration mass like polyp in right lower lobe and left lower lobe. CT angiography was done which demostrated an intralobar pulmonary sequestration in the right and left lower lobes that provide arterial blood supply from thoracic aorta, vertebra artery and pulmonary artery.

Conclusion
We demonstrated a case of the lung sequestration in male children. Massive hemoptysis is not common symptom in pulmonary sequestration. Congenital pulmonary sequestration is a rare lung malformation. In cases of recurrent pulmonary infections of identical localization or recurrent hemoptysis, lung sequestration should be considered in children so that a diagnosis by imaging methods can be confirmed rapidly. The fact that using flexible bronchoscopy can find the source of bleeding and the abnormality of the airway.

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Image or Table

(101) Submission ID#471282

Mature Mediastinal Teratoma: From Cough to Catastrophic Intrapulmonary Erosion

Submission Type: Case Report

Submission Status: Complete

Submitter: Sameer Avasarala – Respiratory Institute, Cleveland Clinic

---

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Mediastinal germ cell tumors can be broadly classified as benign (mature teratoma) or malignant germ cell tumors. Mature teratomas account for 3-12% of mediastinal tumors. By definition, they contain at least two of the three embryonic cell layers (ectoderm, mesoderm, and endoderm). It is not uncommon for these tumors to be detected incidentally on chest imaging. A quarter of tumors have radiographically evident calcification. Typically, they are asymptomatic and tend to grow slowly. However, courses can be complicated by erosion into adjacent structures.

Case Report
A 52-year-old woman was found to have a right upper lobe mass on plain chest radiography that was obtained to assess a subacute non-productive cough. She later manifested with dyspnea, a productive cough, fever, and pleuritic chest pain. Through the combination of chest radiography, bronchoscopy, and thoracic surgery, she was found to have a very large (7.8 cm anterior-posterior x 5.7 cm width x 3.8 cm height) thymic mature cystic teratoma that eroded into the pulmonary parenchyma (Figure 1). In modern medical literature, this is the largest mediastinal teratoma complicated by intrapulmonary erosion. On outpatient follow up 14 weeks post resection, there was no evidence of recurrence.

Conclusion
Sixty percent of patients with mediastinal teratomas have no symptoms at the initial time of diagnosis. Cough, dyspnea, chest pain, or a clinical picture of pneumonia can be present due to compression or obstruction of surrounding structures. Erosion into surrounding viscera is rare and can occur spontaneously. It can occur into the adjacent lung, tracheobronchial tree, pleural space, or the pericardium. Clinical manifestations vary: respiratory failure (major airway or pleural space), hemoptysis (pulmonary vasculature), shock (pericardial sac). Autolysis, infection, inflammation, and ischemia are all proposed theories behind erosion.
Surgical resection is the preferred treatment modality due to the risk of malignant transformation and erosion. If erosion occurs, patients will require parenchymal resection. Our patients therapy consisted of surgical resection of the teratoma proper, right upper lobe, and right middle lobe. The right middle lobe was resected due to involvement of vessels close to the hilum; the pulmonary component of the mass was not amenable to wedge resection. She had no evidence of recurrence on follow up.

In summary this case reports describes a rare complication of an entity that is encountered by pulmonologists, interventional pulmonologists, and thoracic surgeons. It is the largest mediastinal teratoma complicated by intrapulmonary erosion to be reported in medical literature.

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(102) Submission ID#459141

Measurement of Rigid Bronchoscopy Intubation Forces

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Rigid bronchoscopy is the gold standard for acute management of central airway obstruction. This skill is often taught in the apprenticeship format, with intubation practiced on artificial manikins, animal models, and patients. Adverse events of rigid bronchoscopy intubation include damage to teeth, gums, vocal cords and trachea, as significant (but not well known) forces are applied to these tissues. We aimed to develop a device that would directly measure the forces and torques applied to the rigid bronchoscope during intubation by interventional pulmonologists.

Methods
We have prototyped a force sensing device to measure the force and torque applied by the hand of the bronchoscopist during rigid bronchoscopy intubation. A 6-axis force sensor (ATI-Industrial Nano17), secured to a 3D-printed adapter, were mounted to the universal instrumentation barrel of the rigid bronchoscope (Bryan-Dumon, Lymol Woburn, MA). Intubation forces and torques were measured both on a low-fidelity manikin without bronchoscope lubrication, with bronchoscope lubrication, and in patients, and correlated with the position of the bronchoscope.

Results
Intubation forces were measured in a low-fidelity manikin intubation with four bronchoscopists (2 IP fellow, 2 attending), and in two patients. Peak intubation force and torque in the patients were 35 N and 1 N-m, respectively. Intubation performed on the manikin with and without lubrication resulted in slightly higher forces, but the sample size was too small for statistical analysis.

Conclusions
Rigid bronchoscopy intubation results in significant forces applied to the bronchoscope, and consequently to the patient. Care must be taken to avoid tooth and soft tissue damage during intubation. Force measurement data can be used to develop a realistic simulation model in future training sessions.

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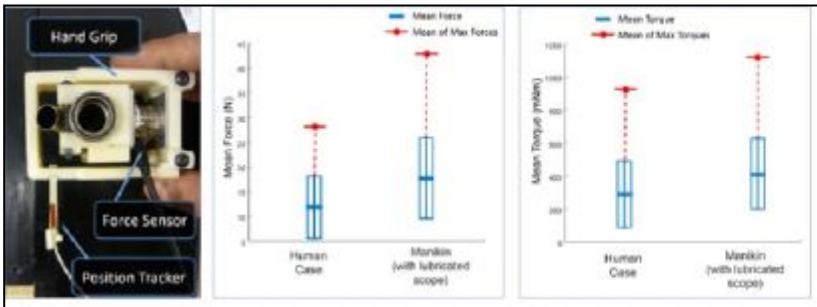

(a) (b) (c)

Figure 1. Force measurement device (a) mounted on universal instrumentation barrel. Mean and max values for the intubation force(b) and torque (c) on patient and manikin. Force was measured in Newtons (N) and torque in Millinewton-meters (mNm).

(103) Submission ID#456310

Medical thoracoscopic findings and diagnostic yield according to pleural nodularity on CT scan in patients with suspected malignant pleural effusion

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Wooho Ban – Division of Pulmonary, Critical Care and Sleep Medicine, The Catholic University of Korea

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Medical thoracoscopy (MT) has emerged as a minimally invasive technique for exploration of pleural space with conscious sedation and local anesthesia. Especially, the evidence of using medical thoracoscopy in patients with suspected malignant pleural effusion (MPE) has grown rapidly. Pleural nodules on computed tomography (CT) strongly suggest MPE. However, the association between the presence of pleural nodules on CT and MT findings in patients with suspicious MPE has not been studied well. This study aimed to

analyze the characteristics of MT findings and diagnostic yield according to the presence of pleural nodularity on CT scan in patients with suspected MPE.

Methods
From May 2015 to September 2017, a retrospective study was conducted in Incheon St. Marys hospital, The Catholic University of Korea. Patients who underwent MT suspecting MPE were classified into two groups according to pleural nodularity on CT scan. Clinical parameters including pleural fluid analysis and imaging findings on CT and MT were reviewed and diagnostic yield were analyzed between two groups.

Results
Among 47 patients, pleural nodules on CT scan were detected in 26 (55.3%) cases. CT findings about pleura and parenchymal lesions were not significantly different between two groups. Pleural nodule or mass on MT were more frequently observed in the pleural nodule on CT positive group (84.6% vs. 52.4%, p = 0.025) and the diagnostic accuracy was higher compared to the nodule negative group (92.3% vs. 66.7%, p = 0.008). However, pleural nodules on MT were detected in more than half cases in the nodule negative group. Interestingly, we were able to confirm diagnosis of 14 cases by MT in the nodule negative group.

Conclusions
MT is an useful method in suspected MPE, especially in patients with pleural nodules on CT scan. However, even in cases without pleural nodularity on conventional imaging, it could be an efficient method for improving proper diagnosis in patients with suspicious MPE.

(104) Submission ID#460101

Montgomery T stent and Dumon Y stent in the palliation of extensive distal airway obstruction and fistula

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Jorge Dionisio – Instituto Português de Oncologia Francisco Gentil de Lisboa

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Disclosure:

Disclosure Status: Complete

Disclosure: Does Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

Despite allowing airway permeability and palliation improvement, in cases of extensive and more distal obstructing lesions, anatomic airway complexity makes debulking and stenting technique more complex and hazardous and functionally less rewarding. We report our early experience with Montgomery T stent and Dumon Y stent for the palliation of distal airway obstructions and fistula.

Methods

From February 2003 to February 2018, 35 patients with 36 distal airway obstruction or fistula for whom, only

minor endoscopic palliation was possible, received either a Montgomery stent or a Dumon Y stent. Twenty six had primary carcinoma of the lung, 5 had oesophageal carcinoma, 2 had metastatic carcinoma and 3 patients had anastomotic obstructions after lung transplant.
In 31 cases the lesions were in main stem bronchus, 18 on the right side and 13 on the left side, and in 22 the lesion also extended to adjacent lobar bronchus. In 2 cases terminal trachea was also involved, in 2 cases involvement of bronchus intermedius and in another case upper lobar bronchus was involved.
In 15 cases there was a complete bronchial obstruction, in 14 a high grade obstruction, in 5 moderate obstruction and bronchial fistula in 2 cases.
Mechanical debulking combining rigid bronchoscope in 18, rigid forceps in 11 and balloon dilatation in 12 was performed. Laser photocoagulation was used in 12, electrocautery in 9 and stenting alone in 2.

Results
Complete bronchial permeability was achieved in 20 cases, partial permeability in 8 and poor permeability in 6 cases. The 2 fistulas were completely sealed. In the 35 patients included in the study, 36 stents were used including 19 Montgomery-T stents and 17 Dumon-Y stents. In 5 of these cases the stent was removed due to poor insertion and adaptation. Lung atelectasis resolved in 7 of the 11 cases and in all the 8 cases of lobar atelectasis. Stenting was an easy procedure in 18 cases, with some adaptation complexity in 12 and difficult in 6.

Conclusions
Biforcated Montgomery T stent and Dumon Y stent have the potential for palliation of distal airway obstructions and fistula. Stenting is generally a straightforward procedure and it might be a valuable therapeutic tool, allowing other therapeutic modalities.

(105) Submission ID#459413

Navigating through complex bronchoscopy procedures using RESP-iration algorithm

Submission Type: Poster Session ONLY

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

In recent years, Bronchoscopy Suite Nursing has evolved from the simple use of a rigid or flexible bronchoscope to more than 20 advanced diagnostic and pulmonary therapeutic interventions using more sophisticated equipment. Recent bronchoscopy techniques include using complementary devices such as cryotherapy units, ablation devices, stent delivery apparatus and other imaging devices such as ultrasound, CT Fluoroscopy and electromagnetic guidance. This poster aims to guide assisting nurses in navigating through the growing intricacy of Interventional Pulmonology which now requires complex knowledge and skills. A simple algorithm using an acronym is proposed to help nurses identify the essential information required in most procedures.

Methods
A review of accessible published literature was performed on February 2018. The search criteria were limited to articles published in the last 20 years featuring recommended practices in the theatre environment. The focus was restricted to two key concepts which are patient safety and procedural efficiency. Articles that dealt on the Anesthetic side of surgery were excluded.

Results
A total of 52 articles related to perioperative nursing and bronchoscopy were chosen through an electronic database search and known literature. The following areas of knowledge were deemed essential in preparing the Bronchoscopy Suite or Operating Theatre Room for a bronchoscopy procedure:
Reason [Indication + Contraindication]
Equipment [Equipment + Devices + Materials]
Sequence [Settings and Procedure]
Protect [Patient Safety and Staff Safety]

Conclusions
A simplified but comprehensive checklist or guide is required for nurses to adequately prepare the Bronchoscopy Suite or Operating Room ensuring the efficient use of time while maintaining patient safety throughout the procedure.

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Image or Table

Procedure: Linear EBUS [Endobronchial Ultrasound] + TBNA [Transbronchial Needle Aspiration]

1. REASON

Indication: Lung Cancer Diagnosis and Staging. Lymphoma Diagnosis and Staging, Infection, Sarcoidosis, Submucosal and peribronchial tumours.

Contraindication: Life-threatening cardiac arrhythmias, Current or recent myocardial ischemia, Poorly controlled heart failure, Severe hypoxemia, Anti-coagulant therapy, Coagulopathy and elevated BUN and Creatinine.

2. EQUIPMENT

Equipment: Endoscopy Tower, EBUS Module, Microscope + Cytology Trolley

Devices: 19G, 21G and 22G EBUS-TBNA Needles

Materials: 2% Lignocaine, 1% Lignocaine, 0.9% NaCl Solution, Lubricating Gel, Sterile Gauze, EBUS scope attachments, Endoscope Cleaning Solution

3. SEQUENCE

Settings:

A. Endoscopy Stack Bronchoscopy Settings
B. EBUS Contrast and Gain Settings
C. EBUS Ultrasound Modes
D. Report Settings

Procedures:

A. Bronchoscope and EBUS Connection
B. Bronchoscope Airway Insertion
C. Measurement of Lymph Node
D. Lesion or Lymph Node Sampling
E. Specimen Preparation
F. Bronchoscope Cleaning

4. PROTECT

Staff Safety:

A. Infection Control: N95 Mask, Gown and Gloves
B. Sharps Handling: Sharps Bin, Sharps Awareness Communication

Patient Safety:

A. Management of Sterile Environment
B. Management of Bleeding: Cold Saline, Adrenaline 1:10,000, Balloon Tamponade, Endobronchial Blocker, Double Lumen Tube, Argon Plasma Coagulation
C. Management of Pneumothorax: Chest X-ray, Chest Drain Insertion Setup
D. Post–Procedure Patient Education and Follow-up

(106) Submission ID#459592

Next-Generation Sequencing for Genotyping of Advanced Lung Cancer Specimens Obtained by Endobronchial Ultrasound-Guided Transbronchial Needle Aspiration

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Jiayuan Sun – Shanghai Chest Hospital, Shanghai Jiao Tong University

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Role: Co-Author

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive procedure, but it yields small volume samples. The study aims to investigate the performance of capture-based targeted sequencing on EBUS-TBNA samples.

Methods
EBUS-TBNA samples of advanced non-small cell lung cancer (NSCLC) were prospectively collected. All samples were formalin-fixed paraffin-embedded. Three representative mutations, EGFR, ALK and ROS1, were detected by amplification refractory mutation system polymerase chain reaction (ARMS-PCR), immunohistochemistry and quantitative reverse transcription PCR (RT-qPCR), respectively. Capture-based targeted sequencing was performed on the remaining tissues using a panel consisting of 56 genes.

Results
Seventy-seven patients diagnosed with advanced NSCLC successfully underwent both next-generation sequencing (NGS) and conventional testing. Forty-one mutations detected by conventional methods were also detected by NGS in the three representative genes. Using conventional method as a reference, NGS demonstrated 100% concordance with it. Four EGFR mutations detected by NGS were not detected by ARMS-PCR due to the lack of coverage by the commercial ARMS-PCR kit. Many patients harboring other classic driver mutations, including 6 KRAS mutations, 1 BRAF mutation, 1 RET fusion, 1 MET amplification concurrent with EGFR L858R, 1 KRAS amplification together with EGFR 19del and 1 ERBB2 amplification were detected by NGS. The mean number of passes per lymph node was 5.2 in samples successfully applied both NGS and conventional testing.

Conclusions
NGS exhibits an excellent performance on EBUS-TBNA samples and can reveal comprehensive genetic alterations of the tumor without increasing samples, which is significant in therapeutic decision-making of advanced lung cancer.

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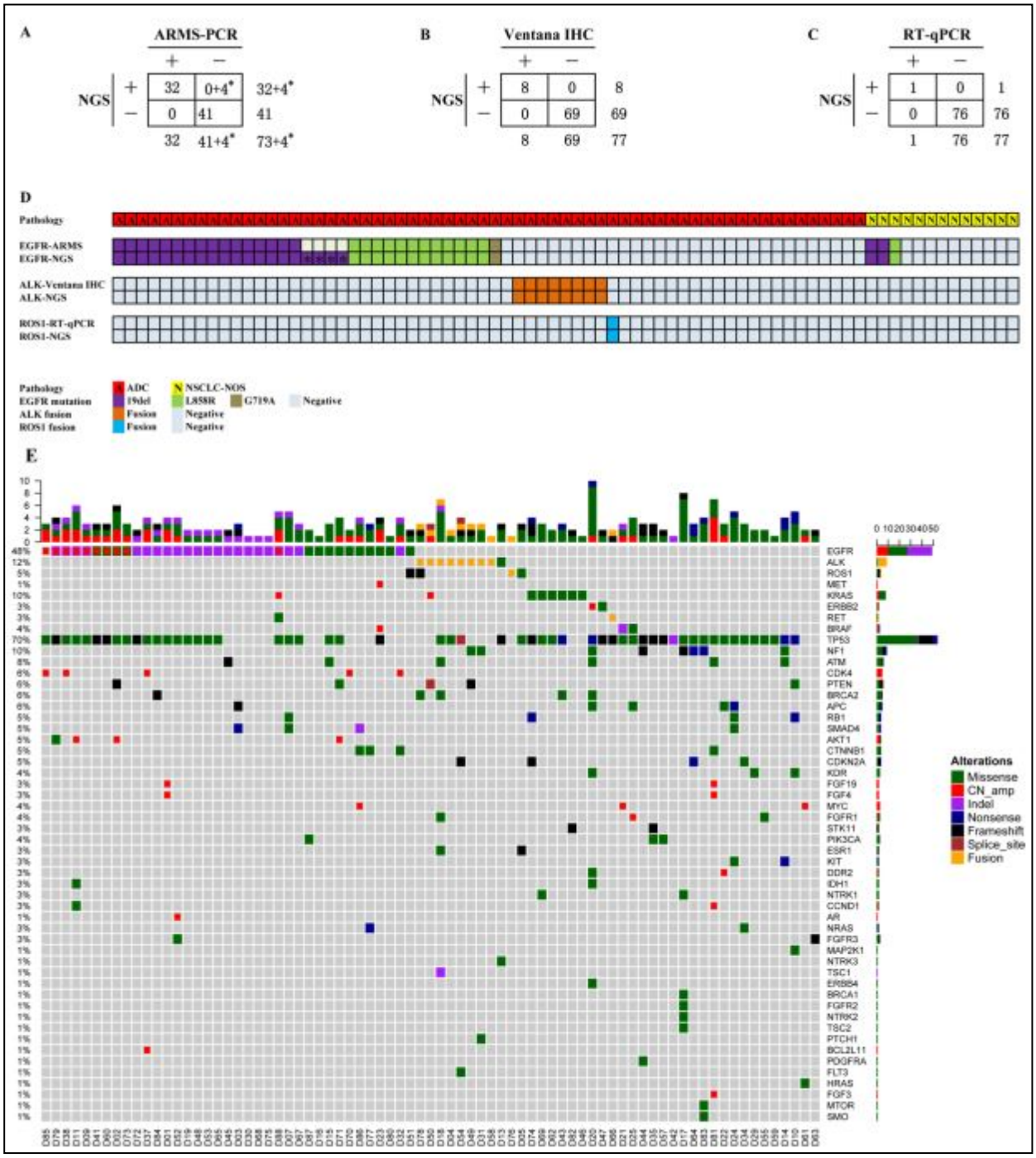
A
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+ −
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NGS − 0 69 69
8 69 77
C
RT-qPCR
+ −
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D
Pathology
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ROS1-NGS
Pathology A ADC N NSCLC-NOS
EGFR mutation 19del L858R G719A Negative
ALK fusion Fusion Negative
ROS1 fusion Fusion Negative
E
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TP53
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CDK4
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SMAD4
AKT1
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FGF19
FGF4
MYC
FGFR1
STK11
PIK3CA
ESR1
KIT
DDR2
IDH1
NTRK1
CCND1
AR
NRAS
FGFR3
MAP2K1
NTRK3
TSC1
ERBB4
BRCA1
FGFR2
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BCL2L11
PDGFRA
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FGF3
MTOR
SMO
Alterations
Missense
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Indel
Nonsense
Frameshift
Splice_site
Fusion

(107) Submission ID#459650

Non-rigid bronchoscopically, high frequency ventilation via catheter ---A novel approach for Montgomery T-tube placement

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Chang-Hao Zhong – National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Disease, First Affiliated Hospital of Guangzhou Medical University, Guangzhou, Guangdong, China

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Disclosure:
Disclosure Status: Complete
Disclosure: Nothing to Disclose
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Interventional Pulmonology

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- Yes

Background
Iatrogenic injury, such as the tracheotomy, post-intubation stenosis, is a leading cause which result in subglottic stenosis. Fortunately, Montgomery T-tube placement is one of the potential option. However, the placement of Montgomery T-tube is typically under rigid bronchoscopic on previous research , however, several reasons , such as a small opening of glottis, the occluded trachea ,make it inoperable to insert a rigid bronchoscope. Moreover, the rigid bronchoscopy is currently compromised by the technical difficulty and insufficiency for community hospital in China. In our study, we described a non-rigid bronchoscopic approach to deploy a Montgomery T-tube under high frequency ventilation, and discuss its safety and efficiency.

Methods

High frequency ventilation via an 8F ventilation catheter was performed under general anesthesia, and a bandage was previously placed from extratracheal portion to short laryngeal portion. Assisted by the flexible bronchoscope, the external fixation of a bandage was performed via short laryngeal portion of T-tube to the oral cavity, subsequently, the deployment of the stent was adjusted by the inside bandage after the successful placement of T-tube to lower trachea. Meanwhile, a 4-year retrospective analysis of 25 cases of the placement of T-tube was presented to analyze complication and therapeutic effect for subglottic stenosis .

Results

A total of 25 cases were treated with this approach in recent 4 year.(20 cases with tracheotomy, 5 case with post-intubation stenosis). All procedure is successfully performed, and none of them lost their ability of transnasal breathing or clear enunciation. In PHYS of the WHOQOL-BREF, two weeks after operation was better than preoperative preparation (32.77 vs 50.43, P=0.02). Several complications, including the subcutaneous emphysema (16%), the skin irritation (36%), were found in perioperative period with this approach. The complications , such as type sputum retention (52%) and type granulomas in the upper edge of T-tube (28%), occurred at two weeks follow up. Fortunately, neither granulomas in the lower edge of T-tube nor displacement was found. Two cases with granulomas in the upper edge of T-tube needed a bronchoscopy treatment. Whereas, a few of cases needed an optional treatment for subsequent complications including cryotherapy(16%), forceps granulation (16%) and drug injections (4%) .

Conclusions
The non-rigid bronchoscopic approach to place a Montgomery T-tube under the high frequency ventilation is a safe and available treatment for patients with subglottic stenosis. Even though the complication rate is uncommon, the following up and prompt management are necessary.

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(108) Submission ID#459403

Novel Use of Augmented Fluoroscopy using the LungVision System To Access Peripheral Pulmonary Nodules - A Feasibility Study

Submission Type: Oral and Poster
Submission Status: Complete
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- Yes

Background
Multiple modalities exist for the bronchoscopic access of peripheral pulmonary nodules (PPN); each vary in equipment, cost, and required skillset inherent to that modality. LungVision (BodyVision Medical Ltd, Israel) is

a new modality that enables augmented bronchoscopic navigation to PPNs. The system integrates information from pre-procedural CT imaging into augmented fluoroscopic images, presenting real-time visualization of the airways and localization of the nodule during transbronchial navigation and biopsy. During the LungVision procedure, anatomic and external landmarks are used to fuse multiplanar fluoroscopic images with CT modeling to create an augmented fluoroscopic overlay of the airways leading to the nodule, and an overlay of the nodule itself such that biopsy localization can be achieved. LungVision has potential advantages in that it uses readily available equipment that users have familiarity with. This feasibility study evaluates LungVisions performance during concurrent use of electromagnetic navigation bronchoscopy (ENB) in access and biopsy of PPNs.

Methods
Patients with PPNs in which biopsy was needed to determine further management plans were enrolled. All patients were intended to have an ENB (SuperDimension, Medtronic, USA) with concurrent LungVision augmented fluoroscopy. ROSE was used in all cases. After patients were anesthetized, LungVision registration using multiplanar fluoroscopy imaging was performed, producing augmented fluoroscopic imaging (see photo). ENB was then performed in usual fashion with simultaneous LungVision-enabled augmented fluoroscopy imaging. All procedures used peripheral EBUS (pEBUS) for localization verification. When ENB and LungVision imaging disagreed, the modality which attained pEBUS verication was used for biopsy localization; in situations where neither attained verification, LungVision localization was used first, and if ROSE was non-diagnostic, then ENB localization was used.

Results
34 patients with 36 peripheral nodules were enrolled into the study. LungVision was used for all nodules. In 4 patients ENB could not be performed and only LungVision was used for navigation. Average nodule size was 19.6mm (+/- 10.1mm); 25 (69%) were <20mm. 21 (58.3%) were i upper lobe nodules. Localization success (pEBUS confirmation and/or definitive biopsy) occurred in 31 (86%) of nodules. 27 (75%) nodules received a definitive diagnosis. Navigation agreement between ENB and LungVision occurred in 22 (68%); in cases of disagreement, definitive diagnosis occurred in 7 (70%), and all resulted by using LungVision imaging for localization.

Conclusions
In this feasibility study, LungVision showed acceptable navigational agreement with ENB, and in several cases of disagreement it enhanced localization and diagnostic yield. Further studies are warranted to further evaluate its performance as a primary navigation modality.

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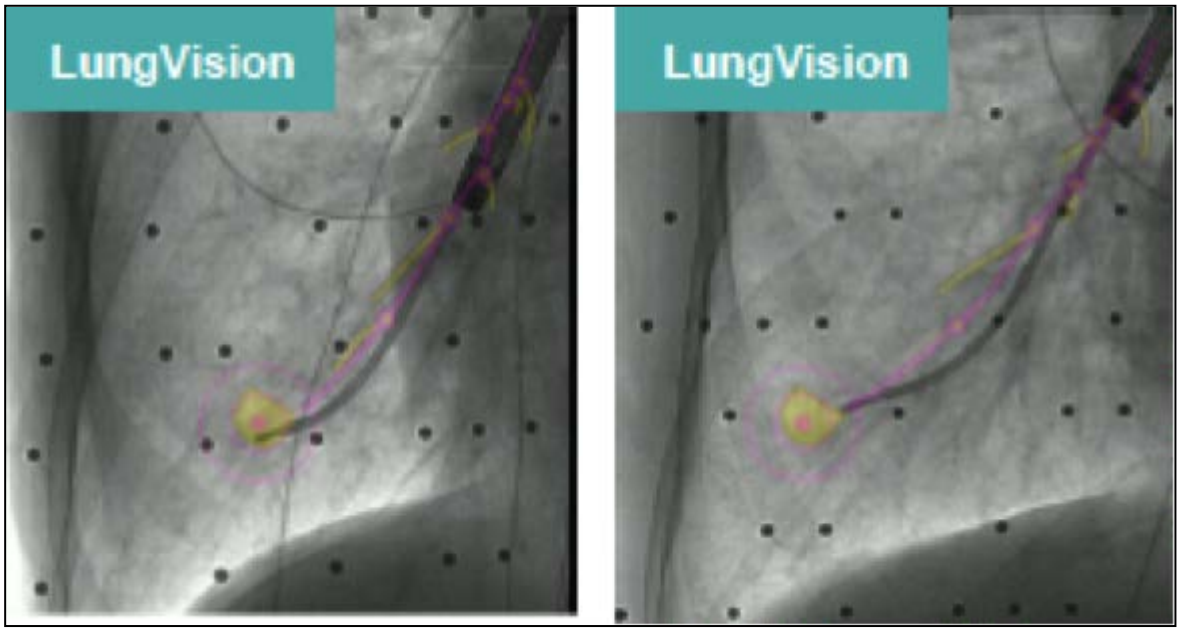
Image or Table


LungVision
LungVision

(109) Submission ID#459153

Observation of Different Types of Endobronchial Tuberculosis in Active Stage by Autofluorescence Bronchoscope

Submission Type: Oral and Poster
Submission Status: Complete
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Interventional Pulmonology

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- Yes

Background

Autofluorescence bronchoscopyAFB is mainly used to improve the diagnostic sensitivity for intraepithelial neoplasia and invasive lung cancer, howeverthere are other diseases that can also show the same red fluorescence as cancer by AFB, such as endobronchial tuberculosis. In China, endobronchial tuberculosis of active stage is divided into three categories including type Imucosa inflammation, IIulceration or necrosis, IIIgranulation, which has difficulty to distinguish from cancerespecially for type I and III. Over research focus in observing the performance of types I, II, III of endobronchial tuberculosis under AFB.

Methods

From Jan 2013 to Jan 2018, 185 patients67 men, 118 women median age 34.6 yearsrange from 17 to 80 years underwent AFP procedure after white light bronchoscopy (WLB), whose suspicious abnormal sites were all biopsied and pathologically diagnosed as tuberculosis. Statistics and analysis the ratio of different colors (green, brown or brownish-red) in different types of endobronchial tuberculosis under AFB.

Results

Patients of type IIIIII were 6347 and 75among them, the proportion of various fluorescence(green, brown or brownish-red) of type I was 31.7%, 12.7%, 55.6%, type II was 0%, 8.5%, 91.5%, type III was 0%, 21.3%, 78.7%. Type II showed the highest proportion of brownish-red fluorescence, type III followed and type I relatively low.

Conclusions

Most of endobronchial tuberculosis in active stage can display a brown or brownish-red fluorescence as same as malignant lesion, which means it is difficult to distinguish them only by WLB+AFBespecially in the country with a high incidence of tuberculosissuch as in China. So pathological diagnosis has become even more important, which could be more meaningful with acid-fast staining.

(110) Submission ID#476540

Obstructive Fibrinous Tracheal Pseudomembrane After Tracheal Intubation: Five Cases Report

Submission Type: Case Report

Submission Status: Complete

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Interventional Pulmonology

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Background
Obstructive fibrinous tracheal pseudomembrane (OFTP) is one of the uncommon potentially fatal complications of tracheal intubation. This cases report aims to increase the awareness of clinicians on this disease.

Case Report
Retrospectively collected patients from August 1, 2012 to November 2, 2017 in our hospital, who were suffered endotracheal intubated and then extubated. Five patients with OFTP were enrolled, one male and four females, always had aphenomenon about coma in surgery. Mean age was 50.0±23.2 years (range 15 to71 years); mean intubation period was 58.3±51.3 h (rang 15.5 to 144 h); mean time for developing symptoms after extubation was 47.2±42.8 h (rang 5 to 116 h). Symptoms of tracheal obstruction, including sudden severe dyspnea and stridor. Chest computed tomography (CT) scan performed an irregular luminal narrowing in the proximal trachea just below the vocal cords. Flexible bronchoscopy showed a thick, rubber-like, tubular, annular or striped pseudomembrane almost completely obstructing the upper and middle lumen of trachea below the vocal cords. The narrowing of the tracheal lumen were estimated approximately 4070% and the mean length of lesion was 1 to 3cm. Four OFTP were successfully removed by cryotherapy and biopsy forceps via flexible bronchoscope and one OFTP was removed by rigid bronchoscope. After that, the patients respiratory symptoms completely resolved. Histopathology of the pseudomembrane revealed fibrinoid degeneration, necrosis and inflammatory exudation, which can support the hypothesis that OFTP represents an early stage of ischemic tracheal wall injury. No bacteria were cultured from the bronchoalveolar lavage fluid about four patients. However, pseudomonas aeruginosa was cultured with only one person, and the reason was known yet. No recurrence was found thereafter via follow-up chest radiography, CT scan or flexible bronchoscopy.

Conclusion
Pulmonary physicians should pay attention to this rare and potentially life-threatening complication of endotracheal intubation. Early diagnosis and effective interventions for OFTP can make a wonderful outcome.

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Image or Table

Table 1. Clinical characteristics of 5 patients with OFTP

Case	Gender age(years)	Associated Illness	Reason for Intubation	Duration of Intubation	Delay from Extubation to First Symptoms	Presentation	Treatment	Outcome
1	F,15	no	postoperative(traumatic subarachnoid hemorrhage and subdural hematoma)	58h	48h	sudden severe dyspnea	cryotherapy via flexible bronchoscopy	recovery
2	M,39	long-term smoking history	postoperative(Intrahepatic bile duct stones after surgery)	144h	5h	acute stridor	cryotherapy via rigid bronchoscopy	recovery
3	F,57	hypertension, diabetes,right adrenal adenoma, asthma	postoperative(Right side of the stone)	22h	48h	acute stridor, sudden severe dyspnea	cryotherapy via flexible bronchoscopy	recovery
4	F,68	no	postoperative(Rheumatic heart disease)	52h	19h	acute stridor	cryotherapy via flexible bronchoscopy	recovery
5	F,71	hypertension, history of cholecystectomy, bile reflux gastritis	postoperative(Sliding esophageal hiatal hernia)	15.5h	116h	sudden severe dyspnea	cryotherapy via flexible bronchoscopy	recovery

(111) Submission ID#477814

One case of the treatment of COPD patients with bronchial subbasal stem cells transplantation

Submission Type: Case Report
Submission Status: Complete
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Background
Chronic obstructive pulmonary disease (COPD) is a common, chronic diseases in respiratory system, the global incidence over 40 years old has reached as high as 9% to 10% and the disability and mortality rate of it is high all over the world.Today the drugs treat for COPD can only delay the progress of the disease but have no effect for the recovery of pulmonary function. Hence, new therapeutics are necessary for COPD.

Case Report
Bronchial subbasal stem cells are a class of single potent stem cells having an SOX9 marker positive, which can proliferate and differentiate into new, functional lung tissue.The COPD patient's lung function was restored and reverse after the autologous transplantation of bronchial subbasal stem cell.In this case, the patient is 45 years old, smoking more than 20 years and was diagnosed as COPD for more than 7 years, during this period the LABA/ICS and LAMA was used to control the disease.He receive the bronchoscopy for

autologous transplantation with bronchial subbasal stem cell in our hospital on September 2017,the respiratory symptoms and pulmonary function of this patients was ameliorated 6 months later.The actual value / the expected value of FEV1 increase 6.8%, and the absolute value increase 260ml.

Conclusion

This technique provides a new direction for the treatment of various chronic lung diseases with progressive and irreversible damage of lung function. It also shows the possibility of stem cell transplantation in the treatment innovation of many other diseases.

(112) Submission ID#458885

On-site tracheobronchial silicone stent customisation aided by a 3D printed airway - the first case report

Submission Type: Case Report

Submission Status: Complete

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Background
Three dimensional (3-D) printing has an emerging role in bronchoscopic anatomy simulation for training and its clinical utility in creating personalised medical implants. In interventional pulmonology, this technology may aid the customisation of Y stents for patients, many of whom have complex airway anatomical considerations. Convention has been to combine computed tomography (CT) based measurements together with bronchoscopic measurements to help size, trim and cut fenestrations for branch airways with variable accuracy. Thus, our limited ability to customise stents increases an already high complication rate for these procedures, including obstruction and collapse of the right upper lobe. We detail a case where a 3-D printed airway aided in optimal placement of a fenestration in a silicone Y stent.

Case Report
A 63 year old woman was referred for chronic debilitating cough, wheeze and dyspnoea on a background of gastro-oesophageal reflux disease, obesity and obstructive sleep apnoea. Bronchoscopy confirmed severe tracheo-bronchomalacia with excessive dynamic airway collapse (EDAC) of the distal third of the trachea extending down both mainstem bronchi. Quality of life was severely affected with multiple hospital admissions for recurrent respiratory distress and chest infections. She was becoming increasingly dependent on CPAP for symptomatic relief.

Using thin slice contiguous images derived from a chest CT scan, a computer-based model of the proximal bronchial tree was generated and then a 3-D plastic cast of this area was printed including trachea, mainstem bronchi and lobar airways. This cast was used to measure and cut the final length of the limbs of the Y stent and create a fenestration to facilitate aeration of the right upper lobe immediately prior to insertion. The

patients limited cervical movement (recent cervical laminectomy), receeded jaw and small oropharyngeal dimensions meant accuracy was imperative as repeated procedures would have been technically difficult. Following insertion, bronchoscopic review of the stent confirmed optimal dimensions and matching of the right upper lobe orifice with the fenestration.

Conclusion

To our knowledge, this is the first case of a 3-D printed airway being used to guide stent dimensions and the placement of a fenestration in a silicone Y stent ,which is a practical and financially viable improvement in stent customisation. Although stenting for tracheo-bronchomalacia is not a destination therapy, the use of 3-D printed airway casts may aid procedural planning and allow tailoring of stents to individual patients, which may improve their tolerability. This technique could be transferable for customising airway stents for other indications.

(113) Submission ID#457792

Optimising the lung cancer diagnosis by EBUS-TBNA and ROSE in Romania

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Marioara Simon – Universitary Hospital ,,Leon Daniello" Cluj-Napoca

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Interventional Pulmonology

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Background
Endobronchial ultrasound guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive method for diagnosing and staging of lung cancer. EBUS-TBNA obtaines small specimens. Rapid on site examination (ROSE) is a rapid, real time examination method. The aim of our study is to evaluate the impact of ROSE on adequate specimen sampling, rapid results and high diagnostic rate.

Methods
We present the experience of the Bronchoscopy Department of the Pulmonology Clinic Cluj-Napoca with EBUS-TBNA as a tool for diagnostic of lung cancer. We evaluated the diagnostic capacity of ROSE for malignant tumors, by considering the histopathological examination as the diagnostic gold standard.

Results
In our retrospective and descriptive study we analyze the data of 332 EBUS-TBNA examinations with ROSE and histopathologic exam, performed for diagnostic purposes. From the total number of examinations 241 (72,59%) had mediastinal adenopathies or mediastinal and lung tumors of unknown origin. The age of the patients varied from 21 to 80 years, with an average age of 54.36 years. There were 160 male patients, representing 66.66% of the group. From the total of 186 cases of malignancy 142 cases (76,34 %) were identified as a primary lung tumor, 14 cases were identified as lymphoma (7,52 %) and 30 cases as malignant adenopathies of extra pulmonary origin (16,12%). The sensitivity of the ROSE is 85.71%.

Conclusions
By the introduction of this method EBUS-TBNA with ROSE in our country we can diagnose patients with lung and mediastinal tumors, which cannot be diagnosed by traditional bronchoscopy. This brings a valuable contribution to the improvement of lung cancer diagnostic in Romania.

(114) Submission ID#407871

Outcome of Advanced Lung Cancer with Malignant Central Airway Obstruction versus Malignant Pleural Effusion

Submission Type: Oral and Poster
Submission Status: Complete
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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Malignant pleural effusion (MPE) confers stage IV to lung cancer patients, whereas central airway obstruction (CAO) confers stage IIIA or IIIB depending on laterality of nodal involvement. Despite lower stage, patients with malignant CAO experience significant morbidity due to persistent cough, dyspnea, obstructive pneumonia, and respiratory failure and as many as 35-40% of lung cancer patients die due to complications resulting from loco-regional disease. We compared the survival in these two groups of patients.

Methods
This is a retrospective review of medical records of patients undergoing treatment for advanced lung cancer presenting as malignant CAO and MPE between January 2011 and December 2013 at a tertiary centre.

Results
Eighty four patients were treated for advanced lung cancer. 43 had malignant CAO and 41 had MPE at the time of diagnosis. All patients with CAO underwent re-canalization and all patients with MPE underwent pleural fluid drainage. Both groups received relevant cancer targeted therapy. Adenocarcinoma was significantly more common in the MPE group (27 vs. 13, p=0.002). All patients died in the MPE group within 3.5 years post-diagnosis. 15 (36.5%) patients carried EGFR mutation in exon 19 and 21. Twenty one patients received tyrosine kinase inhibitors for > 1 month. In the malignant CAO group, 32 (74.4%) died, with a quarter of them still alive after 5 years, (p=0.0005). 3 (7%) patients were requiring assisted mechanical ventilation from respiratory failure caused by malignant CAO. Median (range) survival in the MPE group and malignant CAO group was 7.9 (0.1-42.5) and 5.7 (0.3-62) months, p=0.71 respectively.

Conclusions
There was no difference in survival between patients with MPE and malignant CAO caused by advanced lung cancer. This lack of difference in survival despite the advanced stage of MPE, and greater morbidity associated with malignant CAO advocates in favour of bronchoscopic re-canalization of the CAO and dispels nihilism associated with them.

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Image or Table

Table 1. Subgroup analysis of patients with malignant CAO and malignant pleural effusion.

	Malignant central airway obstruction (N=43)	Malignant pleural effusion (N=41)	P value
Age	63 (32-86)	71 (38-93)	0.10
Gender (male)	32 (74.4%)	23 (56%)	0.10
Pleural effusion	--	41 (100%)	
Central airway obstruction	43 (100%)	1 (2.4%)	0.0001
Histology			
Adenocarcinoma	13 (30.2%)	27 (65.8%)	0.002
Squamous cell carcinoma	16 (37.2)	--	
NSCLC	8 (18.6%)	1 (2.4%)	0.02
Small cell carcinoma	3 (6.9%)	2 (4.8%)	1.0
Sarcomatoid carcinoma	2 (4.6%)	--	
Others	1 (2.3)	11 (26.8%)	0.001
Re-canalization	43 (100%)	--	
Laser resection	25 (58.1%)	--	
Stent placement	17 (39.5%)	--	
Both	3 (6.9%)	--	
Pleural drain	--	41 (100%)	
EGFR mutation Exon 19 & 21	4 (9.3%)	15 (36.5%)	0.003
Chemotherapy	11 (25.5%)	15 (36.5%)	0.34
Radiotherapy	20 (46.5%)	7 (17%)	0.005
TKI's	4 (9.3%)	21 (51.2%)	0.001
Deaths	32 (74.4)	41 (100%)	0.0005
Median (range) survival	175 (10-1888)	241 (4-1294)	0.71

(115) Submission ID#407956

Outcome of Patients Having Advanced Lung Cancer with or without Malignant Central Airway Obstruction

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Akash Verma – Tan Tock Sneg Hospital, Singapore

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Background
Thirty percent of patient with advanced lung cancer present with malignant central airway obstruction (CAO). These patients experience significant morbidity due to persistent cough, dyspnea, obstructive pneumonia, and respiratory failure and as many as 35-40% of lung cancer patients die due to complications resulting from loco-regional disease. We compared the survival in patient with, and without malignant CAO from underlying advanced lung cancer.

Methods
This is a retrospective review of medical records of patients undergoing treatment for advanced lung cancer between January 2008 and December 2017 at a tertiary centre.

Results
Eighty five patients were treated for advanced lung cancer out of which 43 had malignant CAO and 42 did not. All patients with CAO underwent re-canalization. 3 (7%) patients were requiring assisted mechanical ventilation from respiratory failure caused by malignant CAO. Both groups received relevant cancer targeted therapy. Squamous cell carcinoma was significantly more common in the malignant CAO group 16 (37.2%) vs. 3 (7.1%), p=0.001. Thirty two (74.4%), and 40 (95.2%) patients died in the group with and without CAO, p=0.26 respectively. Median (range) survival in the group with and without CAO was 5.7 (0.3-62) vs. 9.2 (0.7-78.2) months, p=0.71 respectively. More patients received chemotherapy in the group without CAO 23 (54.7%) compared to those with CAO 11 (25.5%), p=0.008.

Conclusions
There was no difference in survival between patients with or without malignant CAO caused by advanced lung cancer. This similar survival despite more number of sicker patients in CAO group, and fewer receiving chemotherapy, is encouraging bronchoscopic re-canalization of the CAO and dispels nihilism associated with them.

Uploaded File(s)

Image or Table

Table 1. Subgroup analysis of advanced lung cancer with and without CAO.

	Advanced lung cancer *with* CAO (N=43)	Advanced lung cancer *without* CAO (N=42)	P value
Age	63 (32-86)	67 (48-84)	0.49
Gender (male)	32 (74.4%)	30 (71.4%)	0.81
Pleural effusion	--	11 (26.1%)	
Central airway obstruction	43 (100%)	--	
Histology			
Adenocarcinoma	13 (30.2%)	17 (40.4%)	0.36
Squamous cell carcinoma	16 (37.2)	3 (7.1%)	0.001
Non-small cell lung cancer	8 (18.6%)	9 (21.4%)	0.79
Small cell carcinoma	3 (6.9%)	7 (16.6%)	0.18
Sarcomatoid carcinoma	2 (4.6%)	1 (2.3%)	1.0
Others	1 (2.3)	4 (9.5%)	0.20
Re-canalization	43 (100%)	--	
Laser resection	25 (58.1%)	--	
Stent placement	17 (39.5%)	--	
Both	3 (6.9%)	--	
Pleural drain	--	11 (26.1%0	
EGFR mutation Exon 19 & 21	4 (9.3%)	4 (9.5%)	1.0
Chemotherapy	11 (25.5%)	23 (54.7%)	0.008
Radiotherapy	20 (46.5%)	21 (50%)	0.82
Tyrosine kinase inhibitors	4 (9.3%)	9 (21.4%)	0.14
Deaths	32 (74.4)	40 (95.2%)	0.26
Median (range) survival	175 (10-1888)	281 (24-2381)	0.30
≥Three month survival	10 (23.2)	4 (9.5)	0.14
≥Six month survival	7 (16.2)	12 (28.5)	0.29
≥12 month survival	13 (30.2)	15 (35.7)	0.64

(116) Submission ID#407518

Outcomes Differences Between Re-canalized Malignant central Airway Obstruction from Endoluminal Disease versus Extrinsic Compression

Submission Type: Oral Presentation ONLY

Submission Status: Complete

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

Signed: *Akash Verma* (11/15/2017, 5:59 PM)
No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
In malignant central airway obstruction (CAO), surgery is often contraindicated, chemotherapy is of uncertain benefit, and radiotherapy does not have immediate effect on relief of CAO. Only mechanical and thermal bronchoscopic techniques such as stent placement and laser resection offer instantaneous benefit. We examined the effectiveness of Nd:YAG laser therapy or stent placement for malignant CAO at our centre over a 10 year period.

Methods
This is a retrospective review of medical records of patients undergoing Nd:YAG laser therapy or self-expanding metal stent (SEMS) placement for malignant CAO between November 2007 and October 2017 at a tertiary centre.

Results
Seventy two patients were treated for malignant CAO. The median (range) age was 63 (23-86) years, and 49 (68%) were males. Patients underwent re-canalization of CAO either with laser therapy (n=36), stent placement (n=30), or both (n=6). Fifty one (71%) patients died and median (range) duration of survival was 7.2 (0.3-76.4) months. In subgroup analysis, greater proportion of patients had oesophageal cancer in the stent placement group compared to laser resection group (10 (33.3%) vs. 0, p=0.0001), and left main bronchus was the more commonly involved site of CAO in the former 16 (53.3%) vs. 8 (22.2%) in the laser resection group, p=0.01. Less patients died 21 (58.3%) vs. 25 (83.3%) p=0.03, and median survival was longer 12.4 (0.3-76.4) months in the patients treated with laser resection compared to stent placement group 4.5 (0.3-52) months, p=0.0004. The complication rate was similar among the 2 groups.

Conclusions
Malignant CAO from endoluminal lesions re-canalized using Nd:YAG laser carries better prognosis than malignant CAO from extrinsic compression re-canalized with SEMS. Laser resection of endoluminal malignant CAO is safe and effective modality.

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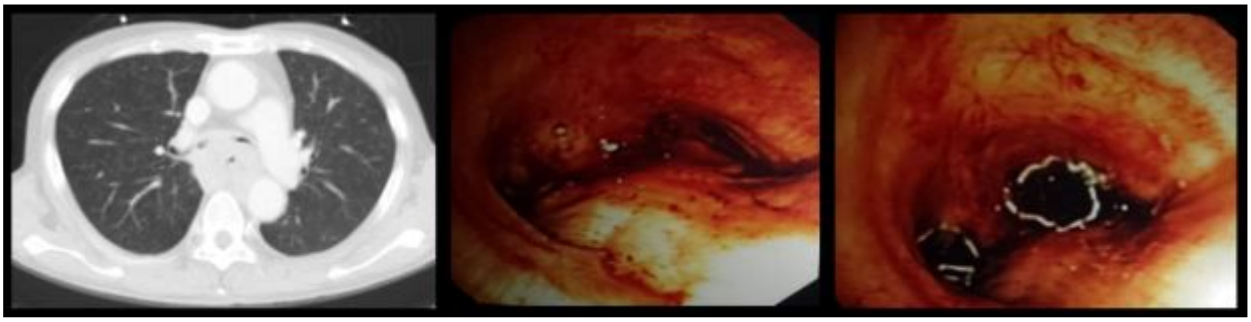

(117) Submission ID#459477

Pediatric bronchoscopy in a latam andean country

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Maria Arauz-martinez – SOCIO-WABIP

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Respiratory endoscopy is a useful and safe technique that allows inspection of the airways, diagnostic or therapeutic purposes. We report initial experience about usefulness of bronchoscopy in a Latinamerica andean pediatric hospital at 2860 meters above sea level.

Methods

retrospective study with analitic component of the bronchoscopies performed in respiratory endoscopy service

since February 2014 to August 2017. Database of respiratory endoscopy.

Results

316 bronchoscopies were performed in 200 pediatric patients, of whom 169 required more than one procedure. Gender: male 190 cases (60.12%) and female 126 cases (39.87%). Mean age: 8 years (range: 0.1-17), mean weight: 18.6 kg (range: 2.3-60). Immunocompromised: 19.3%. Flexible fiberoptic bronchoscopy: 218 (68.98%) and rigid: 80 (25.31%), we used combined techniques in 18 cases (5.69%). The five main hospital areas requesting bronchoscopies were paediatric intensive care unit 78 (24.6%), clinic room 62 (19.6%), infectology room 38 (12%), neurology room 34 (10.7%) and emergency room 29 (9.1%). Main indications were nosocomial pneumonia 90 (28%), assessment of airway 81 (25.6%), bronchiectasis with or without cystis fibrosis 57 (18%), atelectasis 42 (13.6%), foreing body airway 27 (8.5%) and bleeding airway 19 (5.4%).

Bronchoalveolar lavage (BAL) carried out with rescue 52%: bacterial, viral or parasitic. The main germs were Pseudomona aeruginosa 64 (20%) three of which presented multiresistance, Klebsiella neumoniae 41 (12.9%), Candida 21 (6.6%), Acinetobacter baumani 19 (6%), Serratia marcescens 5.3%; we rescue respiratory syncytial virus, H1N1 virus, Koch bacillus and Paragonimos each with 0.3%.

Complications: 0.6%, bradychardia and severe hipoxemia 1, pneumothorax 1, both two were treated in room of endoscopy.

Conclusions

Rigid and flexible bronchoscopy in children is a useful and safe procedure. Its practice in an andean pediatric hospital at high altitude has similar rate of complications than those reported by other groups.

(118) Submission ID#479484

Peritube flexible bronchoscopy. A useful and safe endoscopic approach in critical patients

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Carlos Disdier Vicente – Interventional pulmonology department. Hospital Clinico Universitario Valladolid

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
flexible bronchoscopy (FB) is indicated in patients with orotracheal or tracheostomy intubation and mechanical ventilation (MV) for microbiological diagnosis, identify the source and extent of hemorrhage and/or suction of mucus and secretions. However, the insertion of an endoscope inside the tracheal tube (TT) can hinder ventilation and destabilize critical patients. The aim of our study is to review the usefulness and safety of FB performed in intubated patients when performed externally and parallel to the tracheal tube (PTFB).

Methods
We reviewed the bronchoscopic reports in which FBTP was performed. We analyzed indications, clinical severity, techniques performed, results and complications. FB was introduced by mouth or nose, externally and parallel to the orotracheal tube (OTT), introducing the endoscope in glottis through the anterior commissure of vocal cords, advancing it until the TT balloon was visualized, deflating it to advance the bronchoscope and inflating it again once the distal end of the TT is visualized to maintain pressurization. Cryotherapy or electrocautery was used for therapeutic indications

Results
26 PTFB were performed in 20 intubated patients. 19 men and one woman with mean age of 61 years (range 28-76 years). The internal diameter size of the OTT ranged between 7.5 and 8.5 and in four cases, ventilation was performed by tracheotomy intubation. 12 cases was indicated in critically ill patients with 100% FiO2, need for PEEP or difficult ventilation due to high pressures. 7 patients were treated for malignant central airway obstruction (MCAO). Two critical patients with MCAO due to extrinsic compression were studied by cTBNA. 8 cryorecanalization were performed in 4 patients, 4 coagulation extractions by cryoadherence and two cryotherapy treatments associated with electrocautery. In 93% of patients in whom therapeutic bronchoscopy was performed (14/15) immediate improvement was obtained. No postbronchoscopy infections, hemodynamic or gas exchange deterioration were recorded. Two cases a postprocedure pneumothorax was found, not attributed to the peritube approach.

Conclusions
PTFB allows diagnostic and therapeutic endoscopic procedures of great value in patients supported with MV. FB was performed without interfering with the lumen of the TT. Whith this approach, the ventilatory mode and parameters, oxygenation and pressurization of the airways were maintained while the endoscopist was working. Cryotherapy with cryorecanalization/cryoadherence of tumor or clots are invaluable techniques in this

setting.

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(119) Submission ID#477845

Photodynamic therapy using NPe6 for peripheral-type lung cancers using composite-type optical fiberscope of 1.0 mm in diameter.

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Jitsuo Usuda – Department of Thoracic Surgery, Nippon Medical School

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Photodynanic therapy (PDT), is a treatment modality for many cancers, and uses a tumor-specific photosensitizer and laser irradiation. Recently, we have developed a new minimally invasive laser device using a 1.0 mm in diameter composite-type optical fiberscope (COF), which could transmit laser energy and images for observation in parallel.
In this study, we aimed to develop a new endobronchial treatment for peripheral cancer using PDT and a COF, and we evaluated the feasibility of PDT using COF for peripheral lung cancer.

Methods
This phase I study enrolled patients with peripheral lung cancers (primary tumor< 20 mm, stage IA), which were definitively diagnosed by bronchoscopic modalities. We conducted irradiation using a diode laser (664 nm) and a COF 4 hours after the administration of NPe6 40 mg/m2. We evaluated the tumor lesions using EBUS, and then we introduced the COF into the peripheral lung cancer, and irradiated of red light 664 nm (120 mW, 50 J/cm2).

Results

Seven patients met our criteria, and 5 cases were adenocarcinoma and 2 case squamous cell carcinoma. We were able to observe the cancer lesions at the peripheral lung by the COF, and feasibly irradiated. Two weeks and 3 months after NPe6-PDT, complications such as pneumonia and pneumothorax were not found, but one mildly found light skin-photosensitivity. Six months later, we found CR in 3 cases and SD in 4 cases.

Conclusions

The 1.0 mm COF was a very useful device of NPe6-PDT for peripheral lung cancers, and PDT using the COF was a feasible and non-invasive treatment. In the future, for non-invasive adenocarcinoma such as AIS, NPe6-PDT will play an important role.

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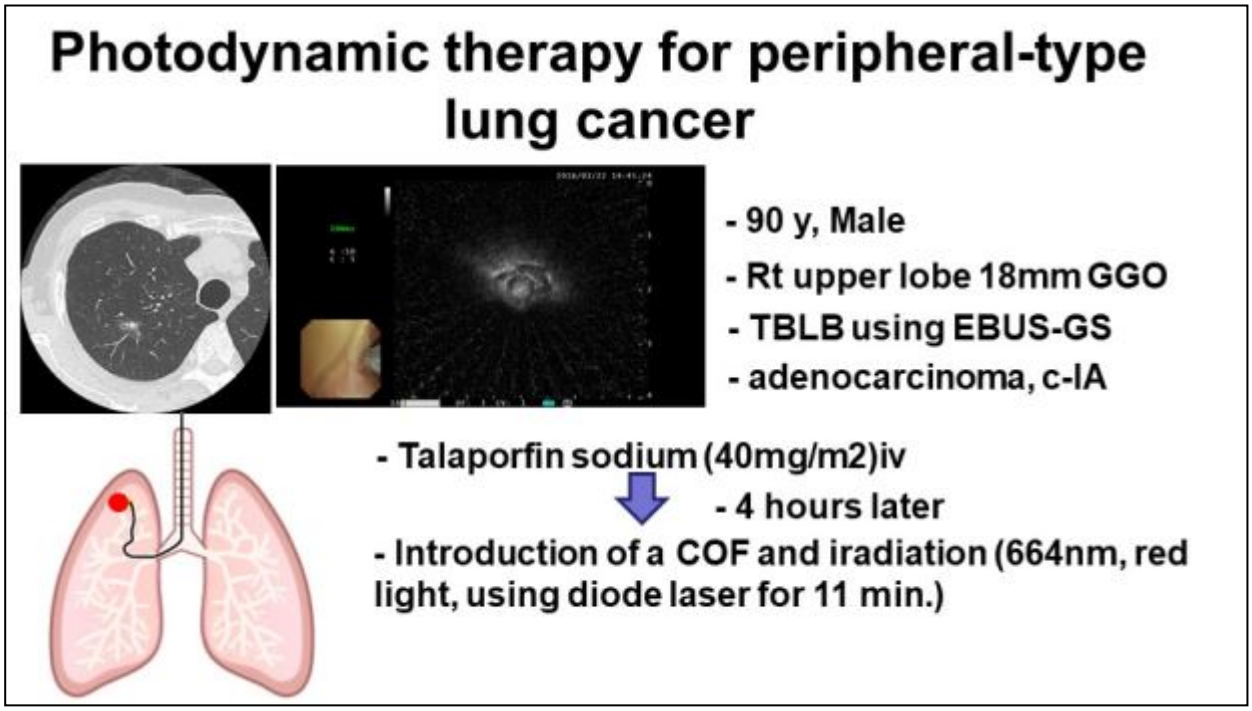

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(120) Submission ID#423307

Physician-based endobronchial ultrasound-guided sampling techniques are not inferior to virtual bronchoscopic navigation combined with endobronchial ultrasound to diagnose peripheral pulmonary lesions: a randomised trial.

Submission Type: Oral Presentation ONLY
Submission Status: Complete
Submitter: Anan Wattanathum – Phramongkutklao Hospital

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Bronchoscopy using endobronchial ultrasound (EBUS) can help to diagnose small peripheral pulmonary lesions. However, although biopsy sites can be confirmed, a physician needs to localize the lesions prior to the bronchoscope by using CT scan. Virtual bronchoscopic navigation (VBN) is a new method in which the bronchoscope is guided on the bronchial route to a peripheral lesion using virtual bronchoscopic images, but its value has not been confirmed.

Methods
This single blind randomized controlled trial compared the diagnostic yield between EBUS-GS with VBN-guide and EBUS-GS without VBN-guide for diagnosis small pulmonary lesions. 38 patients with small pulmonary lesion (diameter 40 mm.) were randomly assigned to VBN-guide or non-VBN-guide group. Lesion of specimen sampling were verified using EBUS-GS under fluoroscopy. Bronchial brushing, transbronchial biopsy and bronchoalveolavage was performed for diagnostic procedure. The pathologists were blinded to the results of randomization.

Results
The diagnostic yield in VBN-guide group was not higher than non-VBN-guide group (68.4% vs 81.3%, p = 0.461). EBUS-visualized lesion in VBN-guide group and non-VBN-guide group was 84.2% and 100%, p = 0.234. The duration of total examination and time to found lesion was not different in VBN-guide and non-VBN-guide group (mean ± SD, 30.16 ± 8.61 vs 31.88 ± 8.45, P = 0.557, and 10.16 ± 7.4 vs 8.38 ± 4.24, p = 0.380, respectively). Adverse events were mild bleeding for 2 cases in each group.

Conclusions
The diagnostic yield for small pulmonary lesions is not increased when VBN is combined with EBUS-GS.

(121) Submission ID#454532

Pleural dye marking using Virtual Bronchoscopy and Radial Endobronchial Ultrasound before sublobar pulmonary resection for small peripheral nodules (<15mm) and ground glass opacities.

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Samy Lachkar – Clinique Pneumologique

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Minimally invasive surgery of small pulmonary nodules and especially Ground Glass opacities (GGOs) allows suboptimal palpation of the lung compared to open thoracotomy. The objective of this study was to assess endoscopic pleural dye marking using virtual bronchoscopy and radial endobronchial ultrasound (r-EBUS) to localize small peripheral lung nodules and GGOs, immediately before minimally invasive resection.

Methods
Both bronchial path to nodule (with virtual bronchoscopy software) and sub-pleural methylene blue deposition were performed in the operating room immediately before minimally invasive surgery. A 4 mm fiberscope with a 2 mm working channel, 1.4 mm r-EBUS probe and guide sheath were usedin patients in operating position under general anesthesia without fluoroscopy. One ml of methylene (0.5%) was instilled into the guide sheath, wedged in the subpleural space. Wedge resection or segmentectomy were guided by visualization of the dye on the pleural surface. Contribution of dye marking to the surgical procedure was rated by the surgeon.

Results
Thirty-five nodules, including 10 pure GGOs, were resected by video-assisted thoracoscopic wedge resection (n = 18) or robotic-assisted thoracoscopic surgery (16 segmentectomies and 1 wedge resection). The median greatest diameter of nodules was 8 mm (3-15mm) . Median distance to pleura was 10 mm (2 - 27 mm). No complication due to dye marking was reported and no conversion to open thoracotomy was needed. The endoscopic procedure added an average 10 min to surgical resection. The dye was visible on the pleural surface in 33 cases. Histological diagnosis and free margin resection were obtained in all cases. Median skin-to-skin operating time was 90 min for robotic segmentectomy and 40 min for video-assisted wedge resection. The same operative precision was considered impossible by the surgeon without dye marking in all cases for the 10 GGOs and in 20 cases (80%) for the 25 solide nodules.

Conclusions

Pleural Dye marking using virtual bronchoscopy and r-EBUS can be easily and safely performed to localize small pulmonary nodules and especially GGOs, immediately before minimally invasive resection.

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Dye marking WCBIP2.pptx

(122) Submission ID#477972

Pneumomediastinum After EBUS-TBNA

Submission Type: Case Report

Submission Status: Complete

Submitter: Amit Tandon – Henry Ford Hospital

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Endobronchial ultrasound-transbronchial needle aspiration (EBUS-TBNA) is the modality of choice for minimally invasive staging of lung cancer. In a recent review of the AQUIRE registry complications occurred in less than 2% of subjects, with the most common being bleeding and pneumothorax. The complication rate was higher in patients who underwent EBUS-TBNA in combination with transbronchial or endobronchial biopsy. We found three reports of penumomediastinum after TBNA in the literature. The first case reported using a traditional Wang 19-gauge needle; the second case was related to EBUS-TBNA using a 21-gauge needle; and the third did not report the size needle and also performed endobronchial biopsies. Here we present the first case of delayed pneumomediastinum after EBUS-TBNA using a 22-gauge needle.

Case Report
A 74 year old male former smoker with newly diagnosed lung adenocarcinoma presented for a staging bronchoscopy with EBUS-TBNA after PET CT identified FDG uptake in bilateral hilar lymph nodes. The procedure was performed under moderate sedation with 12 milligrams of midazolam and 6 milligrams of morphine sulfate. Five samples were obtained from station 11L (6.8 millimeters), and three samples from station 11Rs (9.8 millimeters). After the procedure the patient was monitored for approximately one hour prior to discharge without any symptoms of chest pain or shortness of breath.

The next morning, he presented to the emergency room with worsening neck and face swelling which started approximately eight hours after the procedure. A chest radiograph showed subcutaneous emphysema in the proximal neck without pneumomediastinum or pneumothorax. This was followed by a computed tomography of the neck and chest which confirmed pneumomediastinum without pneumopericardium. He was monitored in the ICU for 48 hours with slow improvement of subcutaneous emphysema and was discharged with follow up imaging which showed continued improvement. No interventions were needed.

Conclusion
Pneumomediastinum may be caused by three mechanisms: traumatic disruption of local gas-filled structures (lungs or GI tract), rupture of the terminal bronchioles or alveoli, and due to mediastinitis with gas producing organisms. Our report suggests that pneumomediastinum can be seen as a complication of EBUS-TBNA even when using a 22-gauge needle and sampling hilar lymph nodes. Although rare, clinical signs and symptoms should raise proper suspicion to avoid delay of treatment. As with our patient and the previous

reported cases, conservative management is usually the preferred strategy.

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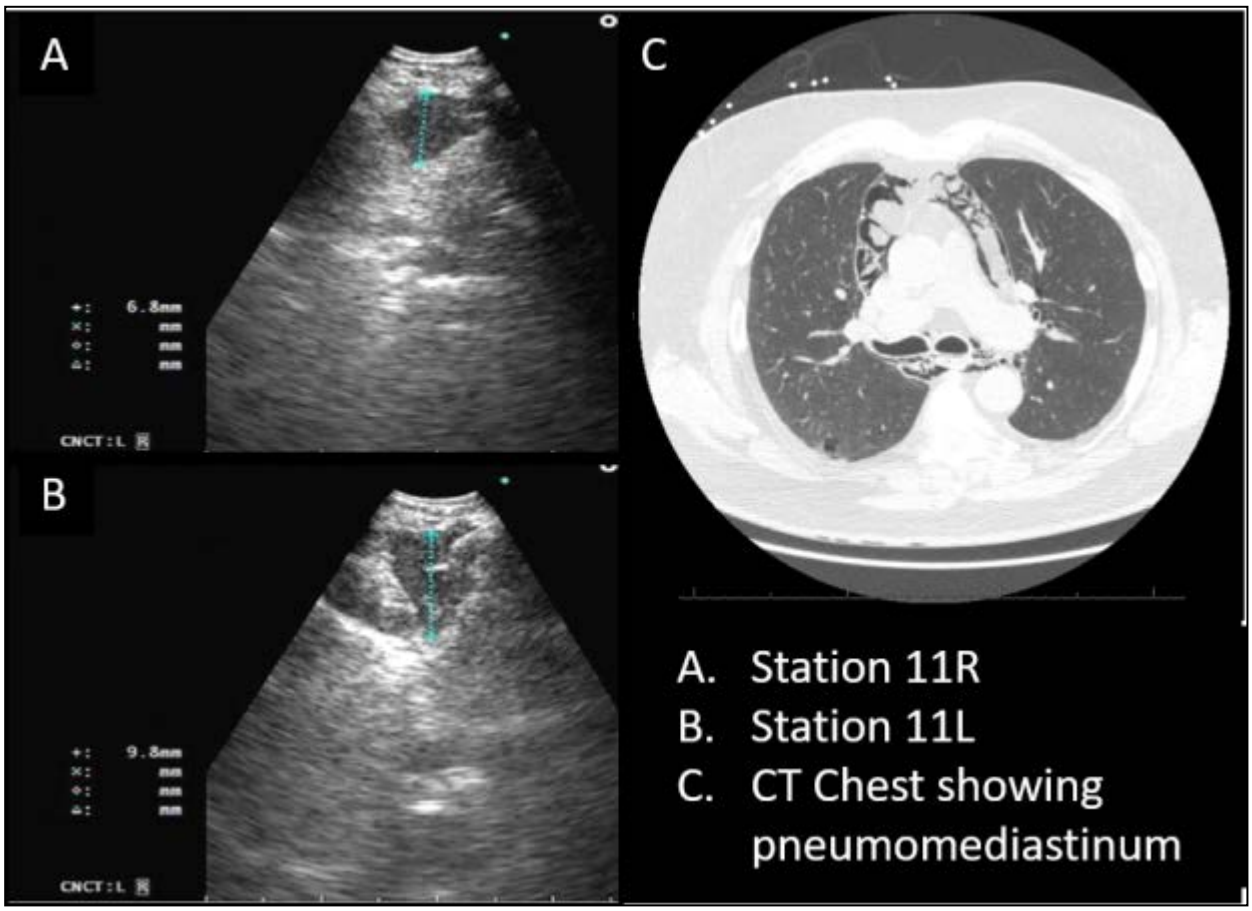

(123) Submission ID#427221

Predicted malignancy in pulmonary lesion by using tumor inspector version 1 program in Phramongkutklao hospital

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Bronchoscopy had been performed for decade for tissue diagnosis of pulmonary nodules. Pulmonary nodules can be originated from any caused, ranging from benign granuloma or infectious process to malignancy. Establishing the etiology of pulmonary nodule in accurate manner assumes critical importance, Because surgical lung resection in early stage of lung cancer provides the best chance for cure. Nowadays, endobronchial ultrasound (EBUS) is a standard procedure that used to diagnose pulmonary nodule. The characteristic of pulmonary nodules from EBUS can differentiate benign from malignant. However, the interpretation of EBUS findings depends on pulmonologists experienced. So we developed a software that call tumor inspector program Ver. 1 for helping to interpreted characteristic of pulmonary nodules from EBUS. We attempted to analyze the performance of this software.

Methods
We conducted a cross-sectional study of 208 patients who underwent radial-probe EBUS-guided bronchoscopy for the investigation of pulmonary nodules between May 2015 and December 2016 in Phramongkutklao hospital. For diagnosis, we obtained a pathological tissue from bronchial brushing and transbronchial biopsy. The characteristic findings from EBUS was analyzed and diagnosed by tumor inspector program ver.1 and three pulmonary interventionists.

Results
Two hundred and eight patients with a mean age of 61 ± 1 years were included in the study. The pathological reports were benign 80 cases (38.46%) and malignant 128 cases (61.54%). The sensitivity, specificity, negative predictive value, and diagnostic accuracy by pulmonary interventionists were calculated as 90.%, 22.5%, 60%, and 64.4%, respectively. On the other hand, the diagnosis by tumor inspector program Ver.1 showed a sensitivity of 90.0%, a specificity of 81.2%, a negative predictive value of 84.4% and an accuracy of 87%.

Conclusions

The results indicate that tumor inspector Ver.1 program is highly sensitive and accuracy diagnostic to differentiate benign from malignant in pulmonary nodule patients.

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(124) Submission ID#453016

Profiling of lung microbiota in the patients with obstructive sleep apnea

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Dongmei Lu – MAYO CLINIC

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Role: Presenting Author
Disclosure:
Disclosure Status: Complete
Disclosure: Nothing to Disclose
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Lung microbiota may affect innate immunity and treatment consequence in the Obstructive Sleep Apnea(OSA) patients.

Methods

Bronchoalveolar lavage fluid(BALF)was obtained from 11 OSA patients and 8 patients with other lung diseases as control, and used for lung
microbiota profiling by PCR amplification and sequencing of the microbial samples.

Results

It was demonstrated that phyla of Firmicutes, Fusobacteria, and Bacteriodetes were relatively abundant in the lung microbiota. Alpha-diversity comparison between OSA and control group revealed that Proteobacteria and Fusobacteria were significantly higher in OSA patients (0.3863 ± 0.0631 and 0.0682 ± 0.0159, respectively) than that in control group (0.119 ± 0.074 and 0.0006 ± 0.0187, respectively, $p < 0.05$ for both phyla). In contrast, Firmicutes was significantly less in OSA patients (0.1371 ± 0.0394) compared to that in the control group (0.384 ± 0.046, $p < 0.05$). Comparison within a group (ß-diversity) indicated that the top 5 phyla in the OSA lung were Proteobacteria, Bacteroidetes, Firmicutes, Fusobacteria, and Acidobacteria. while the top 5 phyla in the control group were Firmicutes, Bacteroidetes, Proteobacteria, Actinobacteria, and Acidobacteria.

Conclusions

These findings indicated that lung microbiota in OSA is distinct from that of healthy subjects. Manipulation of the microbiota may be an alternative strategy to augment airway immunity and to reduce susceptibility to airway infection.

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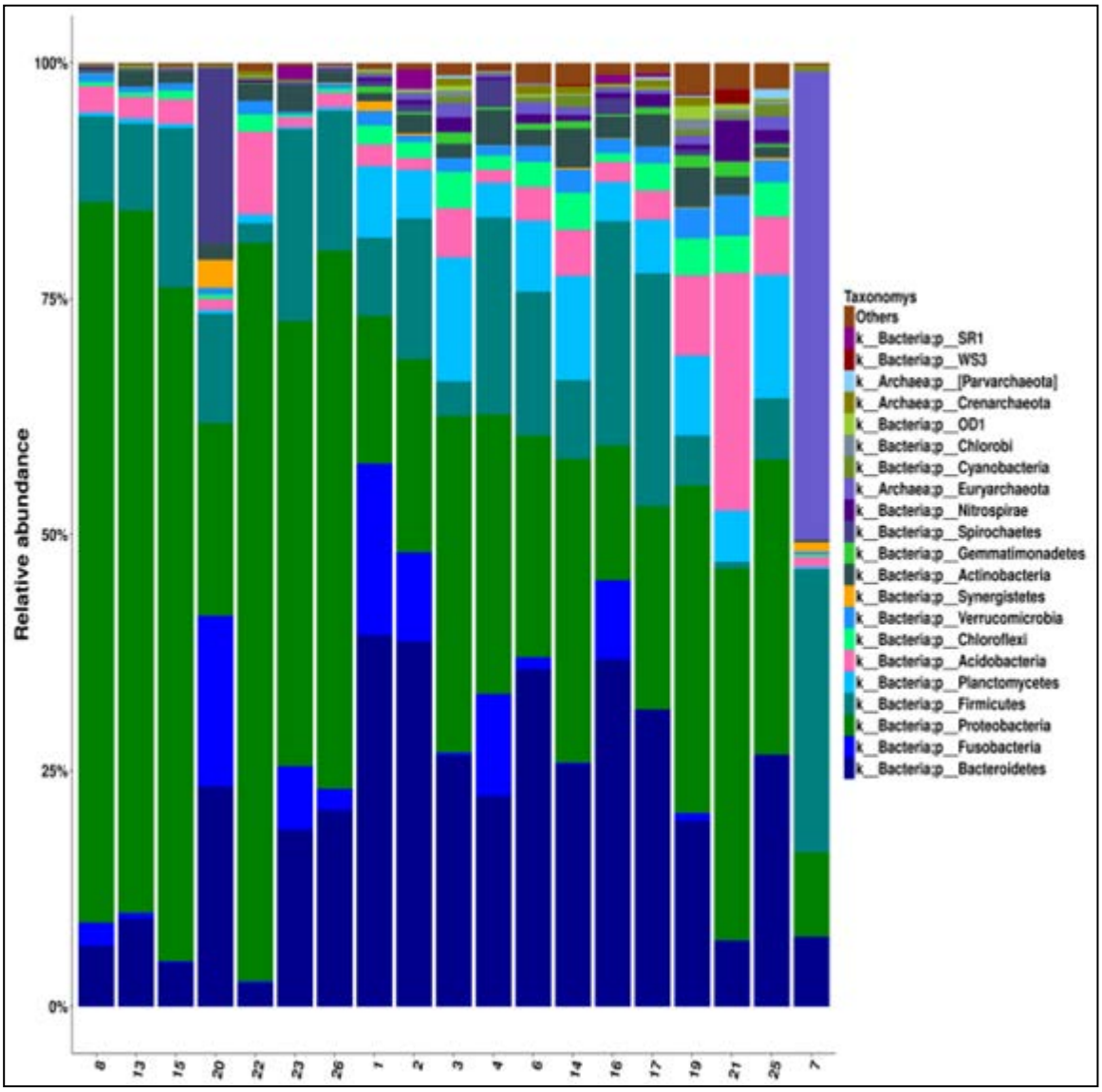
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(125) Submission ID#458543

Prospective Study Of Endobronchial UltrasoundGuided Transbronchial Needle Aspiration (EBUS-TBNA) in Non Small Cell Lung Cancer (NSCLC) Stadification: How Many Passes Are Adequate for PET Positive and Negative Lymph Nodes (LN)?

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Noelia Cubero – Hospital Universitari de Bellvitge. AAER. EIB

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Disclosure Status: Complete
Disclosure: Nothing to Disclose
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
It is recommended in the absence of rapid on-site evaluation (ROSE) in patients suspected of having lung cancer and undergoing EBUS-TBNA for diagnosis, that a minimum of 3 separate needle passes be performed per sampling site (Ungraded Consensus-Based Statement)1. However it is still unclear if there is a difference between PET-positive LN and those PET negative. The purpose of the present study was to elucidate the number of passes
needed for PET positive or negative LN.

Methods
A prospective study was performed from 2012 to 2017 at the Bellvitge University Hospital, 35 patients with diagnosed NSCLC were recruited. The patients underwent 3 passes of EBUS-TBNA in 45 lymph nodes found during the procedure that were bigger than 5 mm. The 3 passes were studied by ROSE and by cell block, each pass separately. LN were divided by PET results. The results of the passes and the final diagnosis were analyzed.

Results
A total of 35 patients were selected, 85,7% of them were male with an average age of 66.9 years. All of them have been diagnosed of NSCLC prior to the test performance, 34,3% were adenocarcinoma and 65,7% squamous cell carcinoma. ROC analysis and Sensitivity has been assessed for each of the two groups of LN (PET + and PET-) and the results were compared for each pass. We observed that in PET positive LN there is a significant improvement in the sensitivity if 3 passes were performed, while in PET negative LN there is no significant difference in the diagnostic yield between one or three passes. There is no significant difference if the LN were <10 mm or >10 mm. There is neither significant difference if the tumor was an Adenocarcinoma.

Conclusions
In NSCLC stadification by EBUS-TBNA, we recommend three passes in those PET-positive LN and only one in those PET-negative even if ROSE is available.

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EBUSNC2018.pptx

(126) Submission ID#476035

Prospective Utility of a Bronchial Genomic Classifier for Lung Cancer Detection

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Krish Bhadra – Rees Skillern Cancer Institute

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Disclosure:

Disclosure Status: Complete

Disclosure: Does Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Bronchoscopy is frequently used for evaluation of pulmonary lesions, but its sensitivity for detecting lung cancer can be limited. A bronchial genomic classifier (Percepta) has been validated to improve the sensitivity and negative predictive value of bronchoscopy for lung cancer diagnosis. When bronchoscopy is inconclusive, Percepta can identify patients who can be considered for CT surveillance instead of undergoing another invasive diagnostic procedure. We report here on the clinical utility of Percepta among patients enrolled in the Percepta Registry at up to 12 months post bronchoscopy.

Methods
Patients were prospectively enrolled at 40 medical centers when Percepta was ordered due to an inconclusive bronchoscopy. The classifier sample was obtained by brushing the right mainstem bronchus during bronchoscopy, regardless of nodule size or location. Pre- and post- classifier clinical management recommendations are recorded and follow-up clinical, procedure, and imaging data are collected over 36 months.

Results
399 patients had an inconclusive bronchoscopy and were within indication (no prior cancer and current or former smoker). The majority of lesions were <30mm (77%), peripherally located (72%), solid (73%), and upper lobe (55%). Advanced bronchoscopic technologies were used in 68% of cases and PET was used prior to bronchoscopy in 37% of patients.

This interim analysis focuses on the 245 patients (66%) with intermediate pre-test risk of malignancy. 32% of intermediate pre-test risk patients were down classified by Percepta to low risk. These results are consistent with the results from the AEGIS 1 and 2 studies (Silvestri et al, NEJM 2015) where 38% of intermediate pre-test risk patients were down classified ($p = 0.85$). Among patients where risk of malignancy was down-classified by Percepta, physicians significantly reduced invasive procedure recommendations from 41% to 18% (relative reduction of 56%, $p=0.0013$). 80% of those who were down-classified remained procedure free at 12 months follow up.

Conclusions

A bronchial genomic classifier can reduce the number of unnecessary invasive procedures that are performed following an inconclusive bronchoscopy for suspect lung cancer. We observed a significant reduction in additional invasive procedures compared to the pre-test management plan for patients who were down classified by Percepta after an inconclusive bronchoscopy. This reduction in procedures has been durable over 12 months. Additional data will help further determine the ultimate clinical utility of the test.

(127) Submission ID#477835

Pulmonary Alveolar Proteinosis treated by whole lung lavage: A Case Series and Long term following up of from a Tertiary Hospital in Viet Nam

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Giap Vu – Woolcock Institute of Medical Research- The University of Sydney

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Pulmonary alveolar proteinosis (PAP) is rare lung disease in which the alveolar spaces are filled with a proteinaceous phospholipid material that represents components of pulmonary surfactant. Common symptoms of PAP are cough and dyspnea, HRCT is the best image investigation to diagnosis PAP with a distinctive pattern called a crazy paving pattern. Whole-lung lavage has been a traditional method to treat the PAP. We performed this study to reach these objectives: 1. To describle the clinical, para-clinical features of pulmonary alveolar proteinosis. 2. To evaluate the effectiveness of whole lung lavage in treatment of pulmonary alveolar proteinosis.

Methods
It was a case series descriptive study with ten patients with PAP and treated by using modified whole lung lavage system in Respiratory Center Bach Mai Hospital from 2009 to 2017. The whole lung lavage system was modified and simplified with a double-lumen endotracheal tube, 2 long tubes connect with a warm up liquid in and out to suction.

Results
The ratio of males/females was 1/1. Age ranged from 21 to 52 years old. Clinical features: 100% patients had dyspnea and cough, only 1 case had hemoptysis. All patients had restrictive ventilatory defect. 2 patients had polycythemia. CXR: 10 patients had CXR image as bilateral perihilar and infrahilar groundglass opacity. Chest CT scan: bilateral perihilar and infrahilar infiltration and ground glass opacity with marked interlobular septal thickening. Bronchoscopy: 10 patients were not detected with any lesion in bronchus, BAL fluid was milky colored. Protein level in BAL fluid: the lowest was 2 to 7 g/l. All 10 patients were treated successfully with

whole lung lavage and had improvement in clinical symptoms, chest x-ray, blood gases after long term following up.

Conclusions

Modified whole lung lavage is very effective in improving clinical symptoms, chest x-ray, blood gases and quality of life of patients with pulmonary alveolar proteinosis.

(128) Submission ID#458391

Pulmonary Lymphatic Perfusion Syndrome (PLPS) Presenting with Chyloptysis: A Rare Symptom of a Rare Disease.

Submission Type: Case Report

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

We report a patient who presented with a rare symptoms due to a rare disease.

Case Report

A 45-year-old male former smoker presented with repeat dyspnea and cough productive of chunky white sputum, producible on demand. Notable history included childhood pneumonias, and recent diagnosis of immunoglobulin deficiency treated with intravenous immunoglobulin. CT chest revealed basilar predominant, right-sided extensive ground glass opacities. Outside bronchoscopy described abundant purulent secretions, with negative cultures and Periodic Acid Schiff (PAS) staining.

Planned open lung biopsy was cancelled due to clinical and radiographic resolution following bronchoscopy. Within weeks, the patients symptoms and radiographic abnormalities recurred, and he was referred to us for evaluation.

Anti-GMCSF antibody titers were negative. Repeat bronchoscopy demonstrated copious amounts of thin, creamy secretions throughout the tracheobronchial tree. Bronchoalveolar lavage (BAL) and Transbronchial biopsies were performed. Histopathology showed focal organizing pneumonia, patchy interstitial pneumonitis, and mild airways fibrosis without evidence of infection. The BAL contained chylomicrons and triglycerides, consistent with chylous sputum.

We referred the patient for intranodal lymphangiogram revealing a large tortuous thoracic duct (TD) with innumerable lymphatic collaterals demonstrating retrograde flow indicative of pulmonary lymphatic perfusion/chylolymphatic reflux, consistent with a diagnosis of pulmonary lymphatic perfusion syndrome (PLPS). Contemporaneously, the patient underwent successful percutaneous lymphatic coiling and glue embolization of his TD with complete sustained resolution of his symptoms.

The lymphatic system is an important component of the circulatory system and plays important role in immune regulation and fluid balance. It can be affected by various disease processes, which can present with dyspnea, hypoxia, or chylothorax. Chyloptysis is a rare presenting symptom, and difficult to recognize in the absence of chylothorax.

PLPS has been observed in all age groups and the onset of symptoms can be idiopathic or provoked by severe respiratory infection, trauma or by increase of the lymphatic flow owing to elevated central venous pressure that results in lymphatic distention. In our case, there was a high suspicion for pulmonary alveolar proteinosis (PAP), especially when the clinical picture improved with aggressive BAL via fiberoptic bronchoscopy. However, absence of PAS staining and anti GMCSF antibodies, and the presence of chylous sputum prompted a lymphangiogram which simultaneously confirmed the PLPS diagnosis and facilitated management by TD embolization to durably treat the disease.

Conclusion

Physicians must be alert to the possibility of pulmonary lymphatic disorders in patient presenting with recurrent milky secretions that improve with bronchoscopic BAL. Once the diagnosis is made, the management is straightforward.

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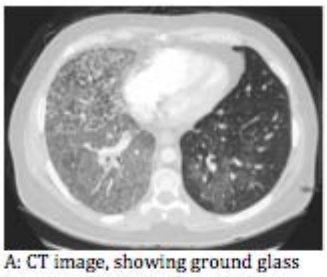
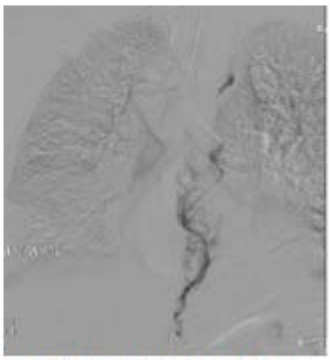


A: CT image, showing ground glass opacities mainly in the right lung.

B: Bronchoscopic view showing thin, creamy secretions in the airways.

C: BAL sample showing creamy white fluid.



D: Conventional lymphangiogram demonstrating abnormal flow toward the lung parenchyma.

(129) Submission ID#458984

Radial EBUS placement of nitinol coil fiducial markers for small peripheral lung nodules minimizes migration before stereotactic radiation therapy.

Submission Type: Oral and Poster
Submission Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Placement of fiducial gold markers (FMs) is useful before stereotactic radiotherapy of small peripheral lung nodule (PLN). However, FM migrations may compromise tracking accuracy. To overcome this difficulty, a new FM attached to a coil tail has been designed. The objective of this study was to assess the migration rate of these markers.

Methods
All patients benefited from r- EBUS guided placement of coil tailed FM for PLN < 25mm were included in this study. After sampling, the FM was introduced into the proximal tip of the bronchial brush sheath. The brush is reintroduced into the navigational guide sheath and one FM pushed into the nodule, without use of fluoroscopy. The performances, complications and migrations of the procedure were collected.

Results
Between June 2015 to August 2017, 26 patients had r-EBUS guided placement of a coiled tailed FM marker before stereotactic radiation therapy. The median long and short axis diameter of nodules were respectively 15,5 mm (8-25mm) and 9 mm (5-20mm) with 24 of 26 nodules (92%) exhibited a short diameter of less than 15mm. The procedure was performed under local anesthesia in 16 cases (62%). All nodule were reached and visualized with r-EBUS, with an US signal showing a centered probe in 22 cases and tangential in 4 cases.. No immediate complication was reported. 19 patients underwent stereotaxic radiation therapy with a median time between the two procedures of : 29 days (14-126). No FM migration occured between r-EBUS placement and radiotherapy. Pretreatment planning CT and at 3-month follow-up CT scan after the treatment showed that all FM stayed in direct contact with the lesions. No migration was also found in the 7 patients who have not been treated by radiotherapy (4 treated by surgery,2 follow up and 1 Chemotherapy).

Conclusions
Radial-EBUS for placement of nitinol coil tailed FM in PLN < 25 mm is a safe procedure that minimizes migration before stereotaxic radiation therapy.

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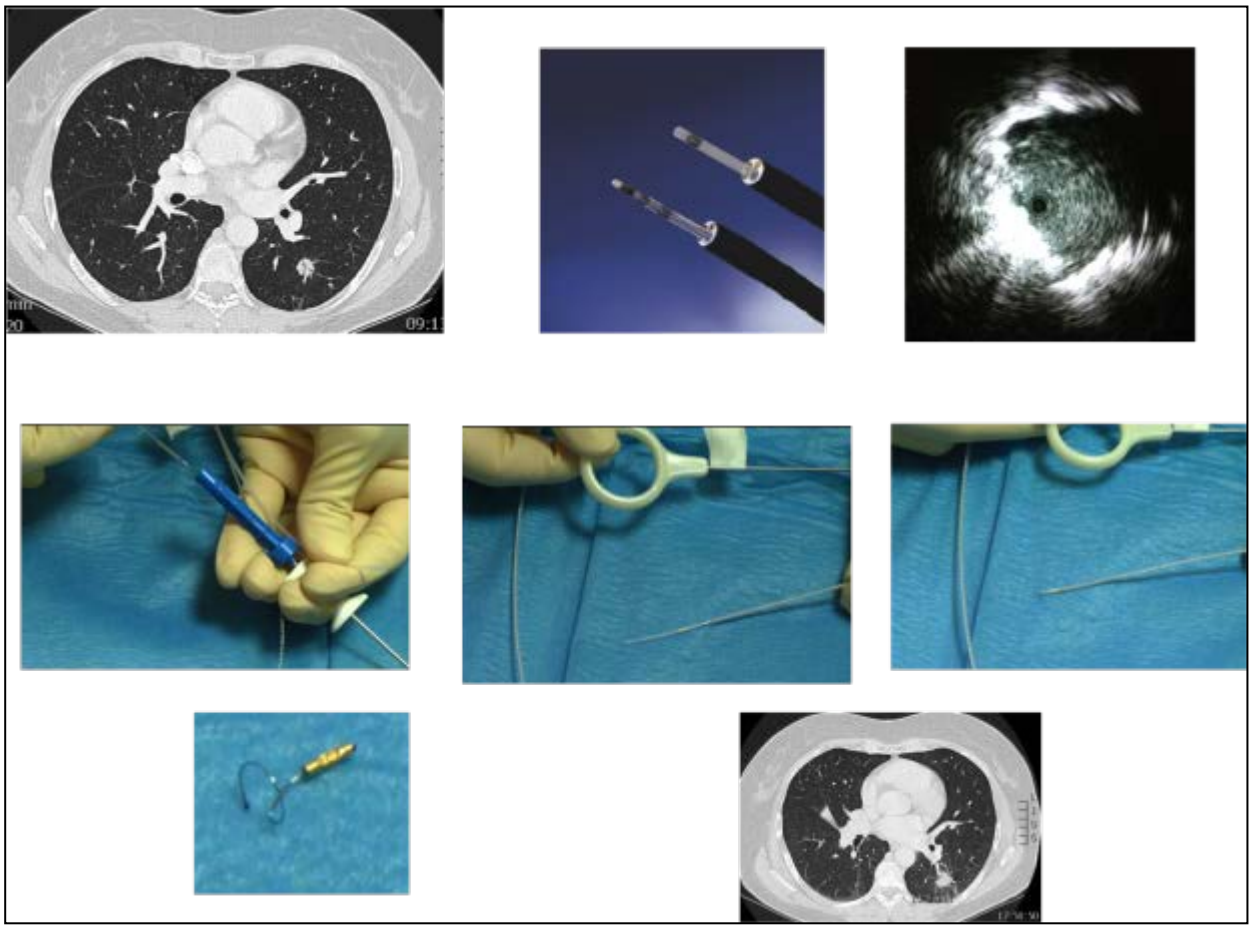

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(130) Submission ID#456868

Radial Endobronchial Ultrasound- Guided Transbronchial Lung Cryobiopsy

Submission Type: Oral and Poster

Submission Status: Complete

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Transbronchial lung cryobiopsy (TBLC) is a novel technique that has proved its diagnostic value in various diffuse parenchymal lung disease (DPLD) and non-interstitial lung pathology. Despite the rapid spread of TBLC, there is a substantial variability in procedural technique among interventional pulmonologists, diagnostic yield (20% non-diagnostic) and complication rate. Radial endobronchial ultrasound (R-EBUS) is a useful tool for precise localization and identification of ground-glass opacity (GGO) peripheral pulmonary lesions and can help identify target lung parenchyma without a major blood vessel leading to probably less bleeding complication. The objective of this study was to evaluate the use of R-EBUS in TBLC histopathological diagnosis for patients with DPLD as well as non-interstitial lung disease.

Methods
This was a prospective study that included patients with clinical and radiological features suggestive of DPLD or GGO from non-interstitial pulmonary disease who underwent TBLC under general anesthesia and fluoroscopy through a flexible bronchoscope. The R-EBUS probe was initially advanced to the desired lobe under fluoroscopic guidance until it reached 1 cm from the visceral pleura. R-EBUS images were identified looking for either blizzard or mixed blizzard signs without a major blood vessel adjacent to the target area (Figure 1). If such desired images were not seen then no biopsy was taken and another lung area was chosen. Samples from TBLC obtained were sent to pathology and microbiology laboratories for standard diagnostic analysis. Complications associated with the procedures were also noted.

Results
29 patients (10 women [35%]) with a mean age of 64 years were included. The mean area of the samples was 40.3 mm2. The mean number of samples per procedure was 3 (range, 1 to 6). Definitive diagnosis was obtained in 27 patients (93.1%). The most frequent histopathologic patterns were: 12 usual interstitial pneumonia (44.5%), 5 nonspecific interstitial pneumonia (18.5%), 3 pulmonary infection (11%), 2 acute fibrinous organizing pneumonia (7.4%), 1 sarcoidosis (3.7%), 1 cryptogenic organizing pneumonia (3.7%), 1 hypersensitivity pneumonitis (3.7%), 1 pleuroparenchymal fibroelastosis (3.7%) and 1 connective tissue disease-interstitial lung disease (3.7%). As for complications, there was 1 pneumothorax (3.4%) and 3 mild bleeding (10.3%) requiring suction without other endoscopic procedures.

Conclusions
The use of R-EBUS to appropriately locate and select target lung area prior to TBLC might increase diagnostic yield and decrease bleeding complication. Larger studies comparing TBLC histopathologic diagnosis with and without R-EBUS are needed to ascertain its clinical value.

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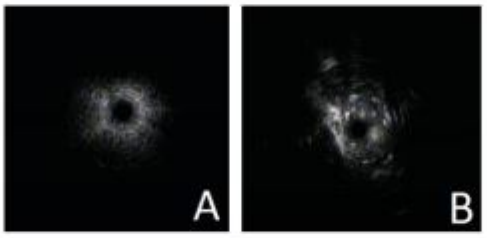

Figure 1: Representative R- EBUS imaging of: A) Blizzard sign (Increased white acoustic shadow mixed with normal lung), B) Mixed blizzard sign (Diffusely heterogeneous acoustic shadow with hyperechoic dots and vessels)

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Radial Endobronchial Ultrasound- Guided Transbronchial Lung Cryobiopsy.pptx

(131) Submission ID#459482

Radial ultrasound guided transbronchial cryobiopsy of a peripheral lung mass

Submission Type: Case Report

Submission Status: Complete

Submitter: Keenan Taylor – University of Nebraska Medical Center

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No financial relationships or conflicts of interest.

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

The diagnostic yield for transbronchial biopsy of peripheral lung lesions may be in part limited by sample size and crush artifact. Larger sample size may also be beneficial with the advent of personalized genotype directed therapies for lung cancer and need for molecular testing of samples.1 When compared to traditional forceps biopsy, transbronchial cyrobiopsy produces larger samples with lack of crush artifact.2

Case Report

A 79-year-old male with history of kidney transplant and prior tobacco abuse was referred to pulmonary clinic for recurrent pneumonias and abnormal CT scan. CT scan demonstrated a 6 cm left upper lobe mass as well as mediastinal and hilar lymphadenopathy highly suspicious for malignancy versus post-transplant lymphoproliferative disorder. A staged bronchoscopy procedure was performed starting with linear EBUS of lymph nodes, all of which were negative via ROSE. Next, the Olympus P-190 bronchoscope and radial ultrasound probe was utilized in conjunction with fluoroscopy to define the position and borders of the mass.

Traditional biopsy techniques were utilized via guide sheath including transbronchial forceps, brushing, and mini-lavage followed by fine needle aspirate. Due to minimal tissue yield from forceps biopsy despite large mass on radial, we proceeded with cryobiopsy. A 7 French Arndt endobronchial blocker was placed in the lingula and the scope was advanced just beyond the blocker. We advanced a 1.9 mm ERBE cryoprobe into the appropriate subsegmental airway under direct visualization and confirmed position by fluoroscopy as defined by prior radial ultrasound assessment. We utilized 3-4 second freeze times and obtained a total of 3 biopsies (Image 1). After each biopsy, the endobronchial blocker was inflated to occlude the lingula. The patient tolerated the procedure well with minimal bleeding and no pneumothorax. Histopathology from the cryobiopsy samples showed abundant tissue with invasive, poorly-differentiated non-small cell carcinoma. Lymph node cytology was adequate without malignant or atypical cells. Cytology from brushing, needle aspiration, and mini lavage of mass was suspicious but non-diagnostic due to minimal yield.

Conclusion

Radial ultrasound guided transbronchial cyrobiopsy of peripheral lesions produces larger sample sizes than traditional forceps biopsy. Despite larger sample sizes lacking crush artifact, limited studies have not shown a major difference in diagnostic yield. In our experience, cryobiopsy is especially of benefit when traditional forceps biopsy does not yield adequate tissue. There have been no reported pneumothoraces or episodes of severe bleeding.3,4 Further studies are warranted to evaluate the comparative yield and safety of transbronchial cryobiopsy of peripheral lung lesions.

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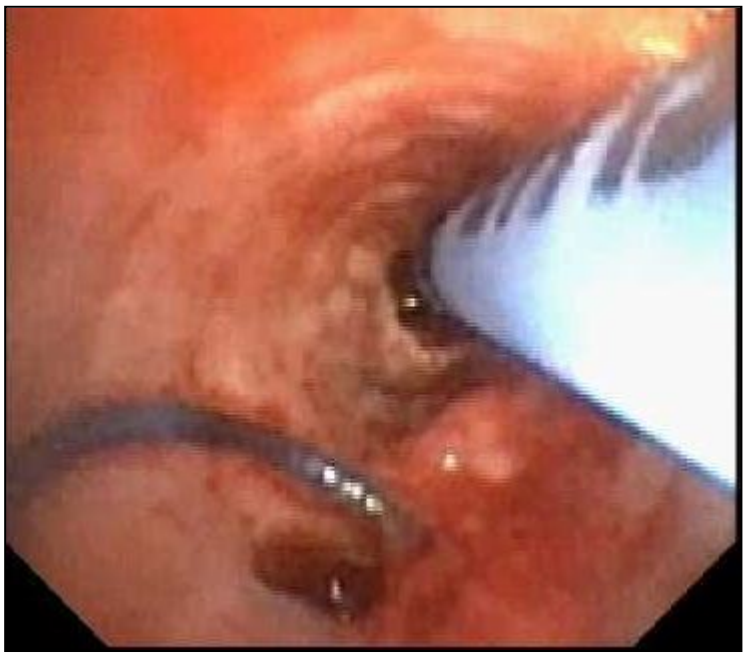

(132) Submission ID#477842

Radioactive seed implantation for small-cell-lung-caner(SCLC): a case report

Submission Type: Case Report

Submission Status: Complete

Submitter: Min Hu – The First Affiliated Hospital of Nanchang University,nanchang,jiangxi,P.R.China

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

Small-Cell-Lung-Caner(SCLC),fast-growing,has high degree of malignant and poor prognosis.Its the most common treatment is chemoradiotherapy.Sometimes the patient cant get adequate external radiotherapy dosage and the chemotherapy is ineffective.Under this circumstance,radioactive seed implantation may have better effects.Radioactive seed implantation is a new therapy that is to put radioactive source into the inside of tumor which can destroy the tumor by continuous rays.

Case Report

A 66-year-old Chinese male was diagnosed with SCLC accompanied by lymphatic metastasis of mediastinum in December 2012.He followed the treatment guidelines.And he received a 7 cycles of chemotherapy with etoposide and nedaplatin and a cycle of thoracic radiotherapy from December 2012.After that,he was treated

with 2 cycles of chemotherapy with irinotecan and nedaplatin because of disease progression.Besides,he chose radioactive seed implantation therapy in December 2012.He showed clinical benefits from radioactive seed implantation and chemoradiotherapy.The patient who has follow-up visits every three months is still living and his condition is stable.

Conclusion

Radioactive seed implantation ,less consumable,with small side effects ,can lower the rate of local recurrence and improve long term survival rate of patients.It can be used not only in palliative care but also in radical treatment.

(133) Submission ID#458518

Randomized controlled trial to evaluate the utility of suction and inner-stylet of EBUS-TBNA for mediastinal and hilar lymphadenopathy

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Xiaoxiao Lin – The First Affiliated Hospital of Wenzhou Medical University

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Role: Presenting Author

Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
The optimal procedure of endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) to maximize diagnostic yield and to minimize procedural complexity is controversial. We carried out the prospective randomized controlled trial to determine the optimal procedure of EBUS-TBNA for mediastinal and hilar lymphadenopathy with specific attention to the role of inner-stylet and suction.

Methods
Consecutive patients with enlarged mediastinal and hilar lymph nodes (LNs) detected by CT or PET-CT underwent EBUS-TBNA. Each LN was sampled with three passes, respectively using suction-stylet, suction-no stylet and stylet-no suction procedure. The samples were smeared onto glass slides for cytology. A single, blinded cytopathologist respectively evaluated each set of smeared slides. The primary outcomes were cytological specimen adequacy rate and diagnostic yield of malignant LNs. The secondary outcomes were the rate of tissue core acquisition, procedural time and the amount of bleeding.

Results
97 patients with a total of 255 LNs were evaluated. The final LN diagnosis was benign in 144, malignant in 104, inadequate in 7. The specimen adequacy rate of suction-stylet, suction-no stylet, stylet-no suction group was 87.1%, 88.2%, 85.9%, respectively, and diagnostic yield of malignancy was 32.2%, 31.8%, 31.0%, respectively, which all showed no statistical difference. But the use of suction was associated with an increase in the tissue core acquisition (P<0.001). No-stylet group significantly reduced procedural time (P<0.001). There was no significant difference in the amount of bleeding between procedures.

Conclusions
When EBUS-TBNA is necessary, our recommendation is omitting stylet usage and applying suction to increase tissue core acquisition and to reduce procedural complexity.

(134) Submission ID#458038

Recanalization of the fibrotic occluded bronchus caused by tuberculosis with cryotherapy

Submission Type: Oral and Poster

Submission Status: Complete

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Bronchial occlusion and atelectasis is a severe complication of tuberculosis. When the occlusion occurs in the main bronchus, the lung function lost a lot. Balloon dilation is a common used bronchoscopic method to treat benign bronchial stenosis, but it cannot be used in the complete occluded bronchus.

Electrocautery was used to rebuild the cannel. Distorted by the atelectasis, the location and direction of the bronchus was changed. Perforation is at high risk. So electrocautery must be used with caution.

Cryotherapy is a safe procedure. Since cartilage is resisted to cryotherapy, no perforation occurred. Although cryorecanalization has been reported to immediate management of acute airway obstruction with granulation

or neoplasms, it is useless in fibrotic occlusion of the bronchus cause by tuberculosis. We find cryotherapy with freeze-thaw cycles can reopen the occluded bronchus with delayed effect.

Methods
Patients with fibrotic occluded main bronchus (had no visible lumen and could not passed by guide wire) underwent bronchoscopy under general anesthesia. Cryotherapy was used with freeze-thaw (Freeze 30 second and thaw naturally) cycles at the possible orifice. 3 cycles at each location. There was no obvious change right after the cryotherapy. The following bronchoscopy was made at about 1 week later. Cryotherapy repeated until guide wire could pass through the bronchus and balloon dilation could be done. Or the doctor or the patient decided to stop the procedure.

Results
9 patients with main bronchus occlusion (2 right main bronchus and 7 left main bronchus) underwent cryotherapy during 2008 ~ 2017. Seven patients out of them got reopening of the fibrotic occluded main bronchus successfully. The patients are all female, aged 21~49 years. They all had 1-10 years of tuberculosis history and finished more than 6 months of chemotherapy. The exact time of bronchus occlusion was difficult to track. 6 out of 7 reopened patients underwent 1-2 times of cryotherapy course to rebuild the main bronchus. Only 1 patient underwent 7 procedures before balloon dilation can be done. 2 failed patients underwent 3 times of the cryotherapy. One of them had got failed electrocautery and mediastinal emphysema before, and the failed operation might stimulate the proliferation of scar and related to the failure of cryotherapy. No procedure related complication was recorded.

Conclusions
Cryotherapy with freeze-thaw cycles can be used to reopen fibrotic occlusion of bronchus following tuberculosis and make it suitable for balloon dilation. It is safe and effective.

Uploaded File(s)

Powerpoint Upload

Recanalization of the fibrotic occluded bronchus caused by.pptx

(135) Submission ID#407542

Review of a 10-year Experience of Rigid Bronchoscopy at a Tertiary Centre in Singapore

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Akash Verma – Tan Tock Sneg Hospital, Singapore

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Flexible bronchoscope has increased the applications of bronchoscopy. However, select group of patients still require rigid bronchoscopy (RB), which is the technique of choice for the management of complex airway disorders. We conducted this study to report our experience with RB to evaluate its clinical utility, benefit and safety.

Methods
This is a retrospective review of medical records of patients undergoing RB between November 2007 and October 2017 at a tertiary centre.

Results
One hundred and seventeen patients underwent 180 RB for benign (n=36) and malignant lesions (n=81) employing various techniques such as Nd:YAG laser, stent placement, balloon dilatation, and electrocautery. Median (range) survival in whole cohort was 10.1 (0.1 to 286) months, with significantly longer survival in the benign group 22.7 (0.1 to 286) vs. malignant 7.7 (0.3 to 172.7) group (p=0.02). Patients with malignancy in the lobar bronchi, had a longer survival compared to those in trachea and main bronchi (20.5 vs. 6.2 months, p=0.01). Of the 21 (17.9%) patients requiring assisted mechanical ventilation for respiratory failure at the time of intervention, 12 (57%) were successfully extubated after intervention within the median interval of 3 days, with post-intervention intensive care unit (ICU) length of stay shorter than the total ICU length of stay (3 vs. 11.5 days, p=0.008). Procedural complications occurred in 27 (23%) of patients, mostly in the malignant group compared with benign group, 23 (19.6%) vs. 4 (3.4%), p=0.02, with 16 (60%) requiring escalation of level of care. There was no peri-procedural death; however 11 (9.4%) patients died within 30 days of intervention from underlying malignant disease.

Conclusions
RB was an effective, safe and resource sparing procedure. The commonest indication was malignancy. Intervention on lobar bronchi correlated with longer survival. Significant reduction in ICU length of stay in those requiring assisted mechanical ventilation was seen post RB. No peri-procedural death and very low rate of complication were observed.

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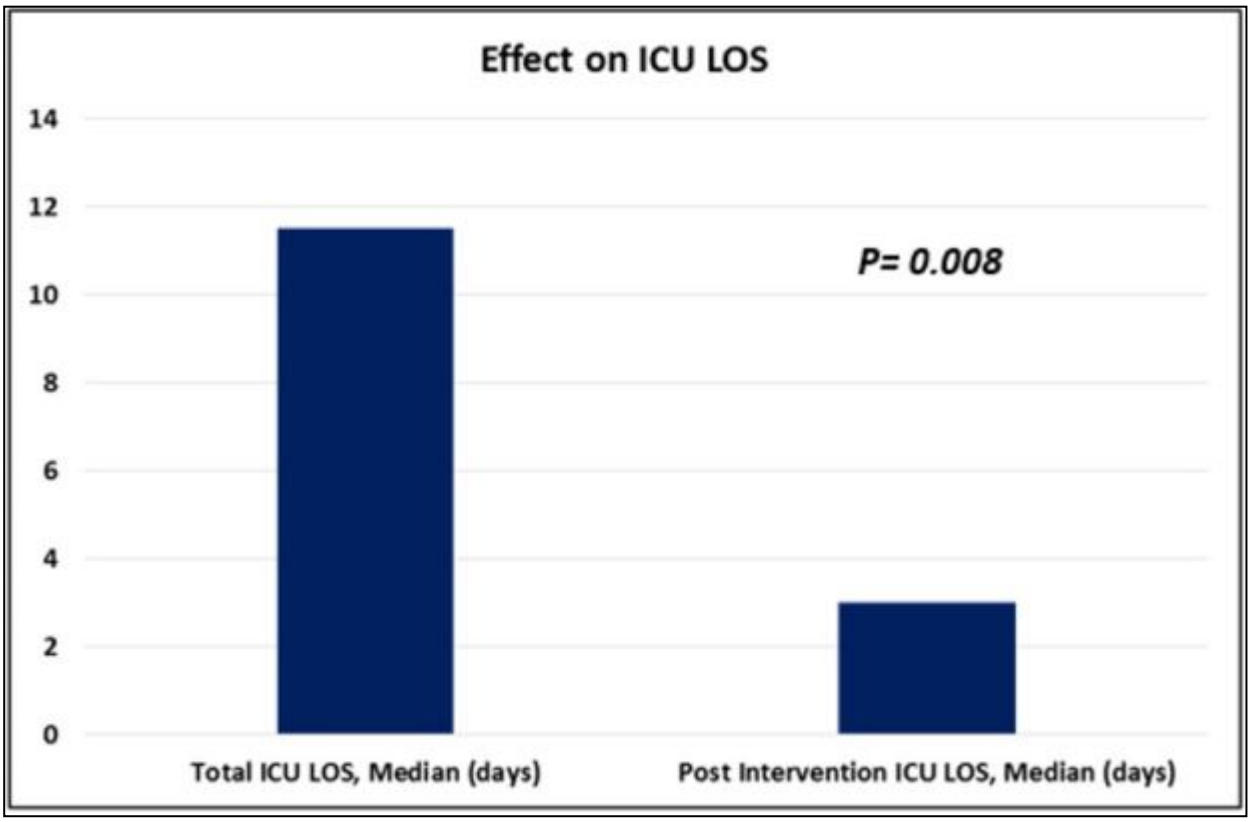

(136) Submission ID#456740

Rigid bronchoscopic intervention to treat adenoid cystic carcinoma

Submission Type: Oral and Poster

Submission Status: Complete

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Adenoid cystic carcinomas are rare; most occur in the trachea or main bronchus, sometimes causing central airway obstruction with severe dyspnea, thus reducing performance status.

Methods
Patients with adenoid cystic carcinomas who underwent rigid bronchoscopic interventions at Nagoya Medical Center from July 2005 to July 2017 were retrospectively enrolled. All procedures were performed under general anesthesia.

Results
Thirteen patients (four males; median age, 62.5 years [range, 3381 years]) were eligible for analysis. The tumors invaded the trachea in nine patients, the trachea and right main bronchus in one, the main carina and bilateral main bronchus in one, the main carina and right main bronchus in one, and the right main bronchus in one. The median procedural time was 70 min (range, 25239 min). All patients who needed oxygen therapy prior to treatment became free of that need after treatment. Nine patients (69%) received additional treatments

after the bronchoscopic interventions: radiotherapy in six, surgical resection in two, and surgical resection followed by radiotherapy in one. A total of five complications occurred in four patients: granulation tissue formation in two, stent migration in one, vocal cord edema after rigid bronchoscope removal in one, and hemorrhage in one. The median follow-up time was 920 days (range, 1203,041 days). Ten patients were alive at the time of data collection.

Conclusions

Rigid bronchoscopic interventions play important roles in improving respiratory symptoms as well as bridging to additional tumor-specific treatments in patients with adenoid cystic carcinomas.

(137) Submission ID#450292

Safety and effectiveness of cryo recanalization in benign and malignant endobronchial lesions

Submission Type: Oral and Poster
Submission Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Endobronchial lesions can be symptomatic and are needed to be removed for symptom relief or therapeutic

reasons. Cryoprobe recanalization provides immediate airway passage leading to improvement of symptoms. Here we present effectiveness and safety of recanalization with cryoprobe and argon plasma coagulation (APC) or electrocautery in patients with airway lesions.

Methods

Cryoprobe (1.9 mm or 2.4 mm, ERBE, Germany) recanalization technique with APC or electrocautery is used for debulking of endobronchial benign or malignant lesions causing airway obstruction. Mechanical extraction of lesion with cryoprobe was performed after the probe placed in the center of the tumor or granulation tissue, and froze for 4 to 20 second while watching the ice ball formation away from the airway wall. Hemostasis was achieved with APC (ERBE, Germany) or electrocautery (Gold probe, Boston Scientific, USA). All procedures were done under general anesthesia and most with endotracheal tube.

Results

We used cryoprobe recanalization as debulking method in 94 patients (43 women, 51 men) with malignant or benign endobronchial lesions (Table). All patients were presented with symptoms of respiratory distress (n=80), post obstructive pneumonia (n=15), respiratory failure requiring mechanical ventilation (n=4) and loss of voice (patients with tracheostomy and granulation tissue formation, n=4). Endobronchial lesions were; trachea 15, main stem bronchi 35 and the rest (n=44) at the bronchus intermedius or lobar level. Majority had airway obstruction 60%-100%. 21 patients required stent placement post debulking due to mixed endobronchial lesion. While malignant endobronchial lesions needed hemostasis with either APC or electrocautery, only half of the benign lesions required hemostasis. Airway patency (>80%) was achieved in more than 90% of patients (Picture). All procedures were done under general anesthesia with endotracheal tube except for 3 cases whom rigid bronchoscope was needed due to bleeding. 7 patients experienced 10-80 cc of bleeding.

Conclusions

Cryoprobe recanalization easy, safe and effective method for debulking benign or malignant endobronchial lesions. Rigid bronchoscopy is not needed in most cases. Hemostasis, argon plasma coagulation or electrocautery, was needed in all malignant but only half of the benign lesions.

Uploaded File(s)

Image or Table

Picture 1. Left; left upper lobe carcinoid tumor, Middle; cryoprobe and APC debulking, Right; 3 months follow up

Powerpoint Upload

Cryo Recanalization at WCBIP.pptx

(138) Submission ID#471560

Safety and efficiency of physician-directed conscious sedation with propofol during EBUS bronchoscopy

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Danai Khemasuwan – St. Elizabeth Medical Center

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Interventional Pulmonology

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- Yes

Background

Propofol use for moderate sedation (MS) during endobronchial ultrasound bronchoscopy (EBUS) is primarily restricted to be used under presence of anesthesiologist or Certified Registered Nurse Anesthetists due to safety concerns. However, the use of propofol sedation for EBUS by Interventional pulmonologist (IP) and trained endoscopy nurses is not prohibited in several states in the US. The goals of this study were to demonstrate the safety and the efficiency of propofol use for conscious sedation during EBUS bronchoscopy without intubation.

Methods
We tested a bolus propofol administration protocol targeting moderate sedation for EBUS bronchoscopy. A fixed initial bolus dose of 40 mg along with a fixed 50 mcg fentanyl bolus were administered. Sedation assessment were performed every 2 minutes. The following bolus doses were administered per protocol by a nurse under the instruction of bronchoscopist to maintain moderate sedation.

Results
A total of 122 patients underwent EBUS bronchoscopy from August 2015 to April 2017. In total, 110 patients underwent convex EBUS bronchoscopy under moderate sedation with propofol without intubation were included into the analysis. Median procedure duration was 56 minutes (range, 15 to 97 minutes). Deep sedation and agitation-related delay were occurred in 14 and 21 subjects, respectively. Hemodynamic instability and hypoxemia occurred in 23 patients. However, there was no need for vasopressors or artificial airway placement. Median of total propofol dose per case was 560 mg. Mean propofol dose per case was 0.13 mg/kg/min. Diagnostic yield for malignancy and granuloma was 68% and median of 4 lymph node stations aspiration per patients. Systemic staging was performed in 28 patients. All tumor specimens sent for genetic study were sufficient for analysis (20 patients). Flow cytometry was analyzed in 36 patients. There were no major sedation-related complications.

Conclusions
A bolus administration of propofol during EBUS bronchoscopy provided excellent adequacy of sedation and well tolerance safety profile.

(139) Submission ID#473618

Safety of percutaneous dilatational tracheostomy in patients with hematologic malignancy

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Jongyeol Oh – The Catholic University of Korea, Bucheon ST. Marys Hospital

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
In patients with hematologic malignancies, acute respiratory failure requiring mechanical ventilation is a severe and frequent complication. Recent have shown that the outcome of mechanically ventilated patients with hematologic malignancies over the last decade. This study conducted to clarify if percutaneous dilatational tracheostomy (PDT) is safe in this group of patients and to report the outcome of patients with hematologic malignancies requiring long-term mechanical ventilation.

Methods
To evaluate the safety of PDT in patients with hematologic malignancies, we retrospectively analyzed the clinical characteristics of patients who underwent PDT in medical ICU from January 2012 to January 2017.

Results
PDT was safely performed in all 55 patients. Although 5 (9.1 %) patients developed major bleeding that required electric coagulation, fatal complications were not observed. Of the 55 patients in this study, 21 (38.2 %) could be weaned from ventilator, and 19 (34.6%) survived the intensive care unit stay. There were no differences in the demographics, laboratory findings between patients with bleeding complication and those with none. Bleeding complications were significantly fewer in patients with history of hematopoietic stem cell transplantation (p = 0.032).

Conclusions
PDT can be safely performed on patients with hematologic malignancies. The procedure did not result fatal complications in this study.

(140) Submission ID#454908

Safety profile for interventional bronchoscopy with fiberoptic bronchoscopy

Submission Type: Poster Session ONLY

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Flexible bronchoscopy (FOB) solely for performing interventional procedures is used sparingly around the world. The intention of this single center retrospective study is to share our experiences with interventional procedures, its safety profile and feasibility when performed with FOB under monitored anesthesia care.

Methods
Retrospective data from 91 cases performed at our institution from 2015 to 2017 were identified. Most cases were performed at the bronchoscopy suite with proximity to the operating suite. An experienced thoracic surgeon and an assisting pulmonologist performed cases with varying spectrum of airway interventions. Procedures were performed under moderate sedation (MS), monitored anesthesia care (MAC) or general anesthesia (GA) using either FOB or rigid laryngoscopes or bronchoscopes. Significant hypoxemia was defined as 10% decrease of pulse oximetry from baseline saturation prior to start of procedure. Procedural variables causing significant hypoxemia were scrutinized. Secondary outcomes such as symptom relief, luminal patency relative to the initial degree of airway obstruction attained, escalation of care and complications encountered were also examined. Statistical analysis when pertinent with Fisher exact test, Chi square test and univariate analysis for variables were studied for any statistically significant p values of < 0.05.

Results
12(13%) cases had complications, with escalation of care in 9(10%) of them. 28(30%) had significant hypoxemia during the procedure. Mean endoluminal obstruction was 94+/-24. Mean luminal patency achieved was 76 +/- 20. Symptom relief occurred in 73(80%) cases with subsequent radiology improvements in 70(77%). Ablative therapy (NdYAG, APC) 59(65%), Balloon dilatation 38(42%), and Stents in 38(42%) cases were done respectively.

85(93%) cases had procedures done through a FOB over 6(7%) with rigid instruments with no significant hypoxemia ($p=0.73$). Hypoxemia risk was not statistically significant between MS, GA or MAC ($p = 0.59$). No statistically significant hypoxemia was detected with the site of the lesion, ASA, urgency of procedure when being performed, repeat of procedures and routes of access to the airway (nares vs oral vs endotracheal tube). However,thermal ablative modalities resulted in hypoxemia 35(38%) ($p=0.018$). No statistically significant hypoxemia was noted in cases with balloon dilation or stents insertions.

Conclusions
In our experience, interventional bronchoscopy performed by FOB can be performed under MS, MAC or GA in a relatively safe manner, without significant hypoxia. With an experienced operator; it achieves comparable palliation of symptoms, in comparison to cases performed with a rigid instrument. Hypoxemia can occur briefly with thermal ablative therapies possibly because of low concentrations of oxygen required for perform it.

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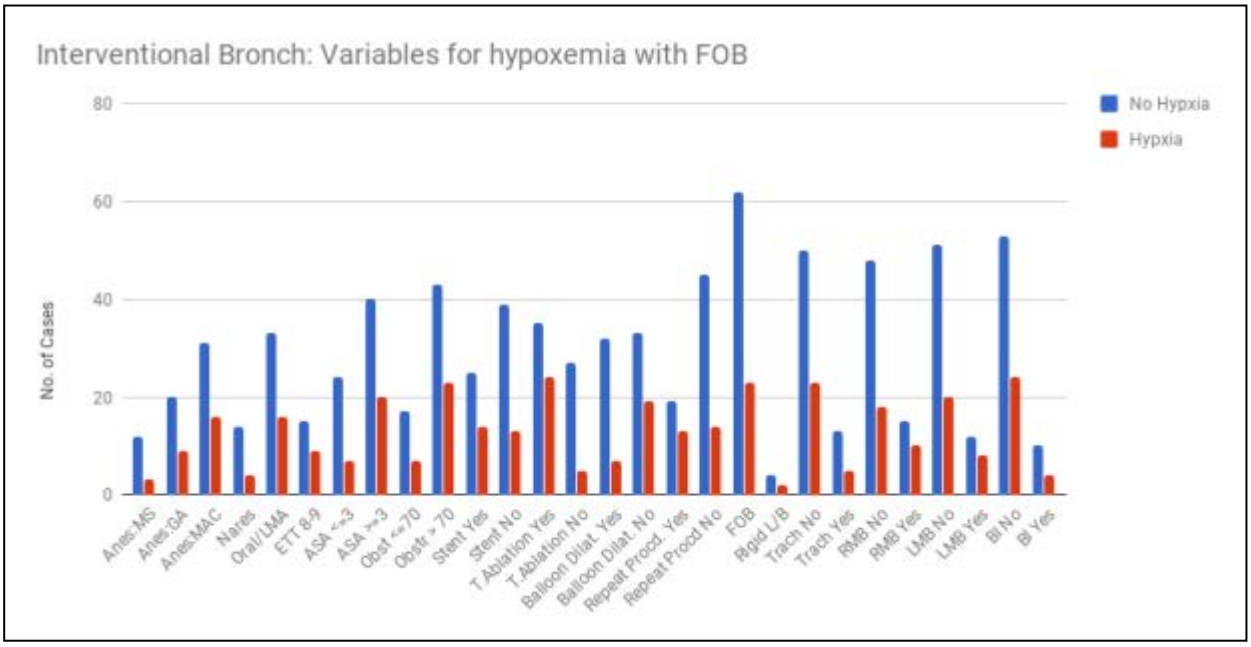
Image or Table


Interventional Bronch: Variables for hypoxemia with FOB
No Hypxia
Hypxia
No. of Cases
80
60
40
20
0
Anes:MS
Anes:GA
Anes:MAC
Nares
Oral/LMA
ETT 8-9
ASA <=3
ASA >=3
Obst <=70
Obstr > 70
Stent Yes
Stent No
T.Ablation Yes
T.Ablation No
Balloon Dilat. Yes
Balloon Dilat. No
Repeat Procd. Yes
Repeat Procd No
FOB
Rigid L/B
Trach No
Trach Yes
RMB No
RMB Yes
LMB No
LMB Yes
BI No
BI Yes

(141) Submission ID#477962

Setting up a tumor board. How do others do it? A comprehensive plan for an Interventional Pulmonologist' success

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Gustavo Cumbo-nacheli – Spectrum Health Medical Group

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No financial relationships or conflicts of interest.

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Interventional Pulmonology

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Background

Many hospital systems do not have a tumor board or an interventional Pulmonologist, relying solely on a single practitioners criteria to address specific and often challenging needs. We will overview different strategies to set up tumor boards across different platforms and hospital system needs, with a strong Interventional Pulmonology role in patient selection, workup and treatment.

Methods

Retrospective chart review comparing workup, treatment plans, outcomes in a multidisciplinary tumor board prior and after interventional pulmonology presence.

Results

We will describe how to set up a tumor board group to discuss challenging cases in suspected lung cancer and central airway obstruction.

Discussions regarding establishing roles, workflow and plans execution spearheaded by IP.

Enhancement of sub specialist involvement and growth strategies. Role of visual consultation.

Conclusions

A strong interventional Pulmonology presence will enhance patient care in a multidisciplinary tumor board, improving outcomes and expediting workup.

(142) Submission ID#459214

Short term use of non-covered self-expanding metallic stent in treatment of bronchomediastinal fistula caused by invasive pulmonary mucormycosis.

Submission Type: Case Report
Submission Status: Complete
Submitter: Hanine Inaty – Cleveland Clinic

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Self expanding non covered metallic stents (SEMS) are known to be associated with significant granulation tissue formation, thus they have been successfully used to facilitate healing of post-lung transplant airway dehiscence. Their use in the setting of airway obstruction and bronchomediastinal fistula caused by invasive pulmonary mucormycosis have not been previously described. Herein, we present the first reported case in literature.

Case Report

Our patient is a 65 year old female, recently diagnosed with acute myelogenous leukemia treated with induction chemotherapy, presented to the hospital with symptoms of shortness of breath and fever. Her chest computed tomography revealed significant right upper lobe consolidative infiltrates, and a perihilar lesion

invading the right main stem bronchus (RMSB) and bronchus intermedius (BI) causing a bronchomediastinal fistula. Bronchoscopy showed a large necrotic endobronchial mass eroding through the posterior membrane of RMS and BI with near complete occlusion of airway lumen. Distal airways as well as right upper lobe (RUL) bronchus were however patent. Debulking of the lesion was performed using forceps and electrocautery snare with improvement in airway lumen. A 12 x 40 mm non-covered SEMS was placed in the BI and RMSB over a guidewire. The stent helped push residual lesion away and cover the associated fistula. At the same time, It allowed for an unobstructed ventilation and drainage of the RUL through the interstices of the stent. (fig 1A) Pathology of the endobronchial lesion revealed necrotizing angioinvasive fungal infection of the species Rhizomucor pusillus. Patients symptoms significantly improved following procedure. She was treated with IV Micafungin followed by a prolonged course of oral Isavuconazole. Follow-up bronchoscopy a month later showed significant ingrowth of granulation tissue around the stent. The stent was successfully removed and airways appeared patent with healed fistula. Repeat imaging showed no endobronchial disease and near complete resolution of right perihilar consolidation and RUL infiltrates. (Fig1B)

Conclusion

We describe a rare case of invasive mucormucosis causing airway obstruction and bronchomediastinal fistula, successfully treated with temporary placement of an uncovered SEMS, likely though promoting excessive granulation tissue formation through the interstices of the stent and providing a platform for healing of airway defect. Only short term use is advised given difficulty and risk of removal following epithelialization.

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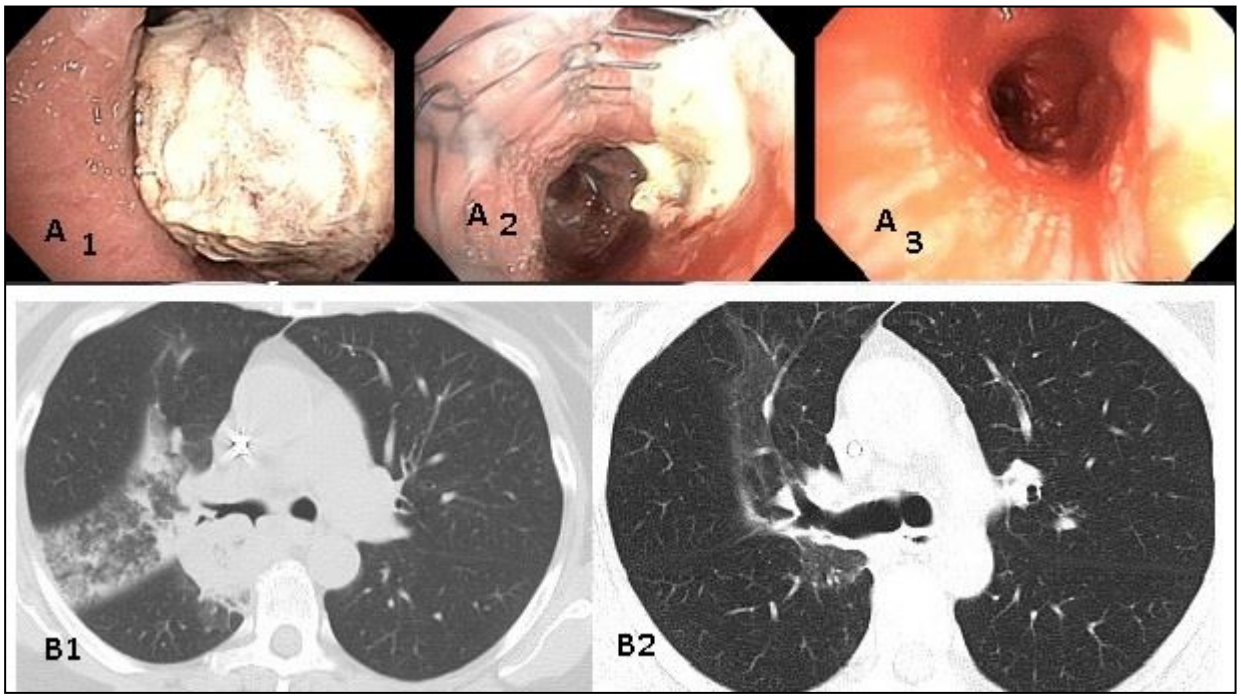

(143) Submission ID#458964

Significances of spirometry and impulse oscillometry for detecting small airway disorders assessed with endobronchial optical coherence tomography in COPD

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Zhuquan Su – The First Affiliated Hospital of Guangzhou Medical University

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Spirometry confers limited value for identifying small-airway disorders (SADs) in early-stage COPD, which can be detected with impulse oscillometry (IOS) and endobronchial optical coherence tomography (EB-OCT). Whether IOS is useful for reflecting small-airway morphological abnormalities in COPD remains unclear. We aimed to compare the usefulness of spirometry and IOS for identifying SADs in heavy-smokers and COPD based on EB-OCT.

Methods

We recruited 59 COPD patients (stage I, n=17; stage II, n=18; stage III-IV, n=24), 26 heavy-smokers and 21 never-smokers. The EB-OCT probe with the probes outer diameter of 0.9 mm was inserted into an ultrafine flexible bronchocopy under computerized navigation system. Patients withheld their breath following full inspiration. EB-OCT parameters included mean luminal diameter (Dmean), inner airway area (Ai) and airway wall area (Aw) from the 7th to 9th generation of the right lower lobe bronchus (RB9) segment.Assessments of clinical characteristics, spirometry, IOS and EB-OCT were performed.

Results
More advanced staging of COPD was associated with greater abnormality of IOS and spirometric parameters. Fres and R5-R20 had greater diagnostic values than FEV1% and MMEF% predicted in discriminating SADs in never-smokers and heavy-smokers (AUC: 0.771 and 0.753 v.s. 0.570 and 0.558, respectively), as well as in heavy-smokers and stage I COPD (AUC: 0.726 and 0.633 v.s. 0.548 and 0.567, respectively). The combination of IOS small-airway parameters (Fres and R5-R20) and spirometric (FEV1% and MMEF% predicted) parameters contributed to further increase in the diagnostic value for identifying SADs in early-stage COPD. EB-OCT parameters small airway wall area percentage (Aw%7-9) correlated significantly with Fres and R5-R20 in COPD and heavy-smokers (all $P<0.05$), whereas EB-OCT parameters correlated with FEV1% and MMEF% in advanced (all $P<0.05$), rather than early-stage (all $P>0.05$), COPD.

Conclusions
IOS parameters correlated with morphologic abnormalities of small airways assessed with EB-OCT in COPD and heavy-smokers. Fres and R5-R20 might be sensitive parameters that reliably reflect SADs in heavy-smokers and early-stage COPD.

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Significances of spirometry and IOS for detecting small airway disorders assessed with EB-OCT in COPD.pptx

(144) Submission ID#458875

Stent-in-stent method for 'jailed' airways

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Sonali Sethi – Cleveland Clinic

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Multiple stents may be needed to maintain airway patency however it is difficult to interlay one stent within another (stent-in-stent) secondary to the inability to make a side hole for a jailed airway. There is a small polytetrafluoroethylene covered stainless steel balloon deployed stent (iCast) which ranges from 5-10x16-59 mm. This stent can easily be deployed through a flexible bronchoscope under direct visualization and can easily be punctured for a jailed airway. Our objective was to assess the feasibility of puncturing a hole and interlaying stents within each other to completely reform an airway involving multiple airway segments.

Methods

Bronchoscopy records of patients who had the placement of an Atrium iCast stent using the stent-in-stent method with a jailed airway were reviewed over 4 years.

Results

A total of 37 iCast stents were deployed in 9 patients with central and distal bronchial stenosis. The average age was 61 years with 1 female and 8 males. The etiology of DBS included 1 secondary to malignant disease following XRT, and 8 lung transplant airway complications. The stent-in-stent method ranged from 2-4 stents being used to reconstruct the airway. A hole in the iCast stent was made with a TBNA needle followed by forceps or curette, and then balloon dilation. The majority of stents were placed in the RLL extending into the BI(30%), followed by holes made for the the RML(28%), RLL superior subsegment(16%), RLL(5%), and RUL(5%). On the left stents were placed with holes for the LUL(8%), LLL(5%), and lingula(3%). One patient had full stent airway reconstruction 4 times over the course of 3.5 years, and one patient 2 times over the course of 1.2 years. The most common stent size deployed was 7x22mm(30%), followed by 7x16mm(28%), 8x38mm(19%), 10x38mm(10%), 6x16mm(8%), and 6x22mm(5%). There was an average of 1 bronchoscopy procedure per month for stent maintenance. Three patients died from non-stent related complications. Common complications included granulation tissue and mucous plugging. Eight patients were given stent free holidays. Three patients had their stents completely removed after achieving permanent airway patency.

Conclusions

Airway stents are commonly only deployed in central airways to reestablish luminal patency. However, distal bronchial stenosis is feasible and may improve quality of life and should become a new common practice. In addition, the iCast stent can be used in both central and lobar bronchial stenosis by making a side hole for jailed airways and interlaying using a stent-in-stent method.

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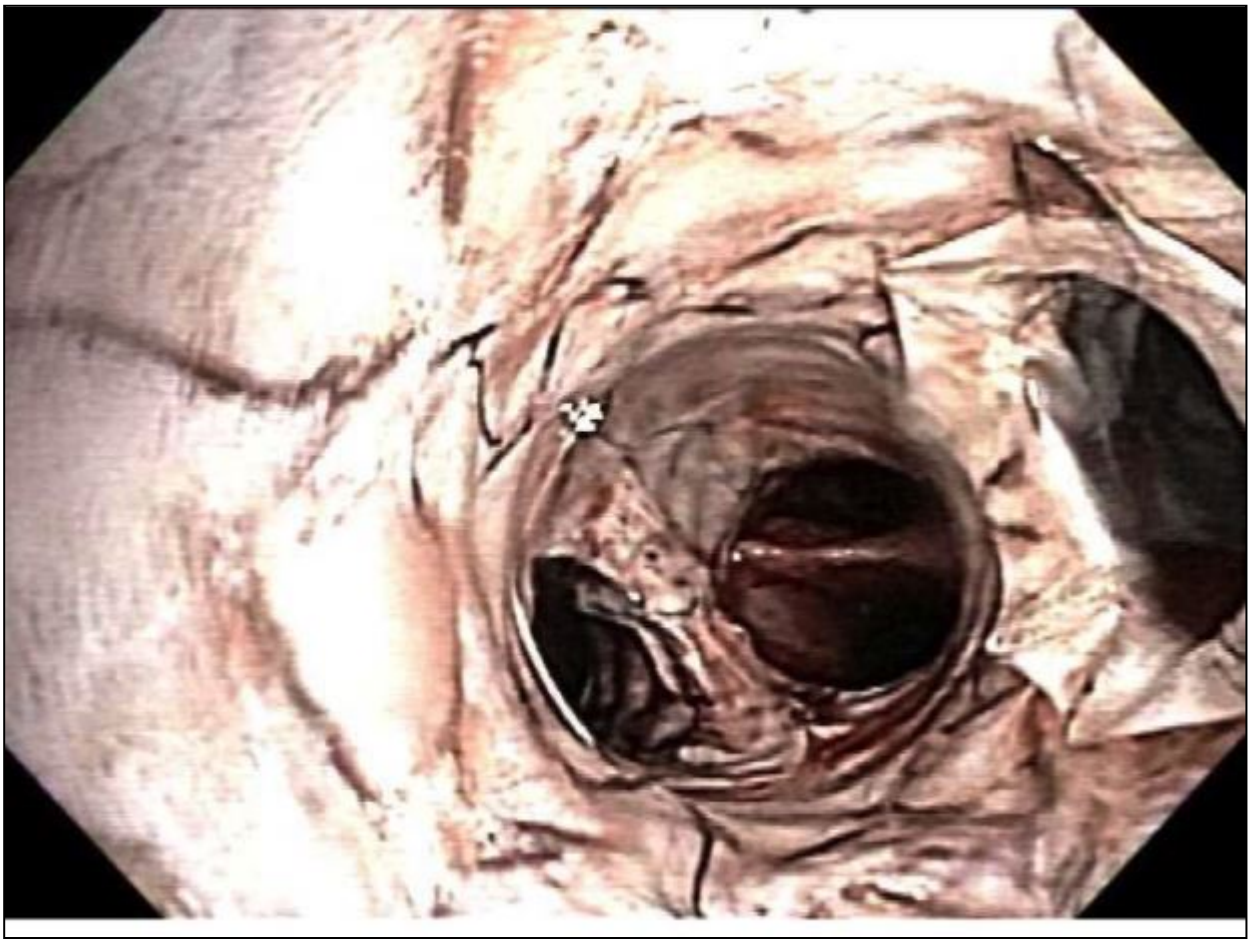

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stent-in-stent.pptx

(145) Submission ID#459659

String Tied Method---A Novel Method for Silicone Stenting

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Shi-Yue Li – National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Disease, First Affiliated Hospital of Guangzhou Medical University, Guangzhou, Guangdong, China

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
The deployment of a silicone stent typically requires a specialized stent applicator system including a folding system and an introducer, however, it is generally restricted by the small OD of an introducer tube to fit the applicator. Therefore, the reasons, such as a small angle between the trachea and the primary bronchus, the narrow airway for rigid bronchoscope insertion, are usually deemed inoperable for deployments of a silicone stent. To solve this problem, we developed a novel method to deploy a silicone stent wrapped with strings, based on Ultraflex Stent Tracheobronchial Stent System. Here we present three cases of successful placements in the airway stenosis.

Methods
Case 1: A 26-year-old man with history of cicatricial stenosis of right main bronchus was inoperable to deploy a silicone stent (OD 10mm) due to the narrow airway for insertion the 12mm OD introducer tube after failure of multiple bronchoscopic interventions with balloon dilation and laser incision. The silicone stent wrapped with string tied was successfully deployed (OD 6mm after constrained). Case 2: A 53-year-old man suffered from severe tracheobronchial stenosis after extensive airway burned, and needed a silicone Y stent deployment. Only the introducer tube with an OD of 12mm is available due to his severe stenosis, but the inner channel is impracticable to a Y-stent, likewise, we successful deployed the Y-stent (unconstrained OD14-10-10mm, constrained OD 8mm) with the new method. Case 3: A 35-year-old man suffered from left main bronchus stenosis after tracheobronchial tuberculosis , and the insertion of rigid bronchoscope was confined to the opening of left main bronchus due to a small angle(97°) between the trachea and the left main bronchus. Similarly, a silicon stent of diameter 12mm was available to deploy with this method.

Results

No complications were found in these 3 procedures.Wrapped with string tied , the constrained silicone stent had a smaller OD than that was done by Novatech Stent Applicator System, less than 3 to 4 mm. Meanwhile, the flexibility of the delivery catheter and the design of a comicalness tip enhance the ease during the navigation through the airway.

Conclusions

When an insertion of rigid bronchoscope is restricted by a small angle between the trachea and the primary bronchus, or the conventional deployment of silicone stent is limited by the small OD of introducer tube for rigid bronchoscopy, the deployment of silicone stents wrapped with string tied is a feasible and safe solution.

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(146) Submission ID#457768

Stuck LED Bulb from sub segmental bronchus

Submission Type: Case Report

Submission Status: Complete

Submitter: S Santhakumar – Kovai Medical Center&Hospital, Coimbatore

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

Retrieval of airway foreign bodies can become very difficult at times depending on the location, size and position of the foreign body. We report a case of successful recovery of a difficult foreign body in a child, where an LED bulb of a toy, stuck in a sub segmental bronchus of right lower lobe bronchus and saved the

patient from right lower lobectomy.

Case Report

A five years old boy was referred for right lower lobectomy to our centre because of two failed attempts with rigid and flexible bronchoscopy elsewhere. It was a LED bulb of an electronic toy aspirated 3 days back. Child had cough, and chest pain with breathing difficulty. It was reported that the bulb is stuck in to right lower lobe bronchus and attempted pulling could result in bronchial tear and hence he was referred for lower lobectomy. In our place we located the foreign body in the medial basal segment of right lower lobe and it was stuck due to its reverse position and any proximal pull was not possible due to its pin impinged to bronchial wall. We tried to dilate the bronchus by vascular balloon through ultrathin flexible bronchoscope which was introduced through a 4.5 sized rigid barrel which was held at right lower lobe bronchus and rotated the foreign body. As further attempts failed to mobilize it proximally, both the pins were broken down and removed separately. The bulb on was mobilized proximally by vascular balloon placed distal to the foreign body and inflated. While the foreign body was withdrawn in to the lobar bronchus, it was grabbed by rigid forceps and brought in to the rigid barrel and removed along with it. Child was saved from thoracotomy.

Conclusion

To our knowledge this kind of unusual foreign bodies located deep in the sub segmental bronchus in abnormal position is rarely reported in literature. Innovative thinking and operator skills, play important role in handling these situations.

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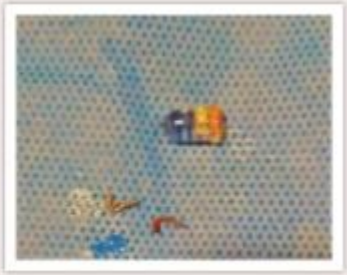
Foriegn body deep in segmental bronchus

After retrieval of foreign body

Impacted foreign body

After fuse pins are broken



Retrieved foreign body in 3 pieces

(147) Submission ID#459340

Successful management of endobronchial metastases using electrocautery snare and laser photocoagulation

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Mihovil Roglic – University Hospital Center Zagreb, Department for Pulmonary Diseases

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Interventional Pulmonology

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Background
Extrathoracic malignancies can metastase endobronchialy, within a bronchoscopically visible range. Although clinical and radiological presentation can be similar to a primary lung cancer, treatment and prognosis may be different. Surgical procedure is recommended but exposing patients to metastasectomy carries a high risk of perioperative complications. The aim of our work was to present cases where interventional bronchoscopy procedures were used as a treatment option for metastases of different extrathoracic malignancies.

Methods
Retrospective analysis of our patient records and bronchoscopy charts revealed 46 procedures performed in 27 patients with endobronchial metastases of different extrathoracic malignancies during the 6 year period. We have collected data on baseline characteristics, histopathological results, treatment modalities, and survival time. A rigid and flexible bronchoscopy was performed by a pulmonologist under sedation, local or general anesthesia for each patient.

Results
The mean (SD) age of our patients was 61.6 (13.4) years with only minority being female (25.9%). In some cases more than one and up to 7 interventional procedures were done in the same patient with success rate of 47.8%. The most prevalent were metastases of kidney cancer (37%), followed by colon, ovarian, melanoma and rectum. The most frequently used techniques were electrocautery snare (60.9%) and laser photocoagulation (60.9%). We found a statistically significant difference in the success of interventions depending on the type of tumor (p=0.010), with the higher rates of success in the metastases of cervix, colon, rectum and ovarian tumors (60%). Serious bleeding occurred most often in hepatocellular (100%), kidney (38.1%) and rectum (20%) cancer metastases. Contrary to our expectations the age was the only significant factor predicting success with each year contributing the odds with 8% (OR 1.08, 95% CI 1.01-1.16, p=0.04).

Conclusions
Interventional bronchoscopy proved to be successful in management of endobronchial extrathoracic tumors that have spread to lungs, although more in some types of tumor than in others. The major complication limiting the success of the procedure was bleeding. Even so interventional bronchoscopy is effective, less invasive and more cost and time effective than surgery.

(148) Submission ID#455400

Successful recanalization of a right mainstem stenosis with two balloon expandable stents using an in-stent bifurcating approach in two lung transplant patients.

Submission Type: Poster Session ONLY
Submission Status: Complete
Submitter: Erhan Dincer – University of Minnesota

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

up to 18% of lung transplant patient can develop anastomotic airway complication which continues to be a significant cause for poor clinical outcomes. Stenting of the airway is often a common approach; however, the ideal stent has yet to be developed. We present two lung transplant patients with a stenotic right mainstem anastomosis who underwent stent placement with two balloon expandable stents using an in-stent bifurcating approach.

Methods
Patient 1. A 61-year-old man with single right lung transplant developed near complete occlusion of anastomosis requiring multiple balloon dilations. The complex anatomy including tortuous, short and broad right mainstem and immediate take-off to the RUL made placing either a silicone or self-expandable stent difficult. Therefore, an 8x38mm balloon expandable stent was deployed in to the right main stem then a 7x16mm balloon expandable stent advanced through the this stent in to the RUL bronchus.

Patient 2. A 72-year old man with history of a single right lung transplant presented with anastomotic dehiscence secondary to fungal infection resulting in a chronic anastomotic stenosis that had been treated with serial airway balloon dilations. Under direct visualization, the RM anastomosis was near complete occlusion. Despite serial airway dilation, the RM anastomosis remained greater than 90% occluded and the decision was made to place a stent. As the technique described above, we deployed a 10X38mm and 7X16mm iCast stents into the right main stem and the RUL, respectively.

Results
Patient 1. A 6-week follow-up surveillance bronchoscopy demonstrated no migration and intact stents in both cases.

Conclusions
Although the ideal stent has yet to be developed, airway stents are commonly used to reestablish airway patency especially in patients with lung transplantation. The attraction lies within its ease of deployment, increased flexibility and greater radial strength. Recent literature has shown successful use of this stent for small airway and lobar salvage in both malignant disease and lung transplant patients); however, our two cases demonstrate its versatility in the mainstem airway as well. We attest that this approach was safe and effective, which allowed us to achieve an immediate and successful result.

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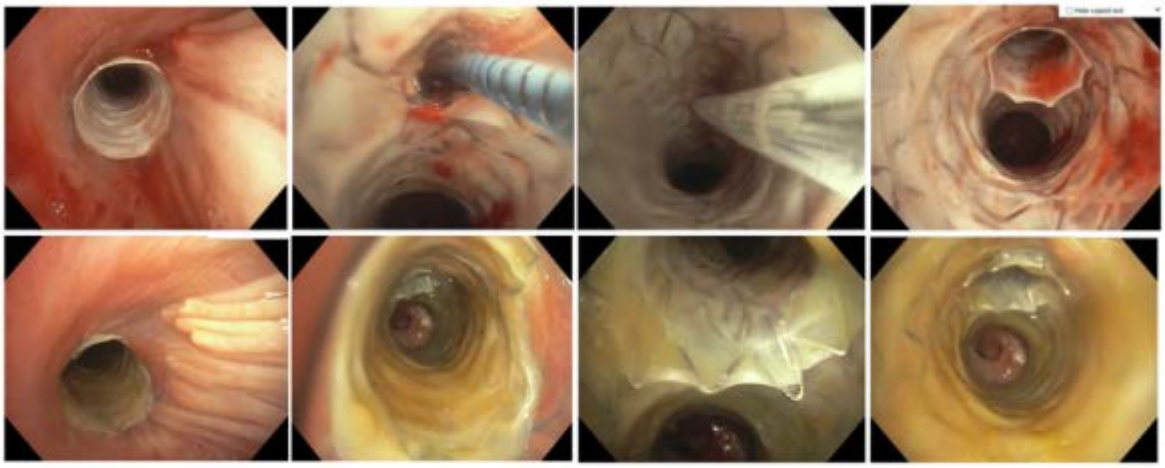

Figure 1. Bronchoscopic images of the RM anastomotic stenosis and interval placement of two bifurcating iCAST stents. Top row demonstrates the initial placement of a right mainstem to upper lobe bifurcating iCAST stents. Bottom row demonstrates a 6 week followup surveillance bronchoscopy.

(149) Submission ID#455151

Successful retrieval of a plastic bead from the airway of a child by flexible bronchoscopy and a balloon: a case report

Submission Type: Case Report
Submission Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Bronchial foreign body aspiration is a critical condition that jeopardizesthe respiratory function of children.Prompt diagnosis and removal of the foreign body can reduce the occurrence of foreign body complications and mortality. Aspiration of spherical plastic beads is rare, and the bead is difficult to retrieve.

Case Report
we report a case in an 8-year old girl who accidentally inhaled a plastic bead seven hours ago. She had cough, transient throat wheezing and intermittent cough. Examination at admission showed that the child was in a general good condition. Emergency bronchoscopy was carried out upon admission, and the child

underwent rigid bronchoscopy (STORZ) under general anesthesia for retrieval of the foreign body. A blue plastic bead was visualized directly under the rigid bronchoscope and was found to be closely impacted on the opening of the right main bronchus. The bead was 1.0cm in diameter with a central hole 1 mm in diameter, and was not readily mobileand cannot be retrieved by forceps. A fiberoptic bronchoscope (Olympus BFP260, the external diameter 4.0mm) was advanced through the laryngeal mask airway for re-exploration and a balloon-tipped catheter (Lacrosse balloon catheter 4.0 mm x 20 mm) was entered at the same time via the maneuvering channel. The balloon was advanced through the central hole in the plastic bead and released and inflated after passing beyond the hole. The inflated balloon was 4 mm and after it was secured, it was pulled out along with the plastic bead The bead was successfully retrieved by balloon-tipped catheter via flexible bronchoscopy.

Conclusion

The finding indicate that flexible bronchoscopy and balloon-tipped catheter retrievalcan be used as an effective non-invasive treatment for aspirated plastic beads.

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(150) Submission ID#458580

Successful treatment of fatal hemorrhage after biopsy by balloon compression under double bronchoscopes: a case report

Submission Type: Case Report
Submission Status: Complete
Submitter: Yuanyuan Li – Department of Respiratory and Critical Care Medicine, Xiangya Hospital, Central South University

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Bronchoscopy is widely used in the diagnosis and treatment of respiratory diseases. Massive hemorrhage, defined as a single bleeding > 100ml, is the most severe complication caused by invasive bronchoscopic procedures, which may cause asphyxia, hemorrhagic shock and even death. In China, approximately 39 per million people are suffered from massive hemorrhage during bronchoscopy, and it causes a mortality of 4.2 per million people. Comprehensive managements for massive hemorrhage during bronchoscopy have been interesting issues for respiratory interventional physician.

Case Report

A 64-year-old male patient was admitted to our department on August 26th, 2014 because of shortness of breath for 5 months. He had a chronic tobacco-use and alcohol-drinking history, and did not take any anticoagulants previously. Physical examination only revealed dull percussion note in right lower lung. Routine blood examination and coagulation function were normal. Chest CT scan showed a lesion of soft-tissue density located in the right pulmonary hilum.

Subsequently, bronchoscopy revealed vascular distension and multiple protuberant nodules in the right main bronchus. After the operator clamped one piece of tissue, massive hemorrhage (about 200 ml) occurred. The patient was asked to lie on his right arm, and intravenous hemostatic agents were immediately injected, after which bleeding stopped. However, massive hemoptysis recurred after 48 hours, even bronchial arterial embolism could not stop it. Therefore, tracheotomy was immediately performed, hemostatic therapies were given under double bronchoscopes. One bronchoscope was transnasal, and mainly focused on aspirating blood and clearing the field of vision. The other bronchoscope placed a dilated balloon through catheter of tracheotomy to compress the right middle bronchus. Meanwhile, hemostatic agents, blood volume expansion and sedative were given. The position of balloon and compressed mucosa were monitored closely. We gradually reduced the pressure of balloon and finally remove the balloon until no bleeding was seen after 82 hours.

Pathological examination showed chronic bronchial mucosa inflammation. The patient was discharged from our hospital after 1 week. So far, he has been routinely followed up. No hemoptysis has been reported, and his pulmonary lesion remains unchanged.

Conclusion

Massive hemorrhage during bronchoscopy is life-threatening, so biopsy under bronchoscope should be cautiously performed if there is any vascular distension in airway. Balloon compression is the most effective mechanical hemostatic method. The application of double bronchoscopes provides a clear field of vision in the bleeding site, which is significantly helpful for subsequent bronchoscopic procedures.

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(151) Submission ID#458326

Swine model of successful sympathetic block via Endobronchial Ultrasound (EBUS) guided transtracheal needle injection of lidocaine

Submission Type: Oral Presentation ONLY
Submission Status: Complete
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Background
Patients with tachyarrhythmias refractory to standard pharmacologic and catheter ablation treatments have limited therapeutic options, and suffer from high morbidity and mortality. Modulation of the autonomic nervous system through sympathectomy is a therapeutic strategy for refractory tachyarrhythmias. Although bilateral cervicothoracic sympathectomy has been demonstrated to benefit selected patients resistant to medical therapy and ablation, it is invasive with variable success rates. We investigate in an animal model using bronchoscopic sympathetic block of the autonomic nervous system.

Methods
We studied 5 domestic Yorkshire pigs, divided into 2 groups (3 animals in the experimental group and 2 animals in the control group). All animals were anesthetized and appropriate vascular accesses established. Two quadripolar diagnostic catheters were positioned into the right and left heart chambers to assess their electrophysiological properties. A 10mm-tip quadripolar catheter was intravascularly positioned adjacent to the right stellate ganglion (RSG) and the left stellate ganglion (LSG) using a transaortic retrograde access. High-voltage stimulations (10-20Hz) were delivered in order to generate a sympathetic response from each ganglion. The RSG sympathetic response was confirmed by 1) QT prolongation, 2) T-wave inversion, 3) increased heart rate and blood pressure and 4) increased right ventricular (RV) contraction pressure (Figure 1a). The LSG response was confirmed by 1) increased rate of LV volume change (dv/dt), 2) peaked T-waves and 3) increased pulmonary arterial pressure (Figure 1c). Endobronchial ultrasound (EBUS) bronchoscope-guided 22 gauge transtracheal needle injections of 1% lidocaine (experimental group) or 0.9% saline (control group) were completed in the para-tracheal regions.

Results
In all five animals, stimulation caused a sympathetic response from the RSG and LSG. Immediately after EBUS-guided transtracheal needle injections of lidocaine, the sympathetic response was extinguished in the experimental group. The RSG and LSG sympathetic response persisted with saline injections in the control group. Two hours after the initial injection, the RSG and LSG responses were re-provoked, confirming reversibility of the sympathetic block.

Conclusions
In an animal model, bronchoscopic denervation led to a successful reversible sympathetic block. Human studies will be needed to determine whether this approach has potential clinical benefits for patients with refractory arrhythmias.

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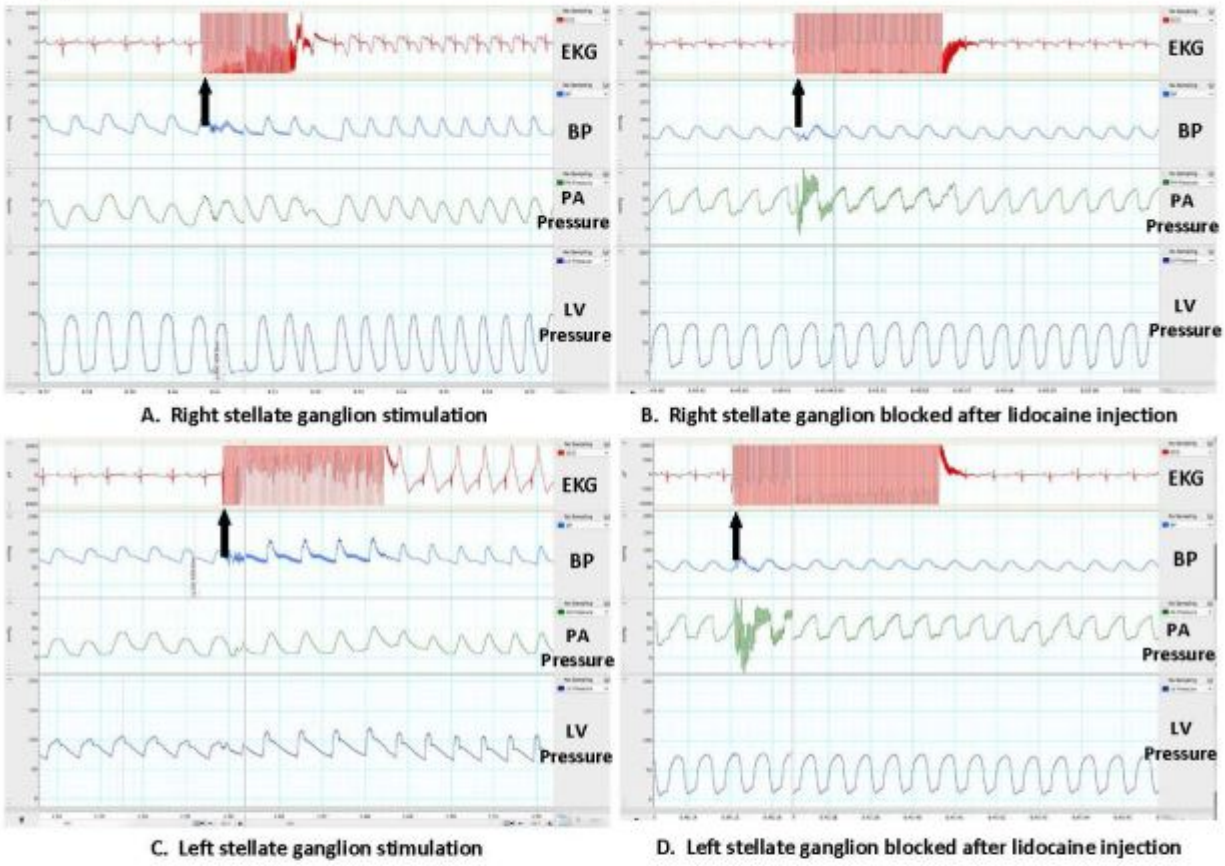
Figure 1



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(152) Submission ID#477806

The case of diagnostics of pulmonary lymphangiomyomatosis by in vivo probe-based confocal laser endomicroscopy of distal airways

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Zi-Qing Zhou – State Key Laboratory of Respiratory Health, National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Disease, First Affiliated Hospital of Guangzhou Medical University, Guangzhou, China.

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Probe-based confocal laser endoscopy (pCLE) allows for real-time histological imaging through bronchoscopy. We first present a case of patient with pulmonary lymphangiomyomatosis (LAM) in which pCLE imaging of distal airways were performed in vivo.

Methods
A 36 year-old women was diagnosised with LAM by transbronchial cryobiopsies. pCLE were performed in this patient in five lung segments which was followed by HRCT.

Results
During the in vivo pCLE, we found characteristic signs of LAM: Large (range from 50-200m) and strongly fluorescent mass sticking to vessels between alveolar elastin. Vessels around alveolar showed partial high-fluorescent. Elastin network of alveolar wall were partial destructed.

Conclusions
The pCLE imagings in patients with LAM are able to reveal characteristic changes. pCLE may be helpful for the diagnostic of LAM.

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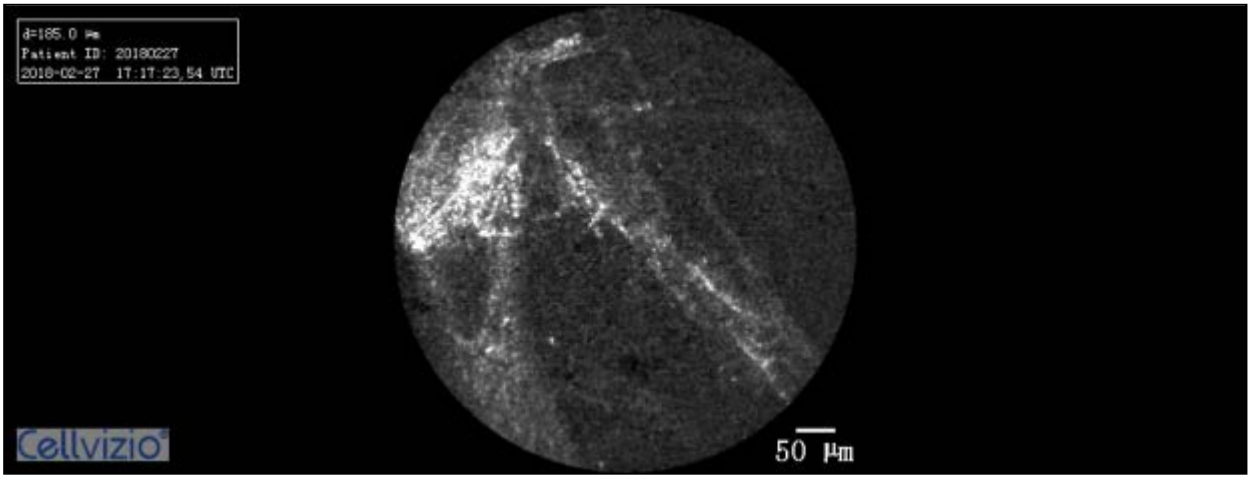

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(153) Submission ID#477809

The case of diagnostics of pulmonary lymphangiomyomatosis by in vivo probe-based confocal laser endomicroscopy of distal airways

Submission Type: Case Report

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Probe-based confocal laser endoscopy (pCLE) allows for real-time histological imaging through bronchoscopy. We first present a case of patient with pulmonary lymphangiomyomatosis (LAM) in which pCLE imaging of distal airways were performed in vivo.

Case Report
A 36 year-old women was diagnosised with LAM by transbronchial cryobiopsies. pCLE were performed in this patient in five lung segments which was followed by HRCT. During the in vivo pCLE, we found characteristic signs of LAM: Large (range from 50-200m) and strongly fluorescent mass sticking to vessels between alveolar elastin. Vessels around alveolar showed partial high-fluorescent. Elastin network of alveolar wall were partial destructed.

Conclusion
The pCLE imagings in patients with LAM are able to reveal characteristic changes. pCLE may be helpful for the diagnostic of LAM.

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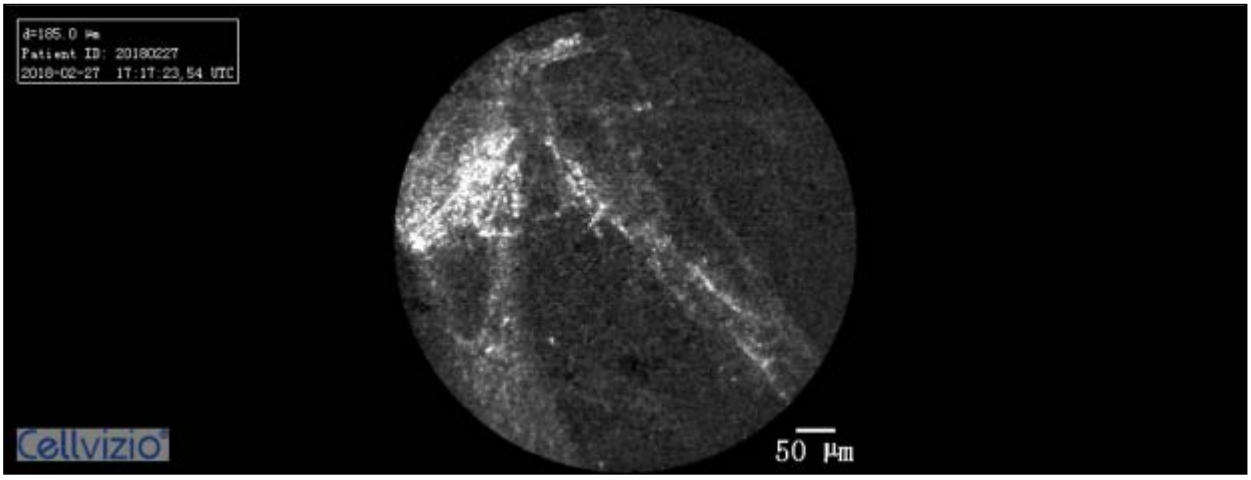

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(154) Submission ID#459516

The clinical and Bronchoscopic Features of Tracheobronchial Tuberculosis in Elderly Patients

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Lianjun Lin – Peking University First Hospital

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Trancheobronchial tuberculosis (TBTB) is a kind of tuberculosis which involves the tracheal and bronchial airways, with or without pulmonary infiltration. The manifestation of TBTB is versatile especially for the elderly patients. The purpose of this study is to demonstrate the clinical and bronchoscopic features of TBTB in the elderly patients.

Methods
The clinical information and bronchoscopic manifestation of 418 patients with TBTB confirmed by bronchoscopy were retrospectively analyzed. Patients were divided as the geriatric group (65 years old) and the non-geriatric group (<65 years old). Data were analyzed between these two groups and statistically analyzed.

Results
(1) 200 patients were included in the non-geriatric group (aged from 18-64 years old) and 218 in the geriatric group (aged from 65-90 years old). (2) The common symptoms included cough, sputum, dyspnea, fever, hemoptysis and chest pain. There is no difference between two groups as far as symptoms were concerned. (3) Fibrostenosis was the most common type underbronchoscopy and ulcerativenecrosis the second popular one. Lymphofistula type was more often observed in the geriatric group and there was statistical difference between these two groups (12.39% & 6%). (4) For the non-geriatric group, left upper bronchus was most often involved (46.5%) and the left main bronchus the second one (36.5%). For the geriatric group, right upper bronchus was most often involved (45.87%) and the left upper bronchus the second one (38.99%). There was statistical difference between two grousps as far as the locations was concerned: the left main bronchus (36.5% for the non-geriatric group and 20.18% for the geriatric group), right upper bronchus (32% for the non-geriatric group and 45.87% for the geriatric group) and right middle bronchus (13% for the non-geriatric group and 30.28% for the geriatric group).

Conclusions
There is statistical difference between geriatric group and non-geriatric group as far as underbronchoscopic phenotype and involved bronchus was concerned. More research should be done to dig the reason for the phenomenon.

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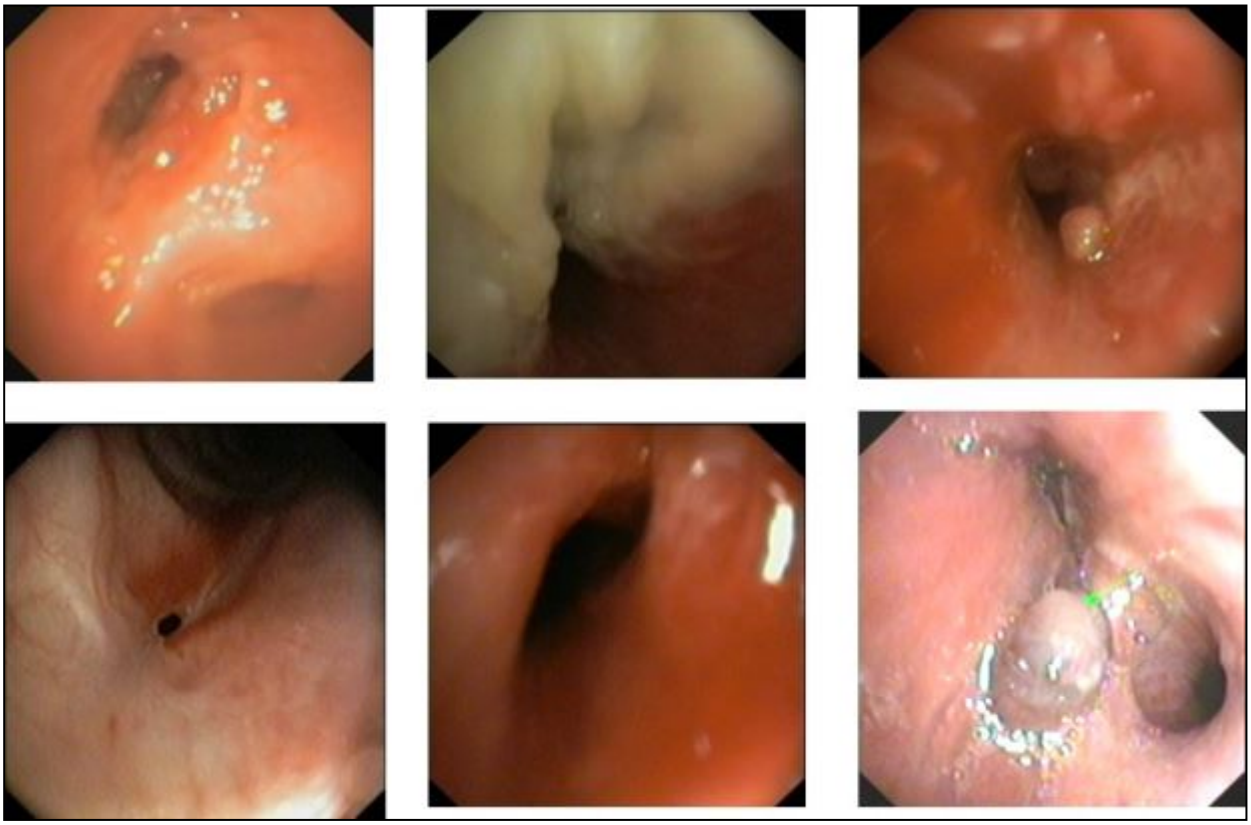

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2018 TBTB.pptx

(155) Submission ID#458444

The Clinical value of DNA polyploidy analysis on bronchial washing fluid for the diagnosis of pulmonary malignancy

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Yan Hu – Peking University First Hospital, Beijing, China

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Interventional Pulmonology

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Background
The DNA polyploidy analysis was performed on the bronchial washing fluid in the patients who had pulmonary shadow on CT scans. The aim of the present study is to evaluate the diagnostic value of the DNA polyploidy analysis on bronchial washing fluid.

Methods
We retrospectively studied 126 cases, in which 62 cases were malignancy and 64 cases were benign. Bronchial washing fluid was obtained by clinicians during bronchoscopy. Each bronchial washing fluid specimen was made into two slides. One slide was stained by HE for cytology analysis, and the other one was stained with Feulgen for DNA polyploidy analysis by the automatic imaging cytometer.

Results
The sensitivity and specificity of the DNA polyploidy analysis was 82.3% and 69.4%. The positive rate of bronchoscopic biopsy (including transbronchial ultrasound-guided biopsy) was 85.5%. There was no significant difference between the results of the biopsy and DNA polyploidy analysis (2 = 0.238, P = 0.625). The positive rates of traditional cytology analysis on bronchial brush and washing fluid were 60.3% and 33.3% respectively, which were significantly lower than those of DNA polyploidy analysis (2 = 7.087, 2 = 30.001, P <0.01). In the case with abnormalities at bronchoscopy, the positive rates of DNA polyploidy analysis of bronchial washing fluid was 82.9%. The positive rate of cytology analysis on bronchial brush was 71.9%. There was no significant difference between them (2 = 1.160, P = 0.281). But the positive rate of cytology analysis of bronchial washing fluid was 55.9%, which was significantly lower than that of DNA polyploidy analysis (2 = 5.927, P <0.05). In the cases without significant abnormalities at bronchoscopy, the positive rates of DNA polyploidy analysis, cytology analysis of bronchial brush and bronchial washing fluid were 81.5%, 44.0%, and 42.3% respectively. There was a significant statistical difference between them (2 = 10.571, P <0.01).

Conclusions
The DNA polyploidy analysis on bronchial washing fluid is an effective adjunct to diagnosis of lung malignant tumor. It is more sensitive than the traditional cytology analysis on bronchial brush and bronchial washing fluid.

(156) Submission ID#477994

The difference between silcone and metal stents for the treatment of airway strictures

Submission Type: Oral and Poster
Submission Status: Complete
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Interventional Pulmonology

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- No

Background
To compare the efficacy and complications of silicone stent and metal stent in the treatment of stenosis.

Methods
From January 2015 to June 2017, 100 patients including 70 males and 30 females with a median age of 52 years (19-86 years) accepted airway stent placement in our hospital. The causes of stent placement included lung cancer, esophageal cancer invasion, airway stenosis after tracheotomy or tracheal intubation, tuberculous tracheal stenosis, tracheal softening and so on.

Results
In our study,100 patients accepted the placement of airway stents in a one-time success, and the ventilation status of the patients was obviously improved. The evaluation was performed on the third postoperative day, and the propotion of dyspnea index with grade 3 and 4 significantly decreased from 91.9% to 3% (P<0.001). There was no significant difference between silicone stents and metallic stents. Complications of the two different stents were listed bellow: (1) Migration: The total incidence rate of migration was 12.1%, and there were significantly statistic difference between silicon stents (18%) and metallic stents (6%) (p<0.05). The

hourglass shape silicone stent and the suture fixation could significantly reduced the incidence of migration. (2) Granulation hyperplasia: The time of granulation proliferation in metallic stents was earlier than silicon stents. The incidence rate of granulation proliferation with grade 3 and 4 was about 33.2% at 3 months after placement in metallic stents, while the incidence was only 24.1% in silicon stents. (3)Secretion adherence: The incidence rate of secretion adherence (grade 2) was about 14.3% at 1 months after placement in silicone stents, while the incidence was 16% in metallic stents, and there was no statistical difference ($p>0.05$). The low incidence of secretion adherence in silicon stents might be associated with the smooth inner surface. (4) Inflammatory reaction: The incidence rate of inflammatory reaction more than grade 3 were 4.1% and 6.1% in silicon stent group at 1 months and 3 month, and the incidence rate were 6% and 6% in metallic stent group ($p>0.05$). (5) Stent associated respiratory tract infection (SARTI): 28/99 patients (28.3%) had SARTI,and all of which were lower respiratory tract infection. The etiology of SARTI was mainly Staphylococcus aureus (50%) and Pseudomonas aeruginosa (35.7%).

Conclusions

The selection of airway stent according to the central airway eight zone method could improve the curative effect of stent and reduce the incidence of migration.

(157) Submission ID#478051

The difference between silcone and metal stents for the treatment of airway strictures

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Hongwu Wang – Yes

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

To compare the efficacy and complications of silicone stent and metal stent in the treatment of stenosis.

Methods

Methods: From January 2015 to June 2017, 100 patients including 70 males and 30 females with a median age of 52 years (19-86 years) accepted airway stent placement in our hospital. The causes of stent placement included lung cancer, esophageal cancer invasion, airway stenosis after tracheotomy or tracheal intubation, tuberculous tracheal stenosis, tracheal softening and so on. 50 patients accepted metallic covered stents and the other 50 patients received silicon stents. 33 patients were placed straight-shape stents, including 18 metallic stents and 15 silicone stents. L-shape stents were used in 17 cases, including 11 metallic stents and 6 silicone stents. Y-shape stents were applied to 32 cases, including 21 metallic stents and 11 silicone stents. Hourglass shape silicone stents were placed in 18 cases.

Results

In our study,100 patients accepted the placement of airway stents in a one-time success, and the ventilation status of the patients was obviously improved. The evaluation was performed on the third postoperative day, and the propotion of dyspnea index with grade 3 and 4 significantly decreased from 91.9% to 3% (P<0.001). There was no significant difference between silicone stents and metallic stents. Complications of the two different stents were listed in tables . The etiology of SARTI was mainly Staphylococcus aureus (50%) and Pseudomonas aeruginosa (35.7%). Other pathogenic bacteria included Candida albicans (10.7%) and Proteus mirabilis (3.6%). The median time of SARTI diagnosis was 28 days (4-90 days). The median time to diagnose Staphylococcus aureus infection, Pseudomonas aeruginosa infection and Candida albicans infection were seperately 7 days (4-60 days), 53 days (15-67 days) and 63 days (28-90 days). 1 patients were diagnosed with Proteus mirabilis infection at the 28 day after operation.

Conclusions

The selection of airway stent according to the central airway eight zone method could improve the curative effect of stent and reduce the incidence of migration. Both silicone stent and metallic stent could significantly

improve the clinical symptoms. Stent migration was related to the shape of the stent.The straight shape stent was easy to migrate. The proliferation of granulation and the secretion adherence in metallic stents were more serious than in silicon stents. About 1/4 patients accepted airway stents could acquire SARTI . The main etiology was Staphylococcus aureus and Pseudomonas aeruginosa.

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Table 1 The score of complications in different time after metallic stent placement

Time (day)	N	Secretion	Inflammatory reaction	Granulation
7	50	1.06±0.12	3.02±0.56	0.02±0.28
30	50	2.18±0.47	0.99±0.62	1.42±0.98
60	50	1.68±0.57	0.64±0.38	1.88±0.74
90	44	1.75±0.60	0.55±1.08	2.15±0.66
120	17	1.15±0.37	0.31±0.57	2.04±0.88

Table 2 The score of complications in different time after silicon stent placement

Time (day)	N	Secretion	Inflammatory reaction	Granulation
7	49	1.06±0.43	2.88±0.96	0.04±0.18
30	49	1.12±0.39	1.47±0.77	0.72±0.22
60	49	0.99±0.28	0.77±0.26	0.89±0.34
90	49	1.05±0.23	0.64±0.35	1.02±0.77
120	48	1.17±0.60	0.45±0.56	1.21±0.89
180	48	0.89±0.57	0.55±0.38	2.01±0.33

(158) Submission ID#459526

The early stage intrapulmonary lesions of Stevens-Johnson syndrome(SJS) and toxic epidermal necrolysis(TEN) in children

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Stevenson-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are considered to be variants of the same disease with differing severities. The etiology included infection and adverse drug reactions. Pulmonary disease is one of its most serious sequelae. Severe bronchiolitis obliterans and pulmonary bullae have found in the recovery period. However, in the early stage, most of patients had only mild cough and no positive findings were found in the chest radiography. Only a few patients had respiratory failure or even death. Only isolated case reports have described that bronchial obstruction due to respiratory mucosal sloughing in TEN by bronchocopy. This study intends to explore the causes and pathology of early lung lesions in SJS and TEN, provides a theoretical basis for study on the relationship between early changes and long-term sequelae.

Methods
This study involved 3 patients with respiratory failure secondary to SJS and TEN in acute stage. We performed bronchoscopy, lavage treatment and pathological examination. We evaluate associated symptoms, degree of hypoxia, endoscopic appearance before and after treatment. Histopathological changes of the exfoliated tracheobronchial mucosal were examined.

Results

This study involved 1 case of SJS and 2 cases of TEN, they were aged 1.8, 9.2 and 9.5 years old. Their body surface area(BSA) were less than 10%, 30% and 50%. During the treatment, they developed acute respiratory failure, Chest CT showed atelectasis, emphysema with pneumoderm and pneumomediastinum, or uncharacteristic bronchial pneumonia. The bronchoscopy showed the tracheobronchial mucosa were widely exfoliated and blocked. Acute respiratory mucosal sloughing and block the lumen were the reason of respiratory failure secondary to SJS and TEN. After procedure, the lumen were smooth, respiratory failure were alleviated rapidly. Chest radiographs suggested that the atelectasis were improved significantly. The pathologic suggested necrotic epithelium shedding and bronchial and peribronchiolar inflammatory exudates.

Conclusions

Respiratory mucosal sloughing and inflammatory exudates in bronchial and peribronchiolar are the reason of acute respiratory failure secondary to SJS and TEN. It may be form bronchiolitis obliterans and pulmonary bullae in the recovery period.

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The early stage intrapulmonary lesions of Stevens-Johnson syndrome(SJS) and toxic epidermal necrolysis(TEN) in children.pptx

(159) Submission ID#459019

The effect of respiratory interventional therapy in the diagnosis and treatment of necrotizing pneumonia in children

Submission Type: Oral and Poster

Submission Status: Complete

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Necrotizing pneumonia (NP) is a severe complication of community acquired pneumonia, which is characterized by liquefaction, necrosis and cavity formation of the lung parenchyma.The incidence of NP in children increases recent yearsand may cause devastaing comlications such as empyema, pleural fistula, pneumothorax, respiratory failure,making treatment more difficult. This artical is to investigate the effect of respiratory interventional therapy in the diagnosis and treatment of NP in children: to sum up experience and further improve it.

Methods
The clinical data of 86 children with necrotizing pneumonia between 2013 and 2018 in our hospital were retrospectively analyzed to summarize the bronchoscopic findings of NP and the choice of interventional methods.

Results
All patients underwent bronchoscopy for 2~ 7 times, with an average of 2.8 times.Bronchoscopic findings of NP include 1Bronchial obstruction by sputum plug was common in early phase of NP38/86,44.2%; 2Turbid BALF was seen in nearly 78 patients90.1%,it could be earlier than imaging changes,which may suggest formation of necrosis, BALF in severe cases was rice soup like, and could be divided into different layers after resting; 3Destruction of bronchial sub branches, and even explore the necrotic cavities5/86,5.8%,all these 5 patients eventually accepted operative procedures4Bronchial stenosis was present in 32 patients37.2%, a large amount of necrotic substances can be seen in the lumen, bronchial stenosis or even occlusion in late stage .With rapid on-site evaluation by Diff-Quik stain of brushing specimens in 34 patients, we saw pyknosis,karyorrhexis,karyolysis and necrosis linin with massive neutrophil infiltration in 30 patients. Alveolar lavage100%,brushing36/86 ,mucosa biopsy12/86, and even TBLB3/86were used to obtain specimens for pathogenic analysisincluding smear test and culture.The positive rate of the brushing specimens 33.33% for smear test ,11.11% for culture seemed to be higher than that of BALF23.26% for smear test ,5.81% for culture ,but there was no statistical significance P0.05. For treatment,we gave adequate lavage for all the patients and stop when symptoms and turbidity of BALF improved or bronchial occlusion.We also use forceps to remove sputum plug and clean the necrosis,Other rare treatments include endoscopic application of Alteplase3 patients and meropenem 5patients. No adverse reaction appeared after intervention. 8 patients accepted surgery finally because of purulent pneumothorax.

Conclusions
Bronchoscopic changes could help to early identify and diagnose NP in children,and may be helpful for clinical judgment of course, condition and prognosis of the disease.Bronchoscopy could help to obtain more pathogenic evidence. Different interventional therapies could be choosen and were critical for disease recovery .

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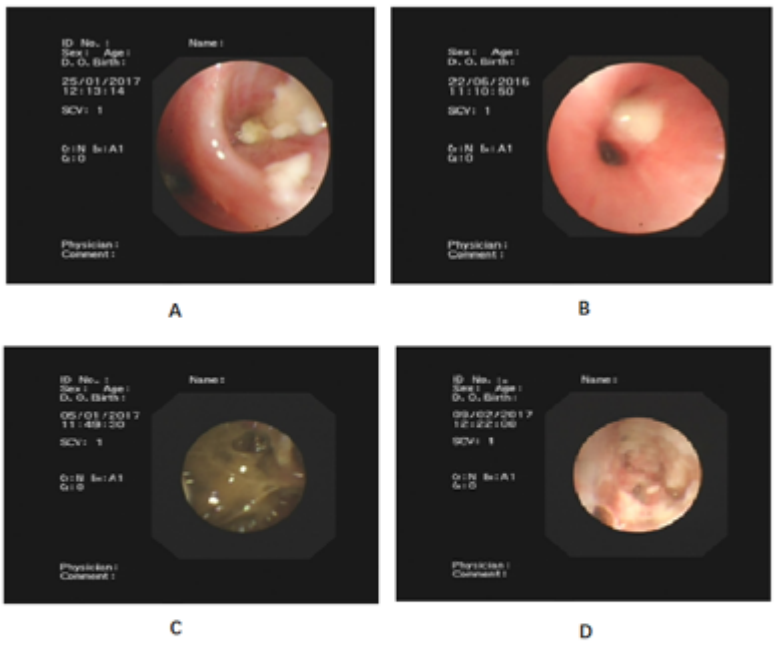

FIGURE1 Bronchoscopic changes of NP. A. Obstruction of sputum plug is obvious in early phase, need forceps to remove it. **B.** Lavage fluid is turbid, suggesting formation of necrosis. **C.** Destruction of bronchial sub branches, and explore the necrotic cavities. Once this happens, the situation is terrible and may require surgery. **D.** A large number of necrotic substances can be seen in the lumen, bronchial stenosis and occlusion.

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NP -.ppt

(160) Submission ID#459509

The effects of bronchial thermoplasty on airway smooth muscle and nerve fibers in beagle dog

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Yanqiuzi Cheng – The First Affiliated Hospital of Guangzhou Medical University

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Bronchial thermoplasty (BT) is a new non-pharmacological intervention method for asthma. Ablation of airway smooth muscle (ASM) is considered as the main mechanism. Recently concern on the role of nerve changes in BT is raised based on the observations in mucosa biopsy from asthma patients. In this study we analyzed the effects of BT on ASM and nerve fibers in the airway wall in beagle dogs after 12 weeks post-BT.

Methods
12 healthy beagle dogs aged one year were randomly and equally divided into control group and BT group. BT was conducted in dogs of BT group in the unilateral lower lobe, from which at least four transverse sections were obtained 12 weeks later. Transverse sections were obtained in control group without BT in the same way. Masson staining and HE staining were performed for evaluating the change of ASM. The change of nerve fibers post-BT in airway wall of transversely sectioned bronchi, which were divided into two types according to airway perimeter (Pi) (10000m

Results
No obvious pathological change was observed in ASM of control group. But in BT group, ASM were ablated in 61.4%(95%Cl 44.3-78.5%P<0.001)of airway circumference and replaced by collagen fiber 12 weeks after BT. Comparing with control group, PGP9.5 AOD in BT group were obviously reduced in the whole airway wall (0.43±0.20 vs 0.91±0.44 for 10000m
Conclusions
Besides ASM ablation, nerve fibers in airway wall in beagle dogs were also significantly reduced 12 weeks post-BT. Prompting that the change of nerve fibers maybe one of the essential mechanism of BT.

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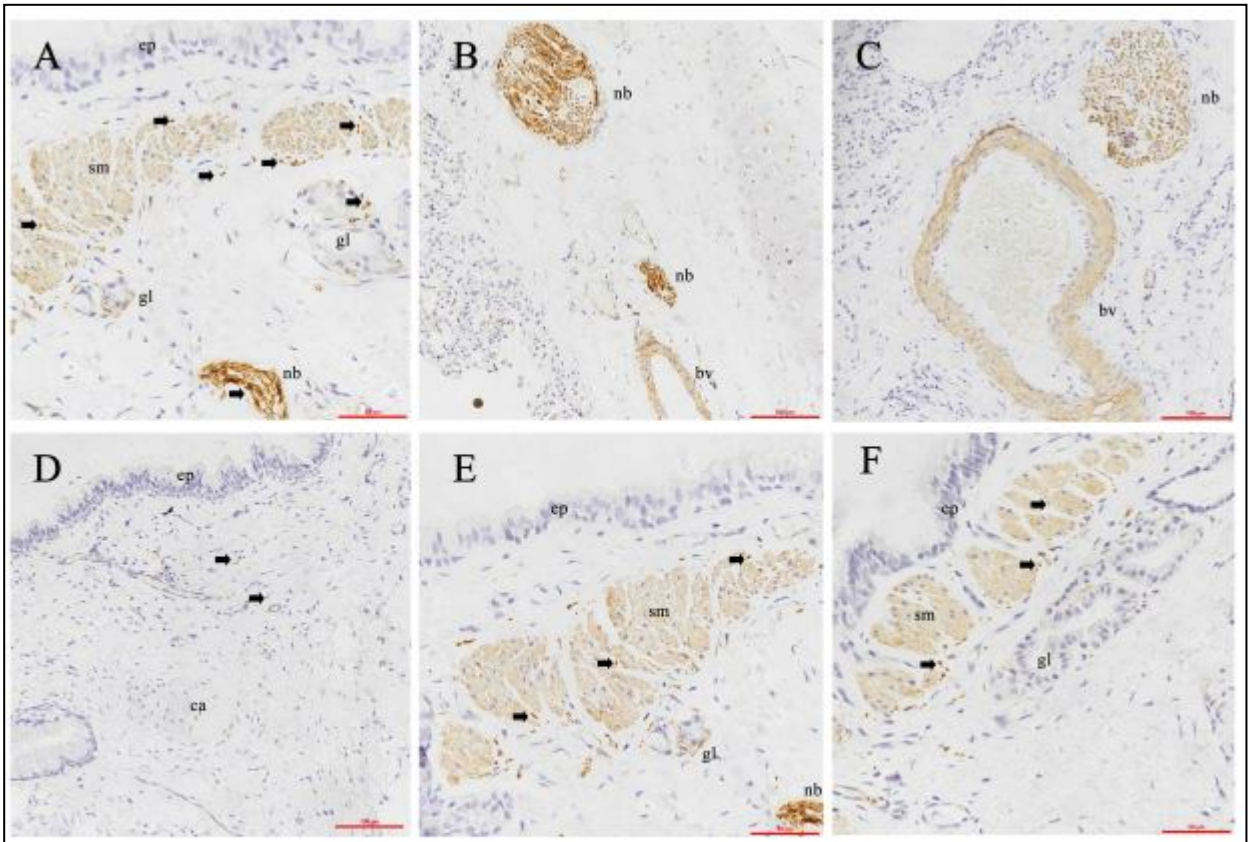

FIG:Immunohistochemistry staining of neuro-specific marker PGP9.5 in control group and BT group. A, PGP9.5-immunoreactive(arrows) of the airway wall in control group.B and C,Nerve bundle in the submucosa region in control (B) and BT (C) group.D,ASM-ablated region in BT group.E and F, Showing the normal ASM-associated nerves(arrows) in control group(E) and the residual ASM-associated nerves(arrows) in BT group (F). Scale bars=50μm(A,E,F) or 100μm (B,C,D).sm, smooth muscle; bv, blood vessels; ep, epithelium;gl,gland;ca,cartilage;nb,nerve bundle.

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The effects of bronchial thermoplasty on airway smooth muscle and nerve fibers in beagle dog.pptx

(161) Submission ID#458950

The efficacy and safety of transbronchial lung cryobiopsy in in interstitial lung disease: A prospective study

Submission Type: Oral Presentation ONLY

Submission Status: Complete

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- Yes

Background
To evaluated the efficacy and safety of transbronchial lung cryobiopsy (TBLC) and conventional transbronchial lung biopsy (TBLB) in interstitial lung diseaseILD.

Methods
a prospective self control study was conducted and the patients with interstitial lung disease of unclear diagnosis were sequentially enrolled between January2017 and April 2017 in First Affiliated Hospital of Guangzhou Medical University. All patients were underwent transbronchial lung cryobiopsy (TBLC group) and conventional lung biopsy (TBLB group) under general anesthesia. The size of biopsy specimens, the duration of procedures, complications and pathological results were collected.

Results
There were 25 patients (male:16 cases, female:9 cases) with mean age of (51.12 + 13.18) years. The specimens sizes of TBLC group and TBLB group were (12.33 + 4.87) mm2 and (3.07 + 1.86) mm2 (t=-18.268, P=0.000) respectively. The duration of procedures was (7.78±3.19)min and (5.4±2.08)min(Z=-3.001, P=0.003) respectively. There were no pneumothorax and severe bleeding. The mild to moderate bleeding in TBLC group and TBLB group were 47.17 and 18.87% (2=19.195, P=0.000) respectively. The diagnostic yield was 72% in TBLC group, there were valuable pathological results 2 cases (8%). It is failed to provide any useful valuable pathological results in 5 cases. In TBLB group, the diagnostic yield was 12%. There were not any useful pathological results in other 22 cases. There were 80% (20/25) and 12% (3/25) (2=20.779, P=0.000) useful pathological results in the TBLC and TBLB group respectively.

Conclusions
TBLC has obvious advantages in larger sample size and higher diagnostic yield compare to the TBLB, and with no serious complications. It is worthy of clinical application in the diagnosis of ILD.

(162) Submission ID#474838

The guide sheath method reduces hemorrhagic complications of transbronchial lung biopsy:

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Hirohisa Horinouchi – Saitama-City Hospital

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

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- No

Background
Application of guide-sheath technique for peripheral small nodule has been introduced for a decade. This technique improved the diagnostic yield of bronchoscopy. Since guidesheath is wedged to the bronchus that lead to the nodule, bleeding might be also blocked and decrease the risk of bronchial bleeding after biopsy. To survey the current state and complications of bronchoscopy, the Japan Society for Respiratory Endoscopy performed a nationwide survey. In this survey, complications of forceps biopsy were asked.

Methods
The survey form was mailed to 532 facilities accredited by the society. The numbers of procedures, complications, and deaths were investigated.

Results
Response rate was 79.1%(421 facilities). Death comprised to diagnostic bronchoscopy occurred in 11 (0.011%) of 98,497 cases.
A guide sheath method was applied in 23,916 cases and rest of 31,419 cases were done with conventional method. Complications of forceps biopsy developed in 1,019 cases in total and the incidence was 1.84%. The most frequent complication was pneumothorax (0.70%), followed by pneumonia/pleurisy (0.46%) and hemorrhage (0.45%). The complication rate was significantly decreased in the guide sheath group than in the non guide sheath group on bleeding (0.29% vs. 0.58%; $p < 0.001$). The overall complication (1.63% vs. 2.00%; $p = 0.002$) and mortality (0% vs. 0.02%; $p = 0.04$) rates were significantly decreased in the guide sheath group.

Conclusions
Conclusion: The frequency of hemorrhage in forceps biopsy of peripheral pulmonary nodule was decreased

by the use of a guide sheath.

(163) Submission ID#459566

The interventional therapy through flexible bronchoscope in one child with inflammatory myofibroblastic tumora case report

Submission Type: Case Report

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Inflammatory myofibroblastic tumors are uncommon tumors in children, and the tracheal inflammatory myofibroblastic tumor is rare. For the cases with trachea involved only , the surgical resection may not be the first choice for treatment. Here, we report the case of 10-year old boy who was treated by interventional therapy through flexible bronchoscope, and had a good result till now.

Case Report
A 10-year-old boy was hospitalized with the complaint of wheezing after exercises with cyanotic fingers for more than 40 days. There was no fever or other infectious symptoms, and no hemoptysis in the history. Then he went to other hospitals in which tracheal Inflammatory myofibroblastic tumor was diagnosed and a part resection of tumor was performed by rigid bronchoscopy to relieve the airway obstruction. He was sent to our hospital for a further diagnosis and treatment. Physical examination had no special finding. CT scan showed a mass in trachea. Flexible Bronchoscopy found the tumor was in middle part of trachea (about 7mm×5mm×30mm). So we choosed APC combined with cryotherapy through flexible bronchoscope to

ablation the rest tumor for several times. Now we have been following up the patient for about 8 months and found no visible tumor or tracheal stenosis.

Conclusion

For tracheal inflammatory myofibroblastic tumor in long length, interventional therapy through bronchoscope maybe a good choice compared with surgery. APC combined with cryotherapy through flexible bronchoscope maybe a good interventional therapy for tracheal inflammatory myofibroblastic tumor.

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Case Presentation----inflammatory myofibroblastic tumor.pptx

(164) Submission ID#458470

The novel airway stent delivery system versus standard airway stent delivery system in treatment of patients with malignant central airway stenosis, a multi-center, randomized, parallel-group, superiority trial

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Self-expandable metallic (SEM) airway stents are an important approach to treat malignant central airway obstruction (CAO),we designed a novel delivery system of the through-the-scope (TTS) SEM airway ,which can be directly implanted into the airways through the working channel of the flexible bronchoscopy Whether TTS delivery system implanted stent is superior to standard delivery system (Nanjing Micro-Tech company) with respect to the operation way is unknown.

Methods
In this multi-center randomized, parallel-group, superiority study, we enrolled patients with malignant central airway obstruction from 6 sites in China where the doctors skilled in deploying standard SEM stent, The main criteria of this trial was that the airway stenosis grade was more than 50% with dyspnea and age range from 18-75 years .The study was expected to enroll 144 patients who were randomly assigned (2:1) to place TTS stent (experimental group) or standard stent (Nanjing Micro-Tech company) (control group) by the simple randomization. The whole operation procedure was videotaped. The primary endpoint was operation time of airway stent implantation. Secondary endpoint was the successful rate of the release stent and the effectiveness and safety approach of the stent. This study is registered with the Chinese Clinical Trial Registry, number ChiCTR-IOR-17011431.

Results
From May 15, 2017 to December 30, 2017, 67 patients were enrolled, we analyzed 45 patients data from

three sites, The operation time in experimental group was less than that of control group (P<0.05)(Table 1).There was no significant difference in the age, gender ,stent placement, stent size between the experimental group and the control group.

Conclusions

The TTS SEM stent is effective and safe in treatment malignant central airway obstruction as the standard SEM stent , TTS delivery system implanted stent is superior to standard delivery system in operation time and TTS stent placement is easier to master by doctors.

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Image or Table

Table 1: Baseline characteristics of all patients and data analyse

observation items	statistical description	experimental group	control group	statistical method	P
site	N(miss)	32(0)	13(0)	Chi-square	0.4680
	01	14	5		
	03	6	5		
	06	12	3		
sex	Male+female	22+8	10+5	Fisher's Exact Test	0.7325
age	Mean±SD	64.13±7.95	65.33±8.83	T test	0.65
stent position	n	32	13	Fisher's Exact Test	0.4722
operation time	Mean±SD	86.37±72.64	275.42±134.15	Correction t test	0.00
	Min～Max	28～375	74～611		
	Median(P25～P75)	55(41～122)	267(195～328)		

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03the Affiliated Hospital of Qingdao University
06Nantong First People 's Hospital

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jun hong Jiang WCBC.pptx

(165) Submission ID#459062

The novel airway stent delivery system versus standard airway stent delivery system in treatment of patients with malignant central airway stenosis, a multi-center, randomized, parallel-group, superiority trial

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Junhong Jiang – Department of Respiratory and Critical Care Medicine, the First Affiliated Hospital of Soochow University, Suzhou, Jiangsu,China

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Self-expandable metallic (SEM) airway stents are an important approach to treat malignant central airway obstruction (CAO). We designed a novel delivery system of the through-the-scope (TTS) SEM airway stent,which can be directly implanted into the airways through the working channel of the flexible bronchoscope. Clinical superiority of the TTS delivery system stent versus standard delivery system (Nanjing Micro-Tech company) with respect to the operation way is unknown.

Methods
In this multi-center randomized, parallel-group, superiority study, we enrolled patients with malignant central airway obstruction from 6 sites in China pulmonologists skilled in deploying standard SEM stent. The main inclusion criteria of this trial was that the airway stenosis grade was more than 50% with dyspnea and age range from 18-75 years .The study was expected to enroll 144 patients who were randomly assigned (2:1) to place TTS stent (experimental group) or standard stent (Nanjing Micro-Tech company) (control group) by the simple randomization. The whole operation procedure was videotaped. The primary endpoint was operation time of airway stent implantation. Secondary endpoint was the successful rate of the release stent and the effectiveness and safety of the stent. This study is registered with the Chinese Clinical Trial Registry, number ChiCTR-IOR-17011431.

Results

From May 15, 2017 to December 30, 2017, 67 patients were enrolled, we analyzed 45 patients data from three sites, The operation time in experimental group was significantly less than that of control group (P<0.05)(Table 1). There was no significant difference in the age, gender ,stent placement, stent size between the experimental group and the control group.

Conclusions

The TTS SEM stent is as effective and safe in the treatment of malignant central airway obstruction as compared with the standard SEM stent . The TTS delivery system SEM airway stent is superior to the standard delivery system in operation time . TTS stent deployment and placement is clinically easier to deploy by most bronchoscopists.

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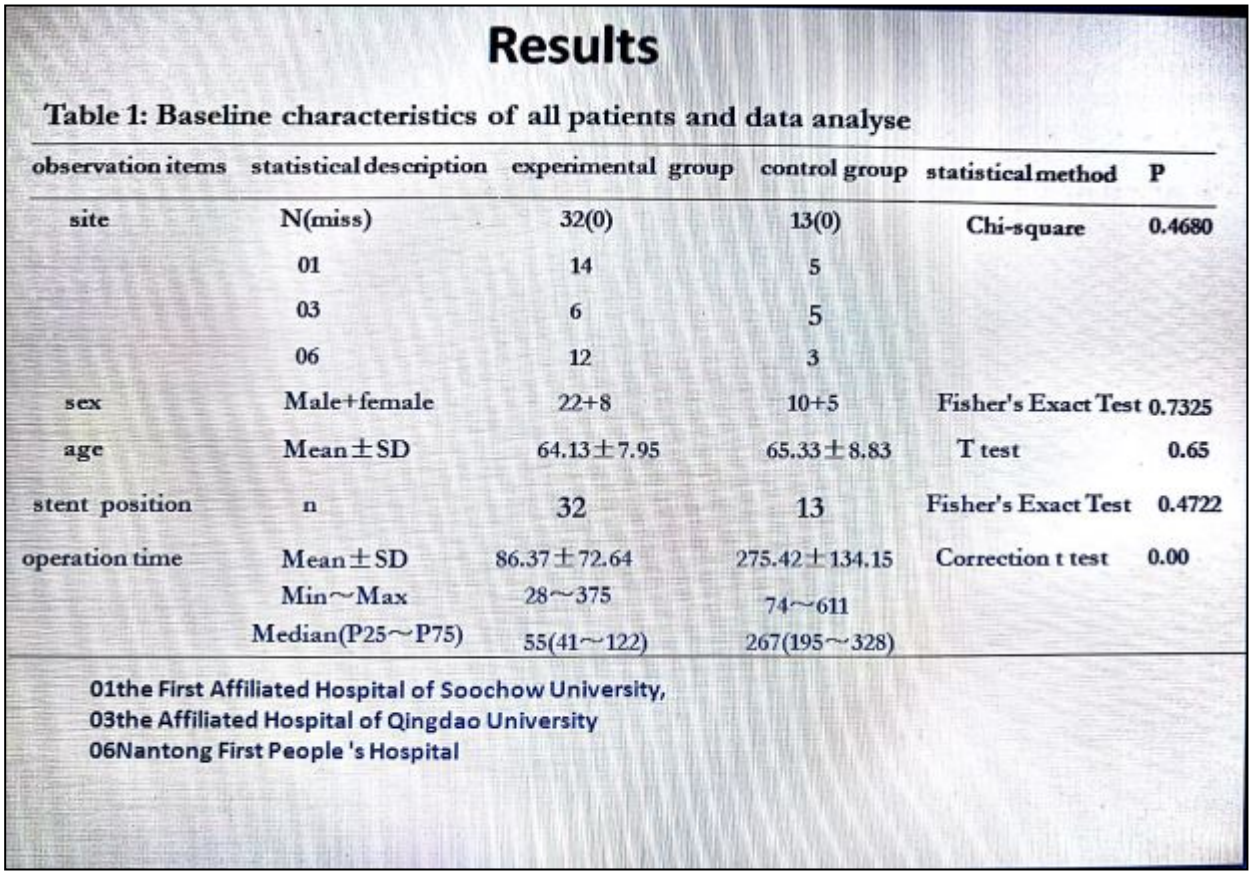

Results

Table 1: Baseline characteristics of all patients and data analyse

observation items	statistical description	experimental group	control group	statistical method	P
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	06	12	3		
sex	Male+female	22+8	10+5	Fisher's Exact Test	0.7325
age	Mean±SD	64.13±7.95	65.33±8.83	T test	0.65
stent position	n	32	13	Fisher's Exact Test	0.4722
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	Min~Max	28~375	74~611		
	Median(P25~P75)	55(41~122)	267(195~328)		

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Junhong jiang WCBIP.ppt

(166) Submission ID#459110

The Pediatric Clinical Application for Transbronchial Needle Aspiration with Mediastinal and Hilar Lymphadenopathy in China

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Leping Ye – Division of Pediatric Pulmonology, Department of Pediatrics, Peking University First Hospital, No.1 Xi'an Men Street, West District, Beijing

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
To explore the clinical diagnostic value and safety of the transbronchial needle aspiration (TBNA) in children's mediastinal and hilar lymphadenopathy, and deepen the understanding of pediatricians to the clinical application of TBNA.

Methods
A retrospective analysis of five clinical cases (including the first reported case of pediatric TBNA in China) of children, aged 3 years to 11 years, who were treated and successfully implemented TBNA in the Department/ Division of Pediatric Pulmonology for unknown reasons of mediastinum and hilar lymphadenophathy from October 2013 to December 2017 in the Second Affiliated Hospital and Yuying Childrens Hospital of Wenzhou Medical University and Peking University First Hospital; observing the efficiency and safety of the transbronchial needle aspiration biopsy in children; emphasizing the importance of mediastinal and hilar lymph node mapping and operational skills. It is interesting and worth mentioning, that not only using a 22G cell puncture needle firstly, but also for the first time with a 19G tissue puncture needle for another child respectively in China.

Results
Five children were diagnosed with mediastinum and hilar lymphadenophathy by TBNA for mediastinum and hilar lymph node. The cytopathology and acid-fast bacilli, bacterial and fungal inspection of specimen smear, culture and other tests assisted the diagnosis of the causes. Surgery went smoothly, there were no intraoperative and postoperative complications. Five children were diagnosed as primary tuberculosis of 3 cases, EB virus-associated lymphoproliferative disease and mycoplasma pneumoniae pneumonia, which assisted excluding lymphoma. Among the former 3 cases, 1 was primary complex, 1 with right pleural effusion and 2 with bronchial tuberculosis.

Conclusions
TBNA is a minimally invasive, effective, low-risk operation. It is safe and with good results in the etiological diagnosis of children mediastinum or hilar lymphadenophathy, especially in the diagnosis of respiratory infectious diseases in children, worth further exploration and promotion.

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(167) Submission ID#459605

The placement of dual stents under flexible bronchoscope in the treatment of patients with complex malignant airway lesions: two cases report and literature review

Submission Type: Case Report
Submission Status: Complete
Submitter: Fei Tang – Anhui Chest Hospital

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Objective To explore the feasibility and efficacy of the placement of dual stents in both sides of bronchus under flexible bronchoscope in the treatment of patients with complicated lesions characterized by high-degree stenosis on the lower part of the trachea and carina caused by the malignant tumor.

Case Report
Methods The clinical data of two emergency patients admitted to the endoscopy center of Anhui Provincial Thoracic Hospital from April 2013 to April 2017 with central airway stenosis caused by the malignant tumor on the lower part of the trachea and carina were retrospectively analyzed. Using a flexible bronchoscope, we placed two stents in the left and right main bronchus of each patient under local anesthesia.
Results Of the two patients, one was female and the other was male. Two stents were successfully placed in each patient at first time, and the symptoms of respiratory distress improved significantly after the operation. The dyspnea grade increased from grade - to grade 0-II, and SpO2 increased from 77.0 83[mean (80.1 ± 4.5)%] at high flow oxygen inhalation to 90.1% ~ 98.0% at natural ventilation [mean (94.1 ± 2.9)%], and these differences have statistical significance compared with pre-operative index. The two patients were treated with aerosol inhalation after the operation, and the short-term follow-up observation revealed such complications

as cough, foreign body sensation, chest pain, granulation and sputum retention.

Conclusion

The placing of dual stents in patients with complicated malignant airway lesions under flexible bronchoscope and local anesthesia can effectively relieve the airway obstruction, which has technical feasibility, good operability and reliable efficacy and which can be introduced to hospitals that have not yet applied the rigid bronchoscopy.

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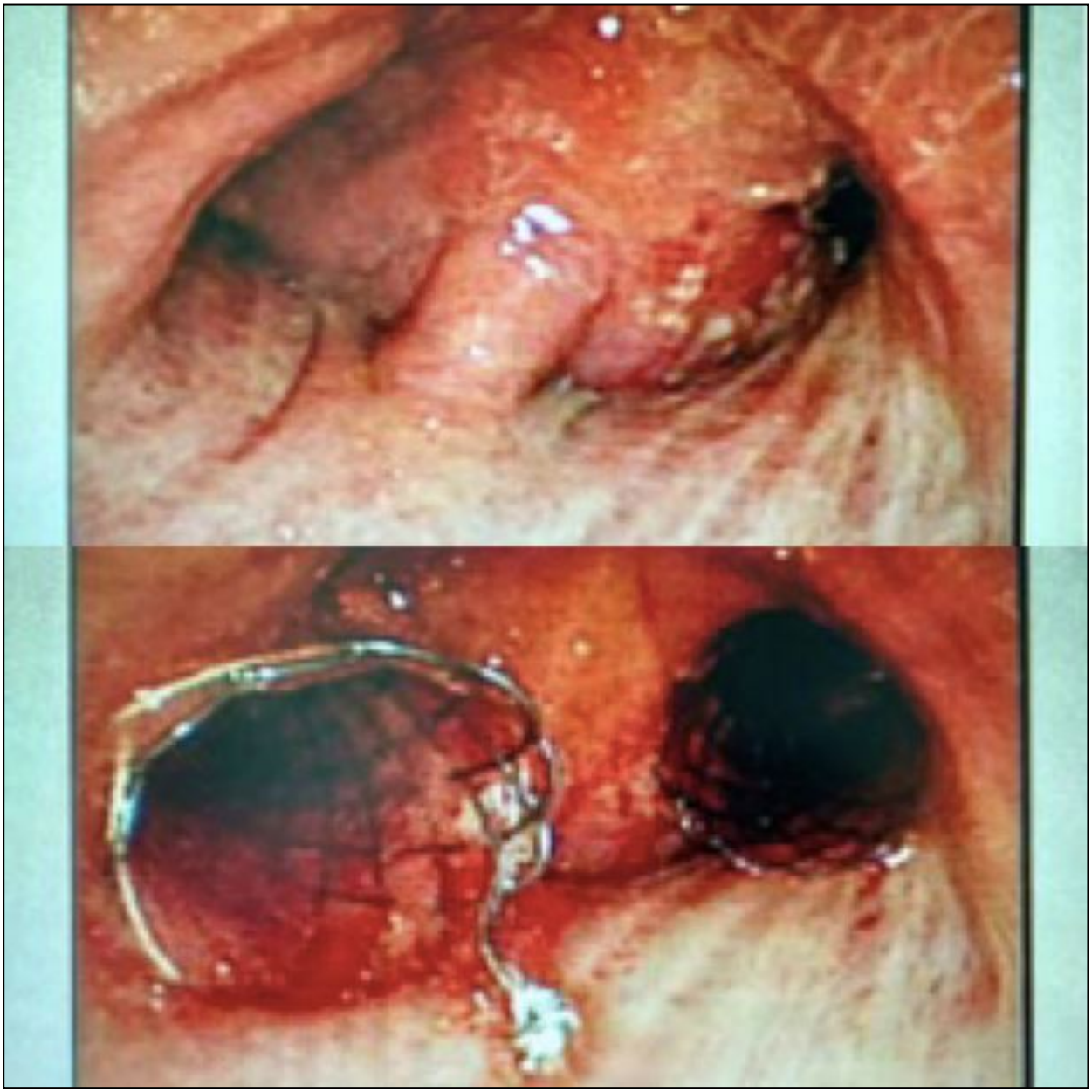

(168) Submission ID#459535

The Result Analysis of Bronchoscope for 18412 Lung Cancer Patients

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Jingjing Liu – pulmonology

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
To analyze the bronchoscope results of lung cancer patients through big samples and improve clinical diagnostic rate.

Methods
18412 confirmed lung cancer patients in Xiangya Hospital Central South University were conducted retrospective analysis.

Results
In 18412 lung cancer patients, from the perspective of the gender, male patients(15470) were significantly more than female patients(2942). The age was ranged from 14 years old to 89 years old, with the mean age of (59.27±9.46) years old. The microscopic distribution: The right lung(10323) was higher than the left lung(8779). It was common in double superior lobes(4468 patients in left superior lobe and 4145 patients in right superior lobe). Microscopic parting: There were most of patients with duct proliferation(8721), followed by patients with wall infiltration(8390), patients with inflammation(418), and patients with external oppression(174). Pathological pattern: There were most of patients with squamous carcinoma(8337), followed by patients with glandular cancer(3691), and patients with small cell cancer(3545). Male patients mainly had squamous carcinoma(7812), while female patients mainly suffered from glandular cancer(1357). In three stages of 1988-1997, 1998-2007 and 2008-2017, the morbidity of glandular cancer and small cell cancer was present in the rising tendency(18.68%, 19.54%, 21.41%, 10.21%, 18.68% and 21.06%). The morbidity of female patients with glandular cancer was also present in the rising tendency (26.29%, 35.10% and 38.31%).

Conclusions
To master various features of lung cancer through big sample analysis could contribute to improving the clinical diagnostic rate of lung cancer.

(169) Submission ID#457213

The Role of Conventional Transbronchial Needle Aspiration (TBNA) in the Assessment of the Epidermal Growth Factor Receptor (EGFR) Mutation in Lung Adenocarcinoma

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Li-Han Hsu – Division of Pulmonary and Critical Care Medicine, Sun Yat-Sen Cancer Center

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Role: Presenting Author
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
The presence of mutations in the EGFR predicts the effectiveness of the EGFR tyrosine kinase inhibitors (EGFR-TKIs). The Taiwan National Health Insurance permitted EGFR-TKIs as first-line treatment according to the EGFR mutation status in June 2011. We have reported the learning curve (Chest 2004) and safety (Clin Respir J 2016) of conventional TBNA, its utility after the introduction of PET/CT staging (Respirology 2007), and practice of using larger (19G) needles (Thorac Cancer 2016) before. Herein, we try to examine its role in assessment of EGFR mutation in lung adenocarcinoma.

Methods
Patients with proven or suspected lung adenocarcinoma with hilar-mediastinal lymph node (LN) indicated for conventional TBNA staging between June 2011 and June 2017 were enrolled. The cell block was prepared by the plasma-thrombin method (ThinPrep®). The TaqMan PCR and amplification-refractory mutation system PCR were used to detect activating and resistant mutations in exon 18-21 of the EGFR gene. Considering the cost effectiveness, only the sample with the highest tumor cell fraction in the same patient was chosen for analysis.

Results
Forty-four patients with a total of 53 LNs were aspirated. TBNA provided positive results for malignancy in 24 patients. True negative result was confirmed in six patients. The sensitivity and accuracy was 63.16%, and 68.18%, respectively. Among them, 14 patients (58.33%) had cancer cells on cell block eligible for EGFR mutation testing. Bronchial biopsy (n=3), neck LN FNA (n=1), and brushing (n=1), provided the higher tumor cell fraction for analysis in five patients. TBNA was the exclusive mean in nine patients (20.45%). For patients with an inadequate TBNA cell block, bronchial biopsy (n=5), neck LN FNA (n=3), CT-guided TTNB (n=1), and brushing (n=1) were used for analysis. EGFR mutation was detected in 14 patients (58.33%); nine had an in-frame deletion of exon 19, five had point mutation (L858R) of exon 21. On follow-up, the response rate to EGFR-TKI was 71.4% (10/14) and the disease control rate was 85.7% (12/14). Since June 2016, all needle passes rinse was processed for cell block except the first for on-site examination, and six of seven patients (85.7%) had a positive cell block.

Conclusions
Although the EGFR mutation status was mostly established by other diagnostic techniques, TBNA was the exclusive method in one-fifth of the patients. How to improve the diagnostic yield, how to obtain more cellular specimen, and how to handle the specimen becomes the inevitable challenges in an era of precision medicine.

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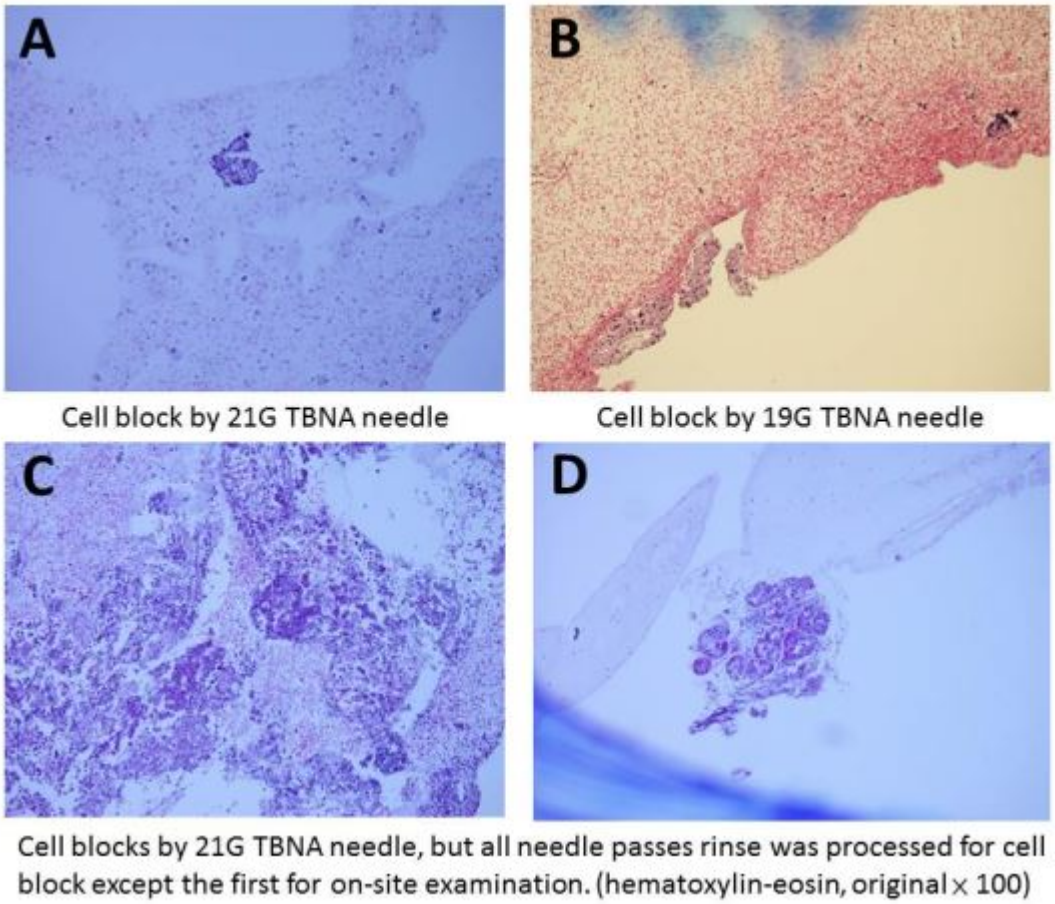

Cell blocks by 21G TBNA needle, but all needle passes rinse was processed for cell block except the first for on-site examination. (hematoxylin-eosin, original × 100)

Powerpoint Upload

Preliminary slides (Conventional TBNA for EGFR mutation in lung adenocarcinoma).ppt

(170) Submission ID#479509

the role of conventional transbronchial needle aspiration in the endobronchial ultrasound-guided transbronchial needle aspiration age

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Blanca De Vega Sánchez – Interventional pulmonology department Hospital Clinico Universitario Valladolid

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) -A- has almost replaced conventional transbronchial needle aspiration (TBNA) -B-. However, A requires from expensive equipment, a minimum volume of activity and specific training, thus its accessibility is limited. The aim of our study was to assess the diagnostic value of A in patients submitted to our hospital to perform B.

Methods
We performed a prospective study of mediastinal pathology detected by computerized tomography with ambulatory bronchoscopies under propofol sedation and double sampling procedure with A and B (3 and 4 samples respectively in each lymphadenopathy station -LS-; then analysing independently the technique and the LS). Diagnostic criteria were based on granulomas or histological signs of malignancy finding

Results
50 patients went under sequential study of A and B techniques, performing B and then A consecutively during the same procedure (6 were excluded due to incomplete follow-up): 84% men with a mean age of 63.2 years. 92 LS were analysed all of which included representative lymph node stromal cells and mean size of 13.1mm (small diameter). The sensibility of A vs B was 92 and 77% respectively. The positive and negative predictive value were: 100 and 72% (A) vs 100 and 50% (B).

Conclusions
Conventional TBNA in selected patients could avoid perform EBUS-TBNA.
A training should be stimulated throughout respiratory medicine fellowship in hospitals without EBUS-TBNA

Uploaded File(s)

Image or Table

	EBUS TBNA	TBNA
TRUE POSITIVE	33	28
FALSE POSITIVE	0	0
TRUE NEGATIVE	8	8
FALSE NEGATIVE	3	8

Powerpoint Upload

THE ROLE OF CONVENTIONAL TRANSBRONCHIAL NEEDLE ASPIRATION.ppt

(171) Submission ID#477759

The Role of Transbronchial Lung Biopsy, Transbronchial Cryobiopsy and Surgery in the Diagnosis of Lymphangioleiomyomatosis(LAM)

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Yao Yao – The First Affiliated Hospital of Guangzhou Medical University

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
On the basis of clinical features, typical high-resolution computed tomography (HRCT) patterns and at least one of the disease feature such as chylothorax, angiomyolipoma, tuberous sclerosis complex or elevated serum vascular endothelial growth factor (VEGF)-D, LAM can be diagnosed. However, most patient still need pathological diagnosis. This study aims to explore the diagnostic value of different pathological material drawing methods.

Methods
The informations of 113 patient diagnosed LAM since 2005 in our hospital were retrieved. Diagnostic methods and positive rate were analyzed.

Results
There were 112 female patients and 1 male patient with an average age of 37±9.5. 20 cases were diagnosed clinically(20/113, 17.7%). 58 cases had transbronchial lung biopsy (58/113,51.3%) with positive rate of 82.8%(48/58). 35 cases had surgery (35/113,31.0%) with positive rate of 100%(35/35). 4 cases had transbronchial cryobiopsy (4/113,3.5%) with positive rate of 100%(4/4). 2 cases had CT-guided lung biopsy (2/113,1.8%) with positive rate of 100%(2/2). There was no pneumothorax or hemorrhage needing special handling during the procedure of transbronchial lung biopsy and transbronchial cryobiopsy. More cases undergoing TBCB are needed to reach the desired power but LAM is a rare disease.

Conclusions
Surgical pathological diagnosis of LAM is the gold standard, while there is false negative rate in transbronchial lung biopsy. Transbronchial cryobiopsy with its high positive rate deserves more attentions.

Uploaded File(s)

Powerpoint Upload

LAM & TBCB.pptx

(172) Submission ID#459569

The Selection among Three Bronchus Positioning Methods Involving in Pleural Fistula

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Jingjing Liu – pulmonology

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
To discuss the new method of positioning the bronchus involving in pleural fistula and observe the clinical curative effects of using selective bronchial occlusion to cure refractory pneumothorax.

Methods
Through bronchoscope operation, three-cavity balloon catheter probe method, methylene blue injected in thoracic cavity, and Chartis balloon positioning were used to position the bronchus involving in pleural fistula. Then, autoblood+ thrombin were injected into the target bronchus to do selective bronchial occlusion.

Results
In 49 patients with refractory pneumothorax, Chartis balloon had 93.5% of positive probe rate and that of three-cavity balloon and Methylene blue was 82.1% and 55.6%, respectively. Positioning results: 22 patients(44.9%)were positioned in the lobar bronchus, 7 patients(14.3%) were positioned in segmental bronchus, 1 patient(2.0%) was positioned in main bronchus, and 19 patients(38.8%) got involved in adjacent multi-segment bronchus. Blocking results: (1) 41 patients had successful blocking, reaching 83.7% of success rate. 34 patients had successful blocking for once and 7 patients had successful blocking for twice. (2) 8 patients had failed blocking, showing 16.3% of failure rate, including 3 patients with failure for once and 5 patients with failure for twice. Follow-up results: After selective bronchial occlusion, pneumothorax recurrence rate was lower(only 7.3%).

Conclusions
As positioning the bronchus involving in pleural fistula, Chartis balloon has the highest accuracy, three-cavity balloon catheter probe is more economic and substantial, and methylene blue injected in thoracic cavity can be used as the auxiliary method as probing pneumothorax patients with pleural fistula after implementing pulmonary lobectomy, while it is economic, substantial, safe and effective to use selective bronchial occlusion to cure refractory pneumothorax, showing a few complications and low recurrence rate. It is deserved to be promoted for application.

(173) Submission ID#459117

The strategy of metallic stents extraction under bronchoscope in benign airway stenosis

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Guangfa Wang – Peking University First Hospital

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Metallic stents should be extracted if the treatment be performed or a severe related complication appears. The strategy of metallic stents depends on the site of treatment, the time since implantation, the kind and the

severity of the complication, the modalities available and the skills of the operator.

Methods

13 patients needing removing metallic stents were included in the study. The age was 17 to 78 years old (mean age: 47.6 yrs.) with 6 male and 7 females. The causes of metallic stents implantation were all benign disease but one due to squamous cancer.

All the procedures were performed through rigid tracheo-bronchoscope under general anesthesia. Different modalities and method were used according strategies in the interventional pulmonology center.

Results

The mean implantation time was 415.2 days. The etiologies of the benign stenosis were post-tracheostomy in 2, post intubation in 2, tuberculosis, post surgical procedure in 2 due to benign disease, congenital in 1 and unknown in 1. 16 stents, of which 8 uncovered and 8 covered, were successfully extracted from the 13 patients who had been implanted 18 stents totally. 2 metallic stents extraction was given up due to the disappearance of airway wall out side the stents.

No death happened during and after stents extraction. 3 patients entered ICU for temporary intubation and mechanical ventilation. Significant bleeding was observed in 3, subcutaneous emphysema and pneumothorax in 1, laryngospasm in 1. 2 patients had small stent debris left. 4 patients implanted silicon stents thereafter.

Conclusions

Metallic stents extraction is a challenge to interventional pulmonologist. The risk and benefit should be evaluated carefully. Multi-modalities are needed and different strategies should be adopted according to granulation and adherence of stents to the airway wall.

(174) Submission ID#459053

The Study of Radiation Exposure During Bronchoscopic Procedure Guided by LungVision, Novel Endobronchial Navigation and Guidance System

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Krish Bhadra – Rees Skillern Cancer Institute

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Disclosure Status: Complete
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Auris Surgical Robotics (Consultant); Biodesix (Consultant); BodyVision (Consultant); Boston Scientific (Consultant); Medtronic ILS (Consultant); Merit (Consultant); Veracyte (Consultant)

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Early detection of lung cancer relies on accurate identification and diagnosis of small pulmanory nodules. LungVision is a novel system (LungVision, BodyVision Ltd, Israel) that enables augmented endobronchial navigation and guidance of standard endoscopic biopsy tools towards small peripheral lung nodules (PLNs) and guided transbronchial biopsy. The system is capable of integrating information from existing imaging devices in the operating space into an upgraded fluoroscopic image and to present real-time visualization and localization of the airways and nodule during navigation and biopsy. In this study, we show that the radiation exposure from fluoroscopy during LungVision guided bronchoscopic procedure of both the patient and physician is comparable or lower than current practice and no additional procedure risk is being introduced.

Methods
Patients with PLNs referred for bronchoscopy were offered to participate in the study. CT scans were imported into the LungVision planning software, where the physician identified the targeted nodule and selected the desired pathway. LungVision system was used for real-time localization of the airways and nodule and for directional guidance and assistance during biopsy. Radiation exposure parameters were recorded during 25

consecutive bronchoscopies with fluoroscopic guidance with a mobile C-arm fluoroscopy system. The patients and physicians radiation exposure doses were measured.

Results

25 patients were recruited to the study. Average age was 70+9; 30% were male. Average lesion size was 18mm, and 70% of the nodules were located in the upper lobes. The mean effective dose of patients radiation exposure during bronchoscopy with LungVision was 0.50 milli-Sieverts (mSv). Physicians radiation exposure dose was assessed after 3 months at the completion of the 25 procedures.

No adverse events were reported. Successful navigation to PPNs, according to LungVision display, was achieved in all cases. lesion location displayed real time by the LungVision system was verified successfully by r-EBUS in all (100%) cases. Tissue samples were successfully acquired. The diagnostic yield was 80%.

Conclusions

This study demonstrates that patients are exposed to comparable or lower radiation doses (0.50 mSv mean) during LungVision-guided bronchoscopy in comparison to standard bronchoscopic navigation procedure (0.55mSv) while having a notable clinical benefits and higher diagnostic yield. The physician exposure was negligible with adequate standard shielding.

Augmented endobronchial fluoroscopic navigation is proven to be safe, feasible and accurate. The systems ability to show real time nodule localization and support guided transbronchial biopsy with a low dose radiation exposure presents LungVision as a potential method of choice for the image-guided biopsy of PLNs.

(175) Submission ID#454852

The utility of transbronchial rebiopsy for peripheral pulmonary lesions in advanced non-squamous, non-small cell lung cancer

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Akiko Tateishi – National Cancer Center Hospital

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
A rebiopsy in the patients with non-squamous, non-small-cell lung cancer (non-Sq, NSCLC) play an important role for the choice of the next drug therapies (i.e., cytotoxic chemotherapies, molecular targeted therapies, or immune-checkpoint inhibitors) after some previous treatments. Few studies have investigated the difference of the diagnostic yield and the molecular analysis between the rebiopsy and an initial biopsy for the purpose of the definitive diagnosis in advanced lung cancer patients. The aim of this study was to compare the diagnostic outcome between the rebiopsy and the initial biopsy.

Methods
Three hundred and one patients with advanced non-Sq, NSCLC who underwent transbronchial biopsy (TBB) using radial endobronchial ultrasound (R-EBUS) for peripheral pulmonary lesions (PPLs) at National Cancer Center Hospital from August 2014 to July 2017 were reviewed. All cases were divided into the two groups: a) rebiopsy group, the biopsy after some previous treatments and b) initial biopsy group, the biopsy for the definitive diagnosis. The diagnostic yield and the molecular analysis were compared between the two groups. In addition, the factors affecting the diagnostic yield of TBB were also evaluated using a univariate and a multivariate analyses.

Results
The diagnostic yield was comparable between the two groups: 86.8% (92/106) in the rebiopsy group and 90.8% (177/195) in the initial biopsy group, respectively, p=0.287. Among the diagnostic success cases, 93.0% (66/71) in the rebiopsy group could get adequate specimens for gene profiling and mutation analysis while 94.0% (126/134) in the initial biopsy group could get them, and there was no significant difference (p=0.765). On the other hand, factors affecting the diagnostic yield were as follows: positive bronchus sign (p<0.001) and location of the tumor at internal 2/3 (p=0.026).

Conclusions
The diagnostic yield of the rebiopsy group for PPLs was as high as the initial biopsy group. The TBB for PPLs is practical in the rebiopsy cases as with the initial diagnostic cases.

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(176) Submission ID#456758

Thoracic Ultrasound Versus Artificial Pneumothorax in Complications of Medical Thoracoscopy

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Junjun Huang – Peking University First Hospital, Respiratory and Critical Medical Department

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Evaluation and location of the approaches are the key steps of medical thoracoscopy. The gold standard for these steps in many countries are still artificial pneumothorax. Recently, thoracic ultrasound has been considered as one of the choices for the development of technology. While there was a lack of data in investigating the complications of medical thoracoscopy locating approach with artificial pneumothorax comparing thoracic ultrasound.

Methods
A total of 108 patients who underwent medical thoracoscopy were retrospectively observed in Peking University First Hospital from January 2011 to April 2017, including 92 patients of artificial pneumothorax group and 16 patients of thoracic ultrasound group. Propensity score matching (PSM) was used to balance the covariance between the two groups. And the complications of procedure between groups were compared.

Results
Before PSM, there was one unbalanced covariates in two groups. The overall complication rate was 7.6% (7/92) in artificial pneumothorax group, comparing 6.2% (1/16) in thoracic ultrasound group. There was no significant difference between the two group (P =0.848). After balancing the covariate with 2:1 matched, the overall complication rate was 9.4% (3/32) in artificial pneumothorax group, comparing 6.2% (1/16) in thoracic ultrasound group. There was still no significant difference between the two group (P =0.712).

Conclusions
Thoracic ultrasound is a locating approach method as safe as artificial pneumothorax, which could be a good choice in medical thoracoscopy.

(177) Submission ID#475701

Thoracoscopic pleural brushing -An innovative method of sampling in Diagnostic Medical Thoracoscopy

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Yuvarajan Sivagnaname – Sri Manakula Vinayagar Medical College& Hospital,Puducherry

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
The diagnosis of etiology of pleural effusions remains a challenging issue even after diagnostic thoracocentesis and closed pleural biopsy in significant number of cases. Medical thoracoscopy plays a huge role with greater diagnostic yield in the diagnosis of exudative pleural effusion.Pleural biopsy is the commonest mode of obtaining thoracoscopic pleural specimens from suspected pleural lesions. Pleural brushing can also be performed under direct vision in suspicious areas in addition to thoracoscopic pleural biopsy . The combined use of macroscopy, biopsy, brush cytology has been shown to have achieved optimal diagnostic results.Further decision to perform biopsy could be difficult in certain cases where the lesions are close to vascular structures and visceral pleura. So pleural brushing can be used to get thoracoscopic specimens safely in addition to biopsy samples which increases the diagnostic yield.
Aims and Objectives :
1.To evaluate the role of thoracoscopic pleural brushing in exudative pleural effusions.
2.To determine the sensitivity and specificity of thoracoscopic pleural brushing in exudative pleural effusions.

Methods
This prospective study was done in the Department of Pulmonary Medicine, Sri Manakula Vinayagar Medical College, Pondicherry, India on 80 patients with exudative pleural effusion in whom pleural fluid analysis and closed pleural biopsy results were inconclusive.All these patients were subjected to medical thoracoscopy after getting informed consent.Pleural biopsy and pleural brushings were taken and sent for analysis.

Results
Mean age of our study population was 58 years with male to female ratio of 1.2:1.Thoracoscopic pleural biopsy, which is considered as gold standard test was diagnostic in 76 of 80 patients (95%), whereas thoracoscopic pleural brushing was diagnostic in 74 patients (92.5%). Histhopathology revealed malignancy (82.7%), chronic granulomatous inflammation (11.5%) and nonspecific inflammation (5.7%). The sensitivity and specificity of pleural brushing were 96% and 75% respectively. Among the malignancies, adenocarcinoma was the most common variant. Interestingly, pleural brushing was the only diagnostic modalilty in one patient which was reported as adenocarcinoma.

Conclusions
Thoracoscopic pleural brushing is easy, convenient and safe procedure as it can augment the diagnostic yield of thoracoscopy.It is of significant value especially in sampling pleural lesions close to vascular structures and visceral pleura compared to pleural biopsy.

Uploaded File(s)

Image or Table

THORACOSCOPY		PLEURAL BIOPSY	
		POSITIVE	NEGATIVE
PLEURAL BRUSHING	POSITIVE	73	1
	NEGATIVE	3	3

Powerpoint Upload

Thoracoscopic Pleural Brushing Innovative method of pleural sampling.pptx

(178) Submission ID#459788

Touch imprint cytology of Radial EBUS forceps biopsy for the diagnostic of pulmonary nodules

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Jorge Dionisio – Instituto Português de Oncologia Francisco Gentil de Lisboa

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Touch imprint cytology (TIC) is a well-known cytopathology method of rapid analysis of biological tissues. It has been used in various diagnostic and therapeutic interventions in many different organ systems. TIC contain sufficient cells for diagnostic purposes. If examined by an experienced cytologist, TIC will have valuable diagnostic information for a desirable rapid diagnosis. Although it has some pitfalls, it is considered one of the best methods to provide a good cytological yield in fresh biopsy specimens.

Methods
To evaluate the diagnostic value and accuracy of rapid on-site TIC of biopsy specimens, obtained after Radial Endobronchial Ultrasound (EBUS) in patients with peripheral lung nodules, a retrospective analysis of bronchoscopy database and clinical records of patients submitted to bronchial biopsies (BB) with on-site TIC from January to December 2017 was performed. Sensivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy were calculated

Results
Eighty three patients were included, mean age of 63.3 years, 26 (31.3%) female and 57 (68.7%) male. History of smoking was obtained in 71 (85.5%) patients.
TIC classified as dubious in 6 cases were excluded.
Of the 77 cases included, TIC classified 34 (44.2%) cases as negative for neoplasia and 43 (55.8%) cases as positive due to the presence of atypical cells. The final histology results of the BB were negative for neoplasia in 35 (45.5%) cases and positive for malignancy in 42 (54.5%) cases.
Correlating the result of TIC and histology, we observed that 39 cases (50.6%) were true positive, 32 (41.6%) were true negative, 4 (5.2%) were false positive and 2 (2.6%) were false negative. Sensitivity, specificity, positive predictive value and negative predictive value were respectively 95%, 89%, 91% and 94%. Diagnostic accuracy was 92%.
An ulterior analysis of false positives and false negatives was done.

Conclusions
Our study suggests that TIC forceps biopsy specimens of pulmonary nodules may be a valid option in providing an early diagnosis of malignant cases and facilitating an adequate management of subsequent diagnostic studies.

(179) Submission ID#437331

Tracheal stenosis: An 8-year single-center experience

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Efsun Ugur chousein – No

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
The most ferquent cause of tracheal stenosis (TS) is internal/external trauma. The diagnostic gold standard is bronchoscopy. The treatment approach varies according to the etiology, localisation and degree of stenosis. We aimed to share a review of the treatment and outcome of our patients with TS.

Methods
Patients with a diagnosis of TS between the years 2009-2017 were included. We evaluated their demographic data and bronchoscopic findings. TS type was classified as complex, web-like and mixed. Treatment modalities (mechanical dilatation, mechanical resection, cryo, argon plasma photocoagulation (APC), stenting), complications encountered during follow-up and their management were investigated.

Results
The causes of TS were: traffic accident in 12 patients (12.63%), trauma in 6 (6.31%), surgery in 9 (%9.47) and postintubation for various medical diseases in the rest. 11 patients (12.22%) had posttracheostomy stenosis while 79 (87.77%) had postintubation stenosis. Mean length of intubatio was 15.32 ± 11.04 days. Mean length of follow-up was 14.04 ±20.71 months (1-96 months). The distance between the stenosis and the vocal cords was 2.79 ± 1.46 cm. Complex stenosis was the most common type, seen in 72 patients (80%). Mean length of stenosis was 1.73 ± 1.33 cm. 89 patients (98.88%) underwent mechanical dilatation, 15 (16.66%) cryo and 5 (5.55%) APC. 4 patients (4.44%) were treated with topical mitomycin-C and 32 (35.55%) had tracheal stent

placement. Mean number of rigid bronchoscopies per patient was 2.72 ± 2.52 (1-18). Complications following stent placement were migration (n=7, 7.77%), granulation (n=15, 16.66%), malacia (n=6, 6.66%), infection (n=2, 2.22%) and mucostasis (n=15, 16.66%). The earliest complication occured on the 5th day and the latest after 24 months. 20 patients had their stents removed because of complications and 12 of them developed restenosis. 8 patients with restenosis had a new stent placed. 26 patients out of 90 (28.88%) underwent surgery. 27 patients (30%) died during the follow-up period.

Conclusions

TS is a frequently encountered condition following intubation/tracheotomy. Various treatment options are available. Patients that underwent interventional procedures should be followed up closely because restenosis and other complications occur frequently.

(180) Submission ID#452098

Tracheobronchial stent uses and deployment practices around the world

Submission Type: Oral and Poster

Submission Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Tracheobronchial stents types, uses, techniques for deployment and extraction have practice variations around the world.

Methods
We collected responses by sending an online email survey to world interventional bronchology member societies, social media groups such as the Interventional Pneumologie, and WABIP on Facebook.

Results
There were 269 respondents from 47 countries. Europe had 97 respondents from 22 countries. There were 8 from Australia, 7 from Africa and 7 from South America(SA) respectively. North America(NA) had 72 respondents from 3 countries. Asia had 78 respondents from 14 countries.

For stent placements 15.4%(41) used fiberoptic bronchoscope(FB) only. Rigid bronchoscopy(RB) was solely utilized by 39.5%(105). 45%(119) used a combination of RB and FB (p value <0.001). RB is the most preferred technique in Europe(66%). For stent extraction 13%(18) used FB alone, 57%(82) used RB, and 36%(52) used a combination of RB and FB, (p value <0.001). Placement of stents were 51%(136) only by direct visualization. 23%(61) always used fluoroscopic guidance. 26%(70) used fluoroscopy in certain cases, (p value <0.001). Fluoroscopy was least used 15% in SA and Europe.

61%(164) decided stent sizing by measurements of stenotic and non stenotic areas on radiology. 11%(30) respondents used sizing devices. 65%(174) used a ruler and bronchoscope to measure stenotic areas. 38%(103) used visual estimation and experience. 6%(16) used serial balloon dilatation size. Size of the rigid bronchoscope, radial EBUS, stereoscopic bronchoscopy were other modalities noted.

To prevent clogging of stents, 22%(58) prescribed mucolytics. 73%(194) nebulized saline, 27%(71) Mucomyst Nebulization , 23%(62) Nebulized bronchodilators and other methods 9%(23) were advised respectively.

Covered self-expandable metal stents (SEMS) (44%) was the commonest type of stent used around the world. Silicone stents (37%), Y stents (15%), uncovered SEMS (12%), Montgomery T tube (5%) followed. Polyflex stents (3%) and custom-made stents (4%) were least used. Covered SEMS were least used 34-35% in SA and Europe. Uncovered SEMS was least used 9% in NA and Europe, most used in SA 25% and Africa 35% respectively. Silicone stents were most used in Europe 47%, and least used in NA and Australia. Custom made stents had average use of only 4%.

Biodegradable stent were not used by 93%(251). 8%(20) used it mostly in Europe. Mostly it's use was in benign stenosis 25%, followed by post lung transplant cases 10%, tracheomalacia 10% and post-operative stenosis 5%.

Conclusions
Tracheobronchial stent practice norms have evolved, but its practice variations lack uniformity, and have sparse evidence based studies for its direction.

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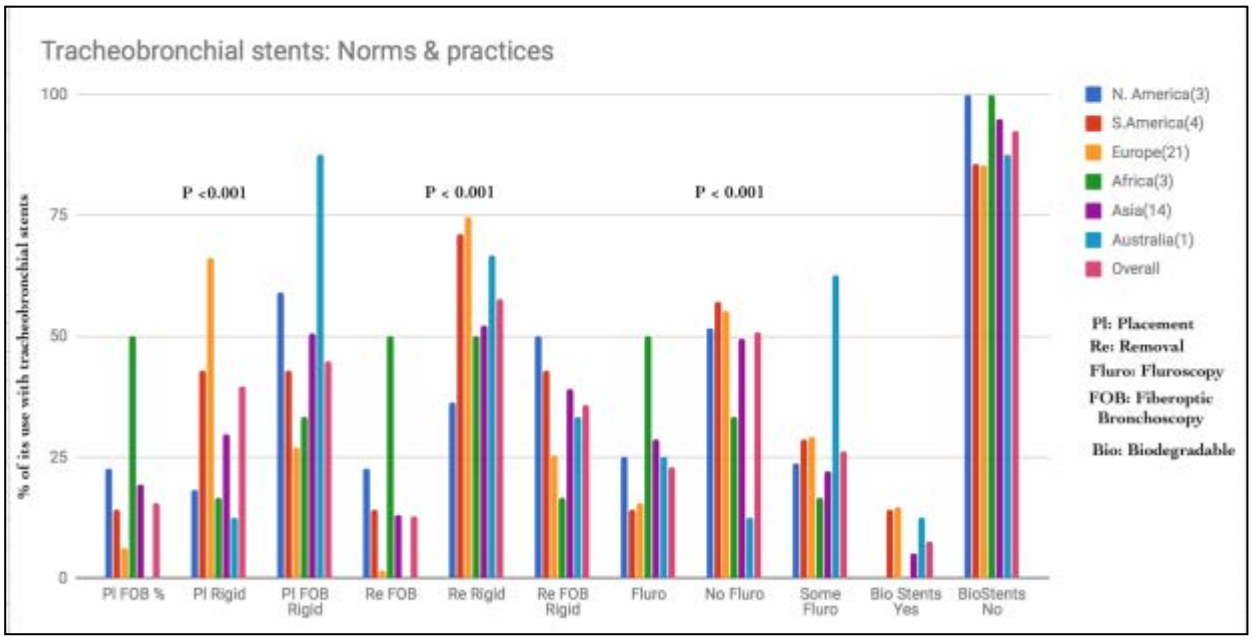

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(181) Submission ID#457996

Transbronchial cryobiopsy for diffuse parenchymal lung diseases

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Wei Zhang – Respiratory and Critical Care Medicine, Peking University First Hospital

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Interventional Pulmonology

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Background
The diagnosis of diffuse parenchymal lung diseases is challenging, and the quality of lung biopsy samples is crucial. Transbronchial lung biopsy with cryoprobe (cryobiopsy, TBCB) is a new technique for obtaining larger and better lung samples. We started to perform TBCB in September, 2017. The qualities of the samples, diagnostic yields and complications were reviewed.

Methods
Medical records of patients underwent TBCB for DPLD from September, 2017 to February, 2018 were reviewed. Patient was intubated with rigid bronchoscope under general anesthesia. Flexible bronchoscope was introduced and a thorough inspection and BAL was performed as per standard procedure. TBCB and traditional TBLB was performed in B6 or B10 at the bronchoscopists discretion. Cryoprobe was activated for 5-8 seconds before retracted with the flexible bronchoscope. The quality of the sample was classified as 4 categories: A. Contain intact alveolar and bronchiolar structures in normal proportions; B. Contain mostly bronchial and some alveolar structures; C. Contain mostly alveolar and some bronchial structures; D. Contain only bronchial structures, and no alveoli; E. Contain only alveolar structures, and no bronchi.

Results
There were 15 patients underwent TBCB, 9 males and 6 females. The average age was 50.5 (29-68). All the patients were diagnosed as DPLD before the biopsies. The size of TBCB samples was significantly larger than traditional TBLB (5.9±1.8 mm and 1.4±0.5 mm, respectively, p=0.001). TBCB samples were better than traditional TBLB (10 As and 2 Bs with TBCB, 2 As and 5 Bs with TBLB, respectively). The final diagnoses were made for all the patients by a multidisciplinary panel consisted of pulmonologists, radiologists and pathologists. Usual interstitial pneumonia was diagnosed in 3 cases, non-specific interstitial pneumonia 1 case, sarcoidosis 1 case, organizing pneumonia 2 cases, acute fibrinous and organizing pneumonia secondary to tuberculosis 1 case, follicular bronchiolitis 1 case, hypersensitivity pneumonia 1 case, granulomatosis with polyangiitis 1 case, lymphocytic interstitial pneumonia 1 case, pulmonary alveolar proteinosis 1 case, and CTD related interstitial lung disease 2 cases. Hemorrhage more than 20 ml occurred in 3 cases, all stopped by cold saline lavage and thrombin 500U. Pneumothorax were developed after TBCB in 2 cases, with chest tube implantation for 1 day in 1 patient.

Conclusions
TBCB is a promising technique for the diagnosis of DPLD with acceptable risk of complications.

(182) Submission ID#474343

Transbronchial Cryobiopsy in Diffuse Parenchymal Lung Disease (Kissing Technique) need for standardization.

Submission Type: Oral and Poster
Submission Status: Complete
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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Surgical lung biopsy was used to be considered where TBLBx was failing. However, complications of surgical biopsy are not simple & negligible

Methods
Methods
Our patients were given conscious sedation with midazolam &fentanyl. We used 3 bronchoscopes for the

procedure, a team of bronchoscopists , each to hold one bronchoscope. First bronchoscope Olympus PE-2 was passed through vocal cords transnasally, kept above the segment from which Cryobiopsy was planned. 2nd video bronchoscope T-150 was passed orally by using bite block , cryoprobe was passed through this bronchoscope and positioned as per HRCT with guidance of flouroscope to avoid pnemothorax, through the vocal cords KISSING the previous bronchoscope. Fogarty catheter was passed through this video scope in the desired segment. Both the cryoprobe and fogarty catheter were visualized. Fogarty balloon was kept deflated at the brim of the segment 3rd videoscope transorally was used to take the picture of both bronchoscopes kissing each other. Once in position the cryobiopsy was taken. The movement we removed the bronchoscope with cryobiopsy the fogarty balloon was inflated into the segment as bleeding is imminent post cryobiopsy in DPLD. Once ensured bleeding has stopped again biopsy procedure was repeated & successfully specimen retrieved.

Results

This has a good yield in cases where HRCT features diagnostic of usual interstitial pneumonia are not present.

Conclusions

Transbronchial cryobiopsy in cases of DPLD appears safe & feasible.

Bleeding represent the most frequent complications which was addressed by using the fogarty balloon simultaneously. Almost all cases bleed post biopsy so we recommended use of fogarty in almost all cases. All specimen of biopsy were large & well processed.

(183) Submission ID#458551

Transbronchial cryobiopsy in diffuse parenchymal lung disease: a Chinese perspective

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Shuliang Guo – Department of Respiratory and Critical Care Medicine, the First Affiliated Hospital of Chongqing Medical University

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Interventional Pulmonology

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Background
Transbronchial cryobiopsy (TBCB) is an emerging technology of lung biopsy gaining much attention recently in the diagnosis of diffuse parenchymal lung disease. Our respiratory center is the first in China to introduce this technique, and we have made innovative adjustments to meet domestic demands in our experience of over 40 cases.

Methods
The procedures were carried out either with rigid and flexible bronchoscopes at the same time (combined method) or with flexible bronchoscopes alone (flexible method), and no difference between the two methods was observed as for safety and productivity of the procedure. Deflated balloon catheters were not preventively placed except in the flexible method, and fluoroscopy is not utilized. We used 2 original classification systems for bleeding (categorization by the highest level of bronchial tree that blood reaches and categorization by the volume of blood collected by suctioning) in addition to the British Thoracic Society classification, and both new systems indicate severe bleeding with higher sensitivity than the latter.

Results
The procedural adjustments did not compromise safety of the procedure and quality of the specimens. A freezing time of 3-6 s was guaranteed in each biopsy, at least 3 samples were collected for each patient, and complications were under control.

Conclusions
Transbronchial cryobiopsy is a safe and promising approach for lung biopsy. The procedure with or without the rigid barrel were equally safe and productive, and the elimination of fluoroscopy does not compromise safety and productivity of the procedure.

(184) Submission ID#459029

Transbronchial cryobiopsy in interstitial lung disease a retrospective audit

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Tajalli Saghaie – University of Sydney

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Histolopathology is often required to achieve a multidisciplinary diagnosis in diffuse parenchymal lung disease. Surgical lung biopsy (SLB) remains the gold standard but is associated with significant morbidity and mortality. Recent emergence of transbronchial cryobiopsy (TBCB) as a potential alternative to SLB, promising less complications and a comparable yield, has divided the world of interventional pulmonology. There have been numerous publications reporting different and occasionally contradicting outcomes. Despite relative popularity of TBCB in our region, so far there have not been any published series from Australia.

Methods
All patients who underwent TBCB at 5 tertiary hospitals in Australia for diagnosis of diffuse parenchymal lung disease between August 2013 and June 2017 were included. A retrospective audit was undertaken to obtain demographic, baseline physiological and Procedural data. Complications and length of stay were recorded. Diagnostic value of TBCB was assessed by its histopathological and clinical impact. All biopsy specimens were reviewed by a single investigator for histopathological yield. Further histopathological evaluation of specimens to record size, presence of artefact, percentage of alveolar area and presence of pleura or proximal airway structures is under way.

Results
A total of 126 patients (68 male, average age 62 years) were enrolled in this study. Most cases were performed under general anaesthesia with rigid bronchoscope access. An average of 3 biopsies were obtained from 1-3 lobes. In 109 cases (86.5%), only mild bleeding was encountered with only 2 cases of severe bleeding (1.59%). Pneumothorax was detected in 19 cases (15%) with 13 requiring intercostal

catheters (10.3%). There was one case of exacerbation of ILD and one mortality within 30 days (0.79%). Most patients were discharged home the same day (69.8%) with average length of stay of 1.05 nights. Histopathology from TBCB was diagnostic independently in 83 cases (65.87%). Treating physicians found TBCB results useful in a multidisciplinary setting in 85.7% of cases.

Conclusions

Our data suggests that TBCB is a relatively safe procedure with an acceptable yield. Histopathological yield of TBCB specimens may be inferior to SLB, however in a multidisciplinary setting, information obtained by TBCB appears to be enough for it to be considered as an alternative to SLB.

(185) Submission ID#477969

Traumatic Bronchial Injury. The role of the Interventional Pulmonologist in initial stabilization

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Gustavo Cumbo-nacheli – Spectrum Health Medical Group

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Disclosure: Nothing to Disclose
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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Traumatic tracheobronchial injuries are rare, although life threatening. Airway occlusion, pneumothorax, and bleeding may lead to acute respiratory failure, and cardiovascular collapse. The role of initial airway stabilization remains key to improve outcomes.

We describe a case of a 32 year old male with traumatic left mainstem bronchus laceration, massive hemoptysis, and pneumothorax in which procedures performed by Interventional Pulmonology resulted in patient stabilization.

Methods

Retrospective chart review on a 32 year old male patient who sustained a motor vehicle accident resulting in multiple injuries. Photographs, bronchoscopic video are displayed.

Results

Initial airway stabilization of complete posterior transection of the left mainstem bronchus proved to be key in

this patient care.
Clinical suspicion, early diagnosis and prompt treatment prevented complications stemming from such injuries. A combined CTS and IP intervention resulted in complication prevention. Airway stenting and resection with end to end anastomosis were considered and discussed.

Conclusions
With mortality rates as high as 30% for traumatic tracheobronchial injuries, early IP and CTS involvement is essential. A multidisciplinary approach is paramount to limit complications stemming from airway injuries. Endobronchial stenting, selective intubation and surgical strategies are options to be considered.

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(186) Submission ID#477774

Treatment of Primary Tracheal Glomus Tumors: Two Case Reports and A Literature Review

Submission Type: Case Report

Submission Status: Complete

Submitter: Li Guo – West China Hospital of Sichuan University

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Glomus tumors (GTs) are rare soft tissue neoplasms. Several treatment options have been reported for tracheal GTs including thoracotomy, bronchoscopic electrocautery, Nd: YAG laser, and cryotherapy. However, few studies have evaluated the ideal treatment for tracheal GTs.

Case Report
A 30-year old man who presented with cough and expectoration for 1 month and who had been diagnosed as having a tracheal neoplasm by cervical and thoracic CT. The patient was a 47 years. He was admitted to our hospital presenting with intermittent hemoptysis for 3 years. Thoracic CT revealed a round tumor on the right posterior tracheal wall.Both of them were diagnosed as benign GTs. Histopathology of the tumor showed clusters of round epithelioid cells with eosinophilic cytoplasm and uniform round to ovoid nuclei surrounding dilated capillaries. Immunohistochemical staining was positive for smooth muscle actin (SMA).The tracheal tumor of first patient was located at the level of C7T1. Tumor resection was performed under fiberoptic bronchoscopy. The tracheal tumor in second patient was located in the lower trachea. Surgical tracheal resection and anastomosis were performed.Both of them achieved good results and no recurrence was seen at the final follow-up

Conclusion
We recommend choosing the most appropriate approach to manage tracheal GTs based on patients' general condition and tumor characteristics to obtain an excellent prognosis. Our two cases of tracheal GT were managed by different approaches and both achieved good results.

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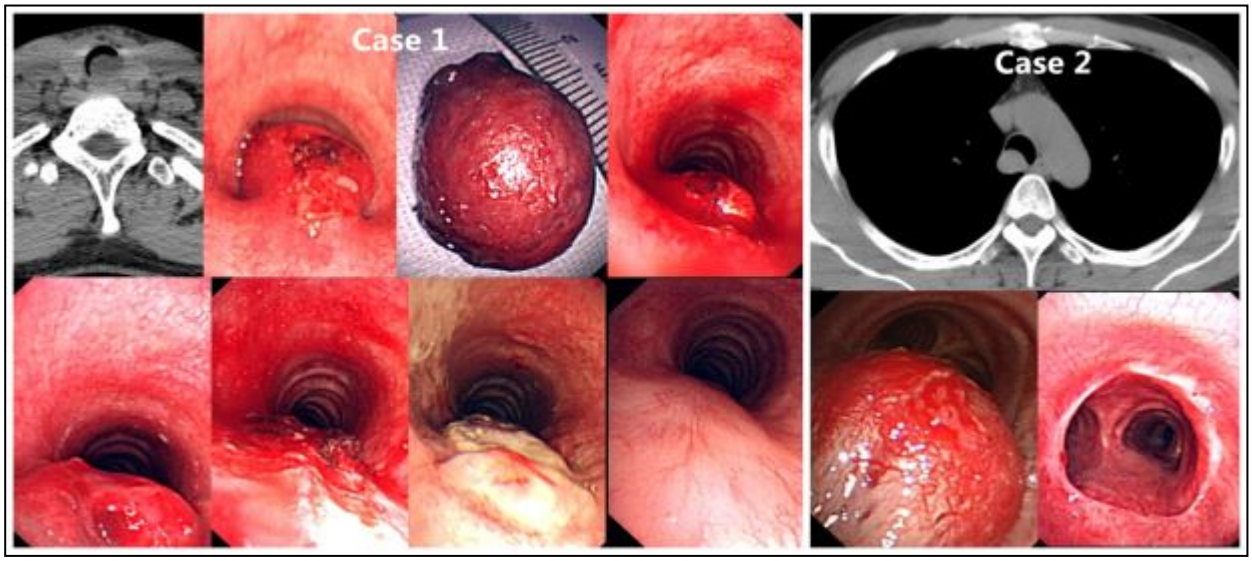
Case 1
Case 2

(187) Submission ID#477815

Treatment of secondary benign airway stenosis after tracheotomy with Montgomery T-tube

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Huihui Hu – Sir Run Run Shaw Hospital, Affiliated with Zhejiang University School of Medicine

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

With the improvement of surgical operation, increasing incidence of secondary benign airway stenosis, as a complication of long-term tracheal intubation and tracheotomy, leads to significant increases in morbidity and

mortality, and seriously affects quality of life of patients. Previous treatment of secondary benign airway stenosis was limited, mainly based on surgical resection and reconstruction. With the rapid development of endoscopic interventional therapy, there is an urgent need for new treatment methods with higher safety and efficiency.

Methods

This study retrospectively reviewed 14 patients who had treatments of secondary benign airway stenosis after tracheotomy with Montgomery T-tube between September 2015 and May 2017 in Sir Run Run Shaw Hospital, affiliated with Zhejiang University. The clinical data including clinical features, efficacy, complications and prognosis were retrospectively evaluated.

Results

Between September 2015 and May 2017, there were 14 cases of Montgomery T-tube placement due to benign airway stenosis, including 10 males and 4 females, with an average age of 46.1 years old. Complete airway atresia was 7/14, partial stenosis was 7/14, combined with airway granuloma and endoscopic granulation resection was 10/14, combined with scar stenosis and endoscopic balloon dilatation was 12/14. Plugging successfully was 13/14. Complications included sputum accumulation (14/14), secondary granulation tissue formation (7/14), subcutaneous soft tissue infection (1/14), and T-tube displacement (1/14).

Conclusions

Our study shows that, Montgomery T-tube (as a silicone-based artificial airway stent) placement under rigid bronchoscopy is a safe, feasible and effective tracheal forming method with well tolerance for patients with benign airway stenosis. Secondary benign airway stenosis after tracheal intubation and tracheotomy is an indication of Montgomery T-tube placement. Compared with the traditional tracheotomy, the advantage of Montgomery T-tube placement is easy to make the patient phonate, significantly improving the quality of life of patients. The safety of T-tube placement is high, and the postoperative complications include sputum accumulation and formation of secondary T-tube granulation tissue.

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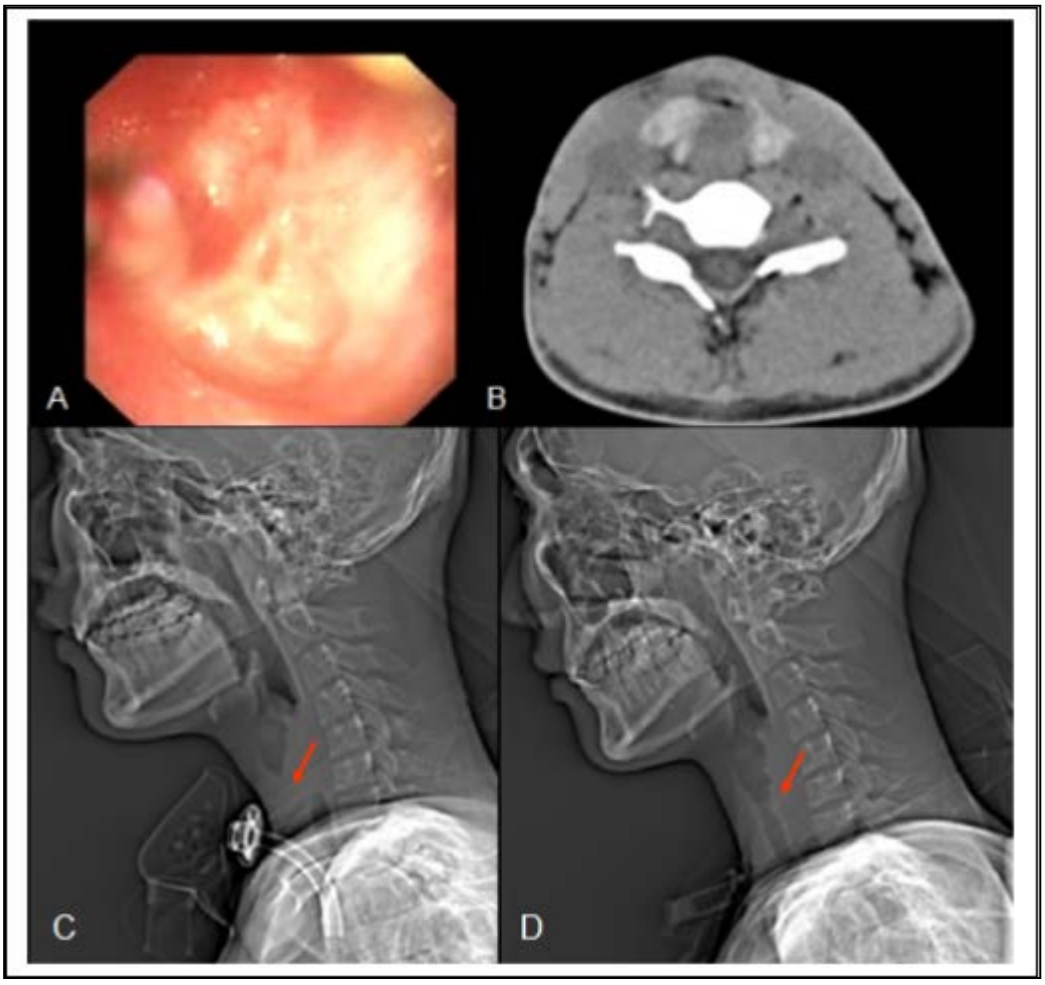
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(188) Submission ID#459898

Unusual foreign bodies in unusual patients

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Jorge Dionisio – Instituto Português de Oncologia Francisco Gentil de Lisboa

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

The majority of foreign body (FB) aspirations occur in children. FBs in adults, mostly related to food particles, are not common bronchoscopy findings, but if not treated, can result in life-threatening complications. People with tracheostomy belong to a specific subgroup of patients, as their lower airway is much more exposed to the exterior, but the separation of the airway from the alimentary tract prevent them from aspirating food particles. Aspiration of FBs through tracheostomy orifices is uncommon, and there are only a few references in the literature. The cleaning of the tracheostomy cannula is mandatory, but irresponsible behaviour can result in accidental aspiration of the cleaning material. Displacement and subsequent aspiration

of the tracheoesophageal voice prosthesis (TEP) is a rare complication. The authors report their experience of unusual FBs in this specific patient group.

Methods

Clinical and radiological files, bronchoscopy database and video reports of 19 bronchoscopy procedures on 17 patients with tracheostomy, for FB aspiration, between March 2000 and February 2018 in a single institution, were reviewed.

Results

The most frequent FBs found were TEP (55%). In one occasion we identified two prosthesis obstructing the right airways and both were removed during the same intervention. On two occasions cannula cleaning brush was identified. Among the removed FBs we have found a medical pill, a medical compress, an absorbable haemostat wrap, a plastic spoon and an unidentified vegetal structure. The most prolonged recovery was after aspiration of a haemostatic caustic pencil, which dissolved in the lower airway.

The most frequent symptoms were coughing, wheezing, and dyspnea.

The site of impaction was more frequently in the right bronchial tree (75%). The instrument most frequently used was a flexible foreign body forceps, but in certain cases a basket or a snare was used. There was no need to use the rigid scope for the extraction of the FBs as the removal was successful with the flexible bronchoscope in all cases.

Conclusions

In this series the majority of cases were related to medical and cleaning devices. The tracheostomy patients symptoms or the localization of the site of impaction did not differ from the observations published regarding adult FB aspiration.

The high success rate of flexible bronchoscopy could be due to the facilitated, wide access of the lower respiratory tract and the nature of FBs.

(189) Submission ID#459149

Use of bronchoscopic flexible cryoprobe at a university-affiliated community hospital

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Michael Bernstein – Stamford Hospital

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Disclosure Status: Complete

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Use of a bronchoscopic flexible cryoprobe has become an increasingly popular tool for endobronchial biopsies, parenchymal biopsies, and foreign body removal. Despite the more widespread application, little data on utilization and safety outcomes outside academic medical centers have been reported.

Methods
This is a retrospective case series review of the use of bronchoscopic flexible cryoprobe use since the introduction of this tool at our institution between 6/23/14 and 2/12/18. All procedures were performed using a flexible therapeutic bronchoscope (Olympus, Tokyo, Japan) with the 1.9 or 2.4 mm ERBOKRYO cryosurgical probe (Erbe, Tubingen, Germany). We defined moderate procedural bleeding as repeat use of epinephrine, cold saline lavage or use of bronchial blocker and severe bleeding as hemodynamic compromise or death. Retrospective review was approved by the institutional review board of our institution.

Results
104 procedures were performed on 102 patients. All procedures were performed by our interventional pulmonologist alone or in collaboration with another pulmonologist. 96.8% were performed in the operating room or bronchoscopy suite (ASA 3 [3-3]) and 3.2% were performed in the intensive care unit (Figure 1). For endobronchial lesions (n=55), the diagnostic rate was 80.0% (cryo) and 83.6% (all biopsy modalities used during the procedure); diagnoses included adenocarcinoma 41.3%, squamous cell carcinoma 19.5%, small cell carcinoma 10.8%, carcinoid 8.7%,extrathoracic malignancy 6.5% and other 10.8%. For nonvisible parenchymal masses or nodules (n=19), the diagnostic rate was 42.1% (cryo) and 73.7% (all modalities). For diffuse parenchymal disease (n=21), the diagnostic rate was 76.2% (both cryo and all modalities). For all diagnostic procedures (n=95), 5.3 % were complicated by moderate bleeding, and 1.1% by severe bleeding. 2.5% of the 40 parenchymal biopsies were complicated by a pneumothorax. The diagnostic rate for cryobiopsy of endobronchial lesions for the initial 10 procedures performed versus the subsequent 45 procedures was 60.0% vs. 84.4% (p=0.099, Fishers exact test).

Conclusions
Bronchoscopic cyroprobe was used in this university-affiliated community hospital for a broad array of diagnostic and therapeutic procedures with an excellent diagnostic rate and acceptable safety profile.

(190) Submission ID#358572

Use of endo-bronchial end-tidal CO2 test for the location of the pleural air leakage in intractable pneumothorax

Submission Type: Oral Presentation ONLY
Submission Status: Complete
Submitter: Yiming Zeng – The 2nd affiliated hospital fo Fujian medical university

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Interventional Pulmonology

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- Yes

Background

he bronchial occlusion technique has been proven to be an effective method for treating intractable pneumothorax, location of the affected bronchus of pleural air leaks is the most important step of transbronchoscopic bronchial occlusion for the treatment of intractable pneumothorax. Balloon occlusion test is the most commonly used technique, but failed in some cases. The aim of the present study was to determine 1) if endobronchial end-tidal CO2 (EtCO2) measurement can identify the affected bronchus which is the source of a persistent pleural air leak, 2) trying to establish a methodology forendobronchial EtCO2 test

in locating affected bronchus in intractable pneumothorax.

Methods
Twenty eight patients with intractable pneumothorax underwent bronchoscopy with 1) balloon occlusion test for the identification of affected bronchus and 2) Endobronchial EtCO2 measurement(EtCO2 test) at the orifices bronchi of the affected lung: an EtCO2 sampling catheter was introduced through the working channel of a flexible bronchoscope. The proximal end of the catheter was connected to an EtCO2 detector (Microstream®), and the exhaled gas was sampled from the distal end of the catheter with the help of the air pump inside the Microstream® (Figure 1). EtCO2 was sampled in different anatomical sites (figure 2): the lower segment of the trachea (above main carina), the main bronchus of the affected lung, and bronchial orifices for each lobe of the affected lung. . The efficacy of these two methods of affected bronchus identification was compared. The threshold Et CO2 (T-EtCO2) was determined.

Results
The positive rates of locating affected bronchus byendobronchial EtCO2 test, balloon occlusion test, and combination of the two techniques were 60.7% (17/28), 64.3% (18/28), and 96.4% (27/28), respectively. The average differences in EtCO2 between the affected bronchus and the main carina, main bronchus, and non-affected bronchus were (in mmHg) 4.41±1.99 (95% confidence interval: 3.55.3), 4.73±2.10(3.805.66), and 5.57±2.53(4.456.69), respectively.

Conclusions
(1)end-tidal CO2 (EtCO2) measurement is complementary to balloon detection of the leading bronchus. (2) Combination of the two is extremely effective in this identification. (3)A threshold value of > 5 mmHg is optimal for this technique.

Uploaded File(s)

Image or Table

Powerpoint Upload

Yiming Zeng, Endo-bronchoscopic PECO2 detection .pptx

(191) Submission ID#458016

Usefulness of Airway Stent Placement for Esophago-tracheobroncheal Fistula

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Kinya Furukawa – Tokyo Medical University, Ibaraki Medical Center

---

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Background
Recently, concurrent chemo-radiotherapy (CRT) for advanced esophageal and lung cancers shows high response rate and is established as a standard treatment modality, meanwhile, the incidence rate of esophago-tracheobroncheal fistula (ETF) as a complication is increasing. When once ETF is occurred, patient falls into severe condition because of massive sputa and pneumonia by aspiration of saliva even if stopping dietary intake. Therefore, the condition makes the treatment very difficult, also bypass surgery is usually difficult to indicate. In that case, the occlusion of ETF by stenting is only way to make possible to intake and prevent aspiration pneumonia. The aim of this study is to demonstrate the usefulness of airway stent placement (ASP) for patients with ETF.

Methods
A total of 16 patients (10 male, 6 female) with ETF were investigated retrospectively. Average age was 63.3 year-old. The benign diseases were 4 cases (tracheal tube: 1, herpes esophagitis: 1, post esophageal cancer operation: 2), and the malignant diseases were 12 cases (esophageal cancer: 8, lung cancer: 4).

Results
The histopathological type of malignant disease are all squamous cell carcinoma except one adenocarcinoma of lung. The location sites of ETF were trachea in 10 cases, trachea to right main bronchus in 1, right main bronchus in 3 and left main bronchus in 2. In 12 cases with malignant diseases, 10 cases were performed chemotherapy and/or radiotherapy in which 8 cases were already placed the esophageal or tracheobronchial stent. Observation periods after ASP were 7 to 446 days (Ave. 266 days) in benign diseases, and 24 to 552 days (Ave. 193.5) in malignant diseases. We determined effective in 14 cases, however, 2 cases were determined not effective caused by inadequate size selection of commercially available airway stent. The occlusion by esophageal stent is first choice, however, in the patients without esophageal stenosis or with ETF located at upper portion of esophagus, esophageal stenting is not indication because of making migration or uncomfortable feeling. In those situations, ETF occlusion by ASP adapts indication. Occasionally, we encounter the ETF without airway stenosis, in that case, commercial airway stent is sometime not available because of the size. Therefore, custom-made stent which can be just fit to tracheal lumen is necessary.

Conclusions
Our retrospective study demonstrated the usefulness of ASP for the patients with ETF. We should make a strategy of airway stenting for patients with ETF depend on their conditions.

(192) Submission ID#459024

Utility of cryobiopsy with radial probe EBUS guidance in diagnosis of solitary pulmonary nodules

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Tajalli Saghaie – University of Sydney

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No financial relationships or conflicts of interest.

Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Forceps biopsy through a guide sheet after locating the lesion using radial probe EBUS is an established technique in diagnosis of solitary pulmonary modules (SPN). The yield, however, drops significantly if the lesion is not concentric. Furthermore, the 1.7mm forceps often provide small samples which occasionally fall short of providing all the information required in malignancies. Using a cryoprobe in combination with radial EBUS could potentially provide larger samples and increase the yield in non-concentric lesions.

Methods

All patients who underwent radial EBUS cryobiopsy for diagnosis of SPN at Concord and Macquarie University hospitals in Sydney were included in this study. A retrospective audit was undertaken to obtain demographic, baseline physiological and procedural data. Complications and length of stay were recorded. Yield was determined by histopathology and clinical data.

Results

A total of 13 patients (4 female, mean age 73.4 years) have so far been included in the study. All procedures were performed under general anesthesia, with rigid intubation used in 12 cases. The lesion was identified in all cases using an EBUS radial probe with only 3 eccenteric lesion. Most targets were located in the upper lobes (66.6%). An average of 3.1 biopsies were obtained. No cases of pneumothorax or severe bleeding were observed. Only two patients stayed overnight after the procedure. Average diameter of specimens was 5mm. Definite malignant pathology was diagnosed in 5 cases with an overall yield of 11/13 (84.6%)

Conclusions

Radial EBUS cryobiopsy is a feasable alternative in diagnosis of SPN. The yield is comparable to previously reported techniques, however the larger specimens obtained by cryobiopsy could potentially provide invaluable data in diagnosis of malignant conditions.

(193) Submission ID#477794

Value of bronchoalveolar lavage fluid galactomannan detection in in the diagnosis of invasive pulmonary apergillosis by using endogenous marker to quantify the dilution

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Zhou Ming – 15248993835

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Bronchoalveolar lavage fluid (BALF) for bronchial alveolar lavage fluid (BALF) in infected lungs can provide high diagnostic efficiency for IPA, but it is susceptible to infusion volume, lavage time, and lavage fluid recovery. The influence of other lavage factors affects the diagnostic efficiency of IPA. The purpose of this study was to investigate the value of internal standardised BALF GM in the diagnosis of IPA.

Methods

Prospective collection of patients admitted to our Department of Respiratory Diseases due to pulmonary disease and high degree of suspicion of IPA or IPA patients. Thoracic CT positioning of bronchoalveolar lavage fluid in infected lungs to detect GM, albumin, and urea nitrogen concentrations, The diagnosed IPA and clinical diagnosis IPA were taken as the case group, while the non-IPA patients were the control group.

The same patient was first lavaged with 40 ml as the 40 ml lavage volume group, and the same site was lavaged with 40 ml as the 80 ml bronchoalveolar lavage volume group. Statistical methods were used to determine if there was a significant difference between the internal referenced BALF GM values and the diagnostic efficiency of the internal referenced BALF GM detection in IPA.

Results

1. The urea nitrogen standardized BALF GM value was not significantly different between the case group and the control group (p values were greater than 0.05); the albumin standardized BALF GM value was significantly different between the case group and the control group (p value Both are less than 0.05).
2. The ROC curve analysis found that when the BALF GM value 0.755 standardized with albumin in 40 ml bronchoalveolar lavage group was the cutoff value, the diagnostic efficiency was the highest, the sensitivity and specificity were 76.9% and 96.4%, respectively, and 80 ml alveoli. When lavaged albumin-labeled BALF GM value 0.751 was used as the cutoff value, the diagnostic efficiency was the highest, with sensitivity and specificity of 84.6% and 89.3%, respectively. The BALF GM value after albumin conversion in the combined group of the two groups When 7.54 was the cutoff value, the diagnostic efficiency was the highest, with sensitivity and specificity reaching 76.9% and 96.4%, respectively.

Conclusions

The internal standard bronchoalveolar lavage galactomannan assay can eliminate the influence of lavage factors on its dilution, which is beneficial to the early diagnosis of invasive pulmonary aspergillosis and is of great clinical significance.

Uploaded File(s)

Image or Table

BALF GM, albumin concentration, urea nitrogen concentration, urea nitrogen standardized BALF GM, albumin-matched BALF GM comparison in two different lavage dose groups (matched t test)

	Pairing difference T d f					T	d f	显著性
	Mean	standard deviation	Standard error average	95%CI Lower limit	95%CI Upper limit			
BALFGM1-BALF GM2	0.276051	0.470310	0.061229	0.153487	0.398614	4.508	58	0.000
BALF Urea Nitrogen Concentration 1-BALF Urea Nitrogen 2	213.276	271.586	35.355	142.506	284.047	6.032	58	0.000
BALF Urea Nitrogen Concentration 1-BALF Urea Nitrogen 2	41.55923	58.8269	7.658616	26.22885	56.88962	5.246	58	0.000
Urea nitrogen standardized BALF GM1-urea nitrogen standardized BALF GM2	17.18863	219.406	28.56418	-39.9908	74.36407	0.602	58	0.550
Albumin-normalized BALF GM1-Albumin-targeted BALF GM2	-0.478622	-15.5049	2.018561	-0.451921	3.561967	-0.2371	58	0.813

BALF GM1-2: BALF GM in the joint group of specimen group 1 and specimen group 2

BALF GM of BALF GM 1:1 specimen group

BALF GM2: BALF GM of specimen group 2

(194) Submission ID#457738

Value of Endobronchial Elastography in Diagnosis of Mediastinal Lymph Node

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Ching-Kai Lin – National Taiwan University Hospital

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Interventional Pulmonology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Neoplastic tissue containing higher cellularity and vascularity, cause a stiffer texture, comparing to the normal tissue. Endobronchial ultrasound (EBUS) elastography is a new technique which provides objective strain

image of the tissue compressibility may easily distinguish the hardness between benign and malignant lesion. The purpose of this study was to evaluate the utility of the EBUS elastography for investigating the possible malignant mediastinal lymph nodes (LNs).

Methods

A retrospective chart review of patients who underwent endobronchial ultrasound-guided transbronchial needle aspiration for unknown mediastinal lymphadenopathy and EBUS elastography from October 2016 to July 2017 was performed. We used the following EBUS sonographic features for malignant lymph node prediction: (1) length of the short axis, (2) shape, (3) margin, (4) echogenicity, (5) central hilar structure (CHS), and (6) coagulation necrosis sign (CNS). The classification of elastographgy was according to the distribution of the dominant colors: Type 1, predominantly non-blue (green, yellow and red); Type 2, part blue, part non-blue; Type 3, predominantly blue. The EBUS sonographic features and elastography were compared with the final pathology results or clinical follow-up. The sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy rate were calculated via standard definitions.

Results

A total of 206 LNs were retrospectively evaluated in 94 patients. In classifying Type 1 as benign and Type 3 as malignant, the sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy rates were 90.6, 82.6, 71.6, 94.7 and 85.2%, respectively. After excluding the type 2 elastographic LNs, the remaining 162 LNs showed EBUS elastography with the highest diagnostic yield and negative predictive value comparing to other conventional sonographic features. The positive predictive value is a little lower for elastography than CNS, but sensitivity is significant higher in the elastography.

Conclusions

The EBUS elastography is more accurate than conventional sonographic features. We think the EBUS elastography is a valuable tool for distinguishing the benign from malignant mediastinal lymph nodes.

Uploaded File(s)

Image or Table

Table. Diagnostic Yield of Elastography and EBUS Sonographic Features for Predicting Malignant LNs without Type 2 elastographic lesions

Morphologic Category	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Diagnostic yield (%)
Elastography	90.6	82.6	71.6	94.7	85.2
Short axis	88.7	54.1	48.5	90.8	63.6
Shape	67.9	61.5	46.2	79.8	63.6
Echogenicity	79.3	79.8	65.6	88.8	79.6
Margin	58.5	78.0	56.4	79.4	71.6
CHS	88.7	42.2	42.7	88.5	57.4
CNS	13.2	98.2	77.8	70.0	70.4

CHS, central hilar structure; CNS, coagulation necrosis sign; LN, Lymph node; NPV, negative predictive value; PPV, positive predictive value

(195) Submission ID#476017

Assessment using the SAVE Score predicts difficulty of tracheal intubation in the operating room.

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Garrison Davis – Geisinger Commonwealth School of Medicine

---

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Disclosure:

Disclosure Status: Complete

Disclosure: Nothing to Disclose

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Laryngology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Predicting the difficulty of an endotracheal intubation with an objective, reliable, and broadly applicable score remains elusive despite extensive research. Previous attempts at creating conglomerate scores such as the Wilson risk sum score or LEMON method suffer from poor specificity resulting in limited implementation. Any combinations of these assessments are possible, yet there are no strict guidelines on how to combine them nor assess the results of such a combination. This aim of this study is to assess the ability of the novel SAVE (Sorour Airway Visualization Evaluation) score in providing an accurate prediction of endotracheal intubation difficulty within the operating room setting.

Methods
Attending anesthesiologists and certified registered nurse anesthetists (CRNA) calculated the SAVE score, and documented the laryngeal view following intubation in the operating room. Clinical decision making was not altered based on the score. Data were analyzed using the chi-squared test or Fisher's exact test where appropriate.

Results
Through the years 2017 and 2018, 359 patients were found to have been evaluated with the SAVE score. The SAVE score predicted difficulty in intubation with a sensitivity found to be 44.4% (95% CI:13.7% to 78.8%); specificity =94.9% (95% CI: 92.0% to 97.0%); and negative predictive value = 98.5 % (97.3% to 99.3%).

Conclusions
Implementation of the SAVE score for airway assessment appears to successfully predict the ease/difficulty of endotracheal intubation within the operating room setting. The data should be evaluated to implement further changes in the SAVE score to improve sensitivity.

Uploaded File(s)

Image or Table

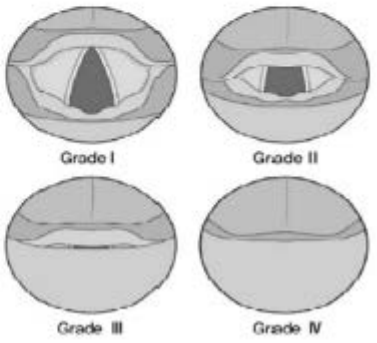
Pre Intubation Evaluation

Parameter	Value	Score
H/O Difficult Airway	Present	5
Disease associated w/ difficult airway	Present or suspected	3
Malampati	3 or 4	2
Thyro-mental distance	<3 finger breadths	2
Mouth Opening	<2 finger breadths	2
Neck Mobility	<30° hyperextension	2
Neck Circumference	>40cm	1
BMI (Body-Mass index)	>30	1
	>40	2
Thyro-sternal distance	<2 finger breaths	1
Mandibular angle	Obtuse	1
Overbite	Present	1
Absence of upper incisors	Absent upper incisors	-2
	Total Score:	
Score ≥ 5 = Difficult Intubation		

Post Intubation Evaluation

Laryngeal View		Intubation Requirements
Grade 1	☐	Cricoid pressure
Grade 2	☐	Extreme hockey stick
Grade 3	☐	Extreme neck position
Grade 4	☐	Bougie
Laryngoscope not used	☐	Multiple attempts

Comments:



(196) Submission ID#454952

Older age, male sex and several underlying diseases are associated with cough reflex threshold desensitization: a cross-sectional study using a new laryngopharyngeal endoscopic esthesiometer and rangefinder (LPEER)

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Luis Giraldo-Cadavid – Universidad de La Sabana; Fundacion Neumologica Colombiana

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Laryngology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Several factors have been found to produce chemical cough reflex desensitization; however, it is unknown which factors may affect the cough reflex threshold (CRT) mediated through mechanical stimuli. We aimed at identifying factors affecting the CRT triggered by mechanical stimuli (air-pulses) using a new laryngopharyngeal endoscopic esthesiometer and Laser rangefinder (LPEER) and a validated bedside method.

Methods
We prospectively recruited a cohort of 118 patients at two tertiary care university hospitals, who underwent fiberoptic upper airway endoscopy because of upper aero-digestive symptoms including dysphagia, cough, gastroesophageal reflux (GERD). The CRT was measured by delivering air-pulses of increasing intensity, at the aryepiglottic folds using the LPEER connected to a pediatric fiberoptic bronchoscope. Risk factors for CRT desensitization were explored by clinical evaluation using a standard form. Dysphagia was rated using the 8-point penetration-aspiration scale measured during the Fiberoptic Endoscopic Evaluation of Swallowing. We performed a multivariate analysis using multiple linear regression adjusting for confounders.

Results
The mean age (years±SD) of the cohort was 55.7±18.4, 51% were male, stroke was present in 36%, GERD in 9%, and neurodegenerative diseases in 9%. Older age (P<0.01), male sex (P<0.01), stroke (P<0.01) and severity of dysphagia (P<0.01) were independently associated with higher CRT.

Conclusions

Factors more strongly associated with CRT desensitization were male sex, older age, stroke, and severity of dysphagia

(197) Submission ID#479185

Quality of life outcomes following open reconstruction for laryngotracheal stenosis

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: David Young – Vanderbilt University Medical Center, Department of Otolaryngology

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Laryngology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Laryngotracheal stenosis (LTS) is an uncommon but devastating disease. Both the disease and its treatment profoundly affect phonation, respiration, and deglutition and directly impact patient quality of life (QOL). Despite its critical importance to treatment planning, longitudinal data on the direction and degree of change in patient-reported QOL after open repair for LTS is lacking.

Methods
Prospective observational study of multidimensional patient-reported quality of life data (Clinical COPD

questionnaire(CCQ), SF-12, EAT-10, and VHI) from a complex airway clinic over 12 months. 19 patients undergoing open repair (including tracheal resection (TR), cricotracheal resection(CTR), extended cricotracheal resection (exCTR), and laryngotracheal reconstruction (LTR)) were compared with 4 LTS patients managed nonoperatively.

Results

As expected, patients who were decannulated after open reconstruction had a significant improvement in breathing (mean CCQ score decrease of 1.133 points; p=0.02). Swallowing outcomes were initially worse after open reconstruction and increased to baseline with time regardless of surgical outcome (EAT-10 score improved by 50% every 23 days.). Patient reported voice outcomes before and after open reconstruction were not significantly different. Interestingly, the initial SF-12 physical composite scores were significantly higher (mean SF-12 PCS difference 12.11, p=0.03) in patients successfully decannulated. While SF-12 mental composite scores were not significant different pre- and post-surgery in decannulated, tracheostomy-dependent, and control groups.

Conclusions

Successful open reconstruction correlates with significant improvement in patient reported breathing. Deglutitive and phonatory function can be preserved with open reconstruction, even in surgical failures. Preoperative SF-12 physical composite scores were significantly higher in patients successfully decannulated. In LTS, patient reported QOL measures may facilitate risk stratification, promote informed patient decision making, and optimize healthcare resource management.

(198) Submission ID#459489

True vocal fold injury and scar after rigid bronchoscopy, a one year photo story

Submission Type: Case Report

Submission Status: Complete

Submitter: Stephanie Youssef – Mayo Clinic School of Medicine

---

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
True vocal fold (TVF) injuries are a documented complication of endotracheal intubation. However, cases of TVF injury after rigid bronchoscopy are not well reported. Laryngoscopy for visualization of the TVF is utilized for the initial diagnosis of laryngeal injury, but is not typically performed on a frequent basis following injury. Thus, a definitive photographic timeline of TVF healing has not yet been documented. We present the case of a 58 year old female who experienced TVF injury with rigid bronchoscopy during a bronchial stent placement. Regular follow up bronchoscopies for recurrent bronchial stenosis allowed for frequent visualization of her TVF injury and healing.

Case Report
A 58 year old female with a history of bilateral lung transplant for organizing pneumonia, complicated by bronchial stenosis and bronchomalacia, was taken to the operating room for Y stent revision with rigid bronchoscopy. Following rigid bronchoscopy, a full thickness laceration injury was noted to the right TVF, as well as severe laryngeal edema. The patient had subsequent dysphonia, but denied any dysphagia, or aspiration. She was taken to the operative room again several times over the following months for stent revision and bronchoscopy, which allowed for additional visualization of the right TVF as it was healing. Thirteen months following the initial injury, her dysphonia was reassessed and no TVF interventions were planned.

Conclusion

TVF injuries remain a known complication of intubation and prolonged intubation. However, the incidence of TVF injury after rigid bronchoscopy is not well documented. Iatrogenic damage to the TVF can impair post-operative recovery, increase time of hospitalization, and introduce additional life-threatening medical concerns, such as aspiration pneumonia or airway compromise. This case demonstrates frequent visualization of TVF injury during healing. No additional interventions at the TVF were performed, other than immediate post-operative intravenous steroids. Thirteen months following TFV injury, the patients persistent dysphonia was rated as moderately deviant (27/100) using the Consensus Auditory Perceptual Evaluation of Voice (CAPE-V) scale. Video stroboscopy at thirteen months showed that a small mucosal defect and scar remained on the right TVF, which impaired TVF vibratory function. Regular bronchoscopies allowed for photographic documentation of TVF status with objective progression of healing and evolution of scar.

Uploaded File(s)

Image or Table

Figure 1. Endoscopic images of the larynx showing healing evolution of TVF injury. Initial image (July 2016) was taken 3 days after injury was noted intraoperatively and shows full thickness laceration to the right mid- posterior TVF. An obvious defect posteriorly was seen as time went on, especially May 2017 and June 2017. Final image (October 2017) still shows fibrous fullness adjacent to site of initial injury.

(199) Submission ID#477709

A clinical research of autofluorescence in diagnosis of malignant pleural diseases

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Wang Feng – Beijing Chao-yang Hospital,Beijing,China

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Pleural Diseases

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- Yes

Background
Conventional medical thoracoscopy (MT)routinely performed in patients with pleural diseases, does not always give a conclusive diagnosis. The endoscopic appearance of malignant pleural diseases under white light could be misleading. Autofluorescence imaging has been shown to be an interesting and effective diagnostic tool, and in this study we will investigate its use during MT.

Methods
Patients with undiagnosed pleural effusion, who were admitted to our clinical center from 2014.3 to 2017.12, were enrolled. Exclusive criteria included patient with age<18 or >90 years old; multiple pleural adhesions; nonmalignant pleural disease and pregnant woman.MT was performed firstly with conventional white light and followed by autofluorescence imaging. Endoscopic results of different diseases were recorded and the biopsy specimens were obtained for pathological analysis. We calculated the diagnostic sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of the two methods by comparing them to the pathological results.

Results
130 eligible patients were studied, including 71 cases with pleural metastasis of lung cancer, 15 cases with malignant mesothelioma, 3 cases with pleural metastasis of breast cancer, 4 cases with Non-Hodgkin's lymphoma and 3 cases with other metastatic malignant tumors. There were 34 cases with non-malignancy, including 24 cases with tuberculous pleurisy,2 cases with sarcoidosis and 8 cases with non-specific pleuritis. The diagnostic sensitivity, NPV and 95% confidence interval of autofluorescence imaging was 100%97.8%100%and 100%94.0%100%. Autofluorescence imaging was superior over white light, which sensitivity and NPV was 89.3%84.2%93.0% and 77.0%67.3%84.6%. For the specificity and PPV, there was no significant difference.

Conclusions
The advantage of autofluorescence imaging is its high diagnostic sensitivity and NPV. It is useful to detect micro-lesions and delineating the pathological margins. Autofluorescence imaging can benefit some patients with its better visualization.

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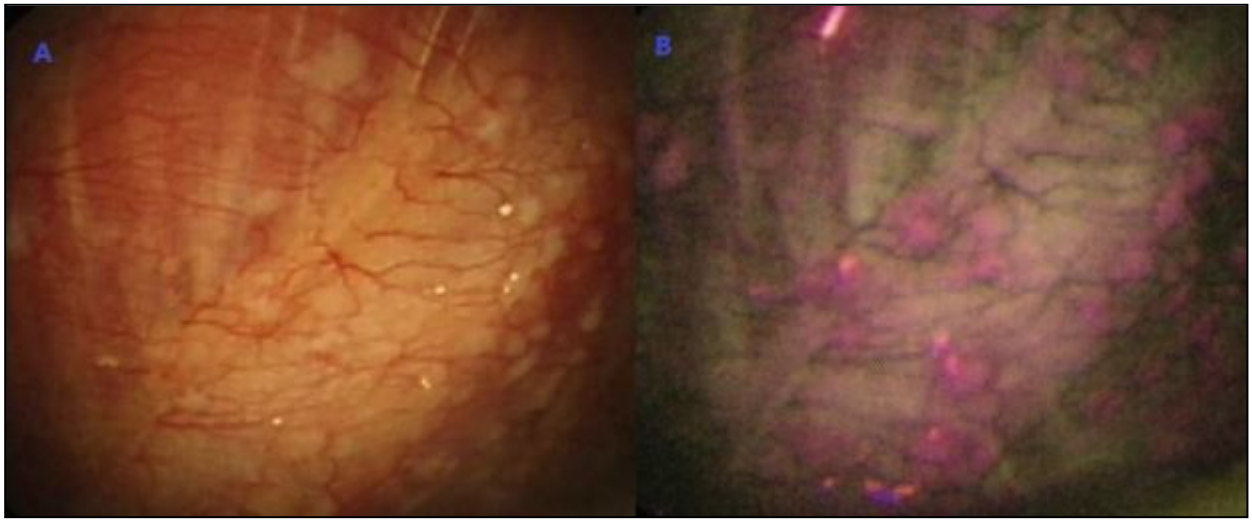

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Poster for WCBIP WCBE World Congress -A Clinical Research of Autofluorescence in Diagnosis of Malignant Pleural Diseases.ppt

(200) Submission ID#458068

A Single Center Experience with Povidone Iodine Pleurodesis

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Lewis Aldred – Division of Pulmonary & Critical Care, University of Mississippi Medical Center

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Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

The earliest data supporting povidone iodine pleurodesis was published in the early 1990s. It has been shown to have success rates varying from 86.5% to 96.1% for all indications. We set out to review our usage of povidone iodine for pleurodesis.

Methods

We performed a retrospective review of consecutive cases of povidone iodine pleurodesis. During the period between January 2017 and December 2017, under one attending, 9 consecutive patients received pleurodesis with povidone iodine. These patients had either recurrent effusions or pneumothoraces. The etiology of the pleural effusions was determined by two physicians using predefined criteria. For those with

recurrent effusions, all but one patient had the povidone-iodine instilled via tunneled pleural catheter; the other patient with recurrent effusion, and the two patients with pneumothoraces had povidone iodine instilled via chest tube. Informed consent to perform the procedure was obtained from every patient.

Results

Of 9 patients, 7 had recurrent pleural effusions and 2 had pneumothoraces. Of the 7 recurrent pleural effusions, 4 were classified as paramalignant effusions, 1 as a malignant effusion, 1 from congestive heart failure, and 1 from constrictive pericarditis. A complete response with no reaccumulation of fluid was obtained in 3 patients (42.8%) with a second procedure being successful in a fourth patient (57%). 1 patient had an initial response, but the fluid recurred, while 2 others had no response. Of the 2 pneumothoraces, both patients had a near-complete response (100%). For all indications, this yielded an overall success rate of 66.7%.

Conclusions

Even with broader inclusion indications, our results are slightly lower, but similar to, previously published success rates of povidone iodine pleurodesis. At our facility, povidone iodine is significantly cheaper than other sclerosing agents. Our review supports that povidone iodine continues to be a reasonable choice as a sclerosant.

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Image or Table

Indication	Cause	Age	Sex	Time to chest tube removal	Success
Recurrent effusion	Constrictive pericarditis	70	M	Died with PleurX	No
Recurrent effusion	Paramalignant	60	F	2 days	Yes, but recurred
Recurrent effusion	Paramalignant	57	M	26 days	Yes
Recurrent effusion	Malignant	70	M	Still with PleurX	No
Recurrent effusion	Paramalignant	43	F	3 days	Yes
Recurrent effusion	CHF	60	F	5 days then 2 days	Yes, after second procedure
Recurrent effusion	Paramalignant	55	M	5 days	Yes
Pneumothorax	Recurrent	71	M	4 days	Yes
Pneumothorax	Secondary spontaneous	46	M	6 days	Yes

(201) Submission ID#458824

Cases of pulmonary tuberculosis in which examinations were required for hospital staff performing fiberoptic bronchoscopy

Submission Type: Case Report

Submission Status: Complete

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Showa University Hospital is a teaching hospital that has no tuberculosis(Tb) but diagnoses Tb in approximately 30 patients per year. Because 80% of these patients have pulmonary Tb, infections can spread to members of the hospital staff. If pulmonary Tb is suggested by the clinical conference, the staff should wear a type N95 particulate respiratory mask. We present cases in which fiberoptic bronchoscopy(BF) was performed before Tb was suspected and in which examinations of the medical staff were required.
BF was performed without Tb prevention measures among patients in whom Tb was diagnosed at our Hospital from April 2010 through November 2017, and cases that required examinations of the medical staff were evaluated.

Case Report
Patients with Tb was 256 (186 had pulmonary Tb). For 28 patients, BF was required for diagnosis. Three of these patients (2 in 2011 and 1 in 2012) were not suspected of having Tb when BF was performed; therefore, the medical staff did not wear N95 masks and were exposed to M. tuberculosis.
Case 1: A 36-year-old woman came to our hospital with antibiotic-refractory bronchopneumonia. BF revealed a white erosion under the vocal cord. In segment B5, the surface of the mucous membrane was reddened and swollen. A biopsy and lavage were performed. The tissue showed multinucleate giant cells and granulation. The polymerase chain reaction(PCR) was consistent with the diagnosis of bronchus Tb. A sputum examination revealed M. tuberculosis. The examination had been performed by an anesthesiologist.
Case 2: A 34-year-old man had been receiving an inhalation corticosteroid(ICS) to treat bronchial asthma(BA) for many years. Coughing and yellow sputum, and shadows in both lungs were observed. Treatment improved symptoms, but the shadows remained. Because organizing pneumonia was suspected, BF was performed. The PCR was positive for M. tuberculosis, and cultured. Medical examination was considered for the

physician who had performed BF and for an assistant.
Case 3: A 60-year-old man with BA had been treated with an ICS. Because chest radiographs showed isolated nodal shadows with pleural indentaion, BF was performed for suspected lung cancer. Tb was rated with a brush sample as Gaffky 7. Examinations were performed as Case2.

Conclusion
We had held a short conference before performing BF, since 2013 we have held a conference for on the day before the examination. We also perform the interferon-gamma release assay for suspected cases of Tb. Because of these changes, fewer cases of Tb are overlooked.

(202) Submission ID#458653

Intrapleural tissue plasminogen activator and deoxyribonuclease therapy versus Early Medical Thoracoscopy for Treatment of Pleural Infection: A Randomized Clinical Trial

Submission Type: Oral and Poster

Submission Status: Complete

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Pleural Diseases

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Background
Pleural infection is a frequent clinical diagnoses encountered in clinical practice associated with high morbidity and mortality. There is limited evidence regarding the optimal treatment of this condition especially in complicated effusions with septa. Although both early medical thoracoscopy (MT) and tube thoracostomy with intrapleural instillation of tissue plasminogen activator (tPA) and human recombinant deoxyribonuclease (DNase) are acceptable treatment for patients with complicated pleural infection, there is a lack of comparative data between these modes of management. The aim of this study is to compare the safety and efficacy of early MT versus intrapleural (tPA/DNase) in patients with complicated pleural infection.

Methods
Interim analysis of a prospective multicenter randomized control trial of patients with pleural infection and evidence of septated pleural effusion on pleural ultrasonography and/or chest computed tomography scan who underwent MT or chest thoracostomy with instillation of tPA/DNase. The primary outcome was the length of hospital stay following either intervention. Secondary outcomes included treatment success, number of days of chest tube drainage, cost and adverse events.

Results
A total of 12 patients with pleural infection were included so far: 6 in each group (Table 1). In the tPA/DNase

group: the median length of hospital stay following intervention was 5 (range, 5- 8), the median number of doses of tPA/DNase was 5 (range, 2-6), median chest drainage days was 4 (range, 2- 7), therapy was successful in 66.6% (4/6) with 2 patients requiring insertion of additional chest tubes. In the MT group: the median length of hospital stay following intervention was 2 (range, 2-13), median chest drainage days was 2 (range, 1-3), therapy was successful in 83.3% (5/6) with 1 patient requiring a single dose of tPA/DNase. In both groups, there was neither pleural bleeding that required transfusion nor mortality related to pleural infection. The overall cost of MT was 9,700$ while the cost of 5 doses of tPA/DNase was 15,000$.

Conclusions

This interim analysis showed that early MT decreased length of hospital stay and overall cost following intervention as compared to tPA/DNase therapy in patients with complicated pleural infection.

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Image or Table

Table 1-Baseline Characteristics and clinical outcomes

	t-PA/DNase (N = 6)	Medical Thoracoscopy (N = 6)
Characteristics		
Age (Year)		
Median (range)	52.5 (29-75)	68.5 (61-75)
Men N (%)	5 (83.3%)	6 (100%)
Community acquired infection N (%)	4 (66.6%)	2 (33.3%)
Positive Gram's stain or culture of pleural fluid N (%)	3 (50%)	4 (66.6%)
Lactate Dehydrogenase in pleural fluid (Units/L)		
Median (range)	920.5 (267-3392)	667 (267-1819)
Glucose in pleural fluid (mg/dl)		
Median (range)	48.5 (2-150)	32.5 (8-133)
Outcomes		
Length of hospital stay following intervention days		
Median (range)	5 (5-8)	2 (2-13)
Chest tube drainage days		
Median (range)	4 (2-7)	2 (1-3)
Cost $	15,000	9,700
Therapeutic Success* N (%)	4 (66.6%)	5 (83.3)

*Therapeutic success defined as no additional chest tube or surgery in t-PA/DNase group; and no additional chest tube, fibrinolytic therapy or surgery in Medical Thoracoscopy group.

Powerpoint Upload

Intrapleural tissue plasminogen activator and deoxyribonuclease therapy.pptx

(203) Submission ID#459701

Management of recurrent bilateral spontaneous pneumothorax in Birt-Hogg-Dubé syndrome with indwelling pleural catheter for home care setting

Submission Type: Case Report

Submission Status: Complete

Submitter: Sita Andarini – Department of Pulmonology and Respiratory Medicine, Faculty of Medicine University of Indonesia Persahabatan Hospital, Jakarta Indonesia

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Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Spontaneous pneumothorax is the most common complication of Birt-Hogg-Dubé (BHD) syndrome, a rare autosomal dominant disorder that mainly affects lung. The etiology of BHD syndrome has been elucidated as germline mutation in folliculin (FLCN) gene resulting multiple cysts formation mostly in lung. Prolonged hospitalization due to secondary spontaneous pneumothorax in BHD syndrome will reduce quality of life of the patients, and risk of hospital infection. Indwelling pleural catheter (IPC) has been widely used in palliative management of malignant pleural effusion (MPE) as home care setting. Based on our experience, IPC insertion for palliative home management of MPE can be used as the same scenario for secondary pneumothorax in multiple cysts lung disease.

Case Report
A 52-year old female was diagnosed as BHD syndrome with large multiple cysts, as mentioned in our earlier study, came to our hospital with acute shortness of breath, chest pain and lost of consciousness. An emergency thoracentesis was done as life-saving procedure. After her condition improved, a chest computed tomography (CT)-scan was done, showed bilateral pneumothorax over multiple cysts on both lung. We IPC on her left and right chest, connected with portable suctioning device until her general condition was improving. She was discharged with IPC and portable pleural suctioning device. After several weeks, the pneumothorax were diminished, suctioning device were changed into Heimlich valve, and bilateral indwelling pleural catheters were removed.

Conclusion
In the management of spontaneous pneumothorax due to chronic cysts lung disease such as BHD syndrome, IPC might give benefit for long term, home care management of spontaneous pneumothorax.

(204) Submission ID#463039

Marijuana induced pleural effusion

Submission Type: Case Report

Submission Status: Complete

Submitter: Ayal Romem – University of Cincinnati Medical Center

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Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Marijuana is the most widely used illegal drug in the world and the second most commonly smoked substance after tobacco. Its health effects on the respiratory system have been extensively reviewed in the literature. Nevertheless we hereby, to the best of our knowledge, present the first description of marijuana induced eosinophilic pleural effusion.

Case Report
A 39 year old male with a medical history of childhood asthma presented to the hospital with shortness of breath of one month duration, associated with non-productive cough and a pressure-like left sided chest pain. There was no history of fever, chills, night sweats, weight loss, recent infection or rash. The social history was significant for marijuana smoking. Patient denied any tobacco use and did not have any exposure to inhalational toxins.On admission patient was in no apparent distress; vital signs were within normal limits. Physical examination was positive for diminished breath sounds and dullness to percussion over the lower left lung field. Diagnostic workup revealed relative eosinophilia (10%; 620uL); chest x-ray showed a moderate left pleural effusion. An ultrasound guided thoracentesis was performed with removal of 1500ml orange cloudy fluid. Fluid analysis was consistent was an eosinophilic exudate (protein-5.2g/dl, LDH- 974u/L, cholesterol-91mg/dl, eosinophils-64%).Cytology was benign and all cultures were sterile. Patient was discharged home on levofloxacin and strongly advised to quit marijuana use. On a follow up visit the pleural effusion persisted and a decision was made to proceed with a medical thoracoscopy. Visual inspection of the pleural cavity revealed mild inflammatory changes; 600ml of fluid were evacuated and multiple parietal pleural biopsies were sent for microbiology and pathology processing. Pathology results showed pleural tissue with patchy lymphocytic and eosinophil infiltrates, focal fibrin, fibrosis, and reactive mesothelial cells; negative for malignancy. Prior to discharge the patient was again encouraged to avoid any further marijuana exposure. On a six week follow up visit, at which time the patient denied any marijuana use, a repeat chest x-ray showed resolution of the pleural effusion and the patient was free of symptoms.

Conclusion
As marijuana use becomes increasingly prevalent, pulmonary physicians should be aware of its diverse harmful effects on the respiratory system. Prior reports have described the association between marijuana exposure and eosinophilic pneumonia. Hereby we describe the first case of marijuana induced eosinophilic pleural effusion, highlighting the importance of obtaining a thorough exposure history and of critical evaluation of the pleural fluid analysis in light of this exposure.

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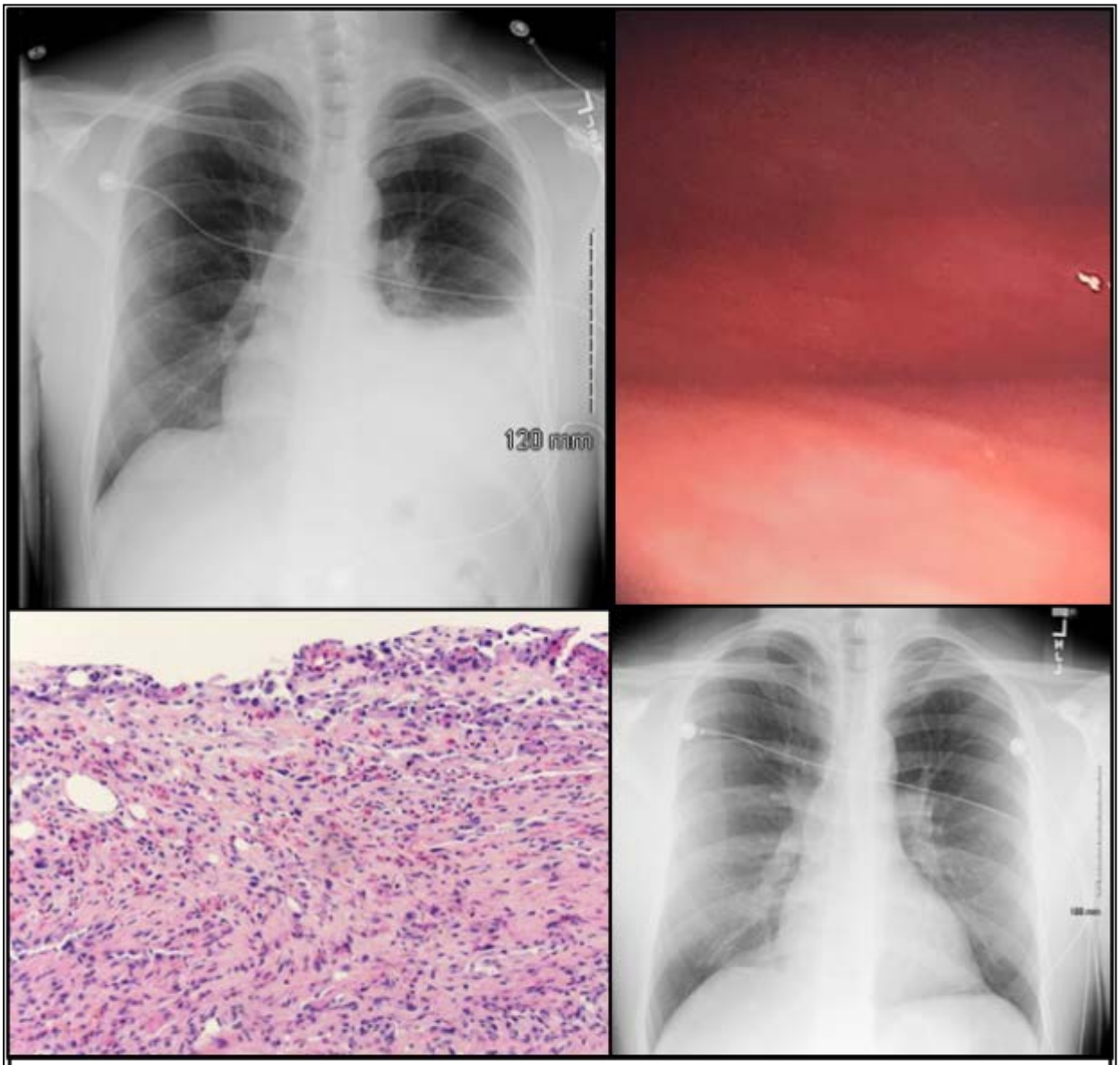

(a) Chest x-ray on initial presentation. (b) Medical thoracospy macroscopic view of the parietal pleura (c) Parietal pleural biopsy showing patchy lymphocytic and eosinophil infiltrates(d) resolution of pleural effusion after discontinuation of marijuana exposure.

(205) Submission ID#478061

Papillary carcinoma of thyroid presenting as massive pleural effusion

Submission Type: Case Report

Submission Status: Complete

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Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Papillary thyroid carcinoma is typically an indolent disease characterized by slow growth and a favourable prognosis. Papillary thyroid carcinoma accounts for 80%-90% of all thyroid cancers. Papillary thyroid carcinoma usually metastasis to neck nodes, bone and lungs, but rarely metastasis to pleura. It is found only in 0.6% of patients in a large case series. We present a case report of one of our patient presented with malignant pleural effusion from papillary carcinoma thyroid.

Case Report
A 65 year old female presented to the casualty with complaints of breathlessness, dry cough for past 4 months and pain in epigastric region for past 2 days with history of loss of appetite and weight. On examination she was pale.with single firm posterior cervical node which was mobile and non tender .Examination of her neck showed another swelling of size 3*3 cm which was hard in consistency with no tenderness. Respiratory system examination showed stony dullness in left hemithorax with diminished breath sounds in all areas of the chest.Routine blood investigations were normal. The Chest x-ray showed massive pleural effusion with mediastinal shift . 2D echo was normal. Diagnostic and therapeutic thoracocentesis was done .As the pleural fluid reports were inconclusive patient was posted for medical thoracoscopy.Thoracoscopy showed grouped micronodules and multiple randomly distributed nodules seen more on the anterior costal pleura. Diaphragmatic pleura showed large junk of papillary growth . Multiple nodules seen over visceral pleura and large hemorragic nodule noted on the wall of descending aorta. Brush cytology and biopsy was taken from the above mentioned lesion which showed tumour cells arranged in three dimensional clusters and papillary pattern suggestive of Metastatic pleural involvement probably papillary carcinoma of thyroid which was confirmed by immunohistochemistry .FNAC from the thyroid nodule and neck node showed similar histological pattern.Thoracoscopic pleurodesis was performed as a palliative measure .since the patient had poor functional status, chemotherapy was deferred.

Conclusion
Malignant pleural effusion from papillary carcinoma is rare even in the background of thyroid malignancy. There is no proper treatment recommendation due to sparse clinical literature .

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(206) Submission ID#459312

Plasma and Exhaled Alveolar Breath Condensate microRNAs as early biomarkers of asbestos related respiratory diseases in industrial areas: (ARRDIA) a study protocol for a prospective biologically enriched observational trial

Submission Type: Oral Presentation ONLY

Submission Status: Complete

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Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Malignant pleural mesothelioma (MPM) and non-small cell lung cancer (NSCLC) are aggressive neoplasms related to asbestos exposure and refractory to current therapies in advanced stages. Current screening methods are invasive and still lead to a high percentage of false positives. Therefore, a need to find biomarkers that increase the probability of detecting MPM and NSCLC early is mandatory. MicroRNAs (miRNAs) have been implicated in several diseases and cancers. They also appeared stable molecules in blood plasma and exhaled alveolar breath condensate (EABC). The aim of ARRDIA study is to verify whether miRNAs may be useful biomarkers for the early diagnosis of pleural-pulmonary diseases in asbestos exposed patients of industrial areas.

Methods
The prospective, observational, biologically enriched, clinical study, ARRDIA, is currently restricted to Sardinia (Italy), where five industrial areas with increased asbestos pollution were selected. Patient recruitment starts in April 2018 and is expected to end in October 2021. Subjects included are (1) patients with ascertained asbestos exposure according to World Health Organization alert limits and (2) healthy not-exposed patients without neoplasms or severe chronic diseases, distributed in equal samples size (200 subjects per group). Therefore, three additional groups for miRNA validation are included: (3) MPM (4) NSCLC and (5) interstitial lung disease (ILD) new diagnosis patients, waiting for treatments. Validation groups sizes are estimated according to the incidence of each specific pathology. In groups 1 and 2 plasma and EABC samples are collected and processed for miRNAs extraction with Next Generation Sequencing, every 6 months up to the end of the study. In the other groups a single samples collection is mandatory to avoid possible bias related to medical treatments after diagnosis. Receiver operator characteristic (ROC) curves will be used to evaluate the value of plasma and EABC miRNAs in diagnosing asbestosis, MPM, NSCLC and ILD.

Results
Preliminary results will be available at the end of May 2018. Main results are expected in 2022.

Conclusions

Although promising results have been reported, there have been only few trials with small series describing miRNAs as sensible first-line screening test in high-risk subjects. By our knowledge, ARRDIA appears to be the first study focused on asbestos exposed subjects in industrial areas aiming to new miRNA deregulated profiles identification through a novel sampling method with exhaled alveolar breath condensate.

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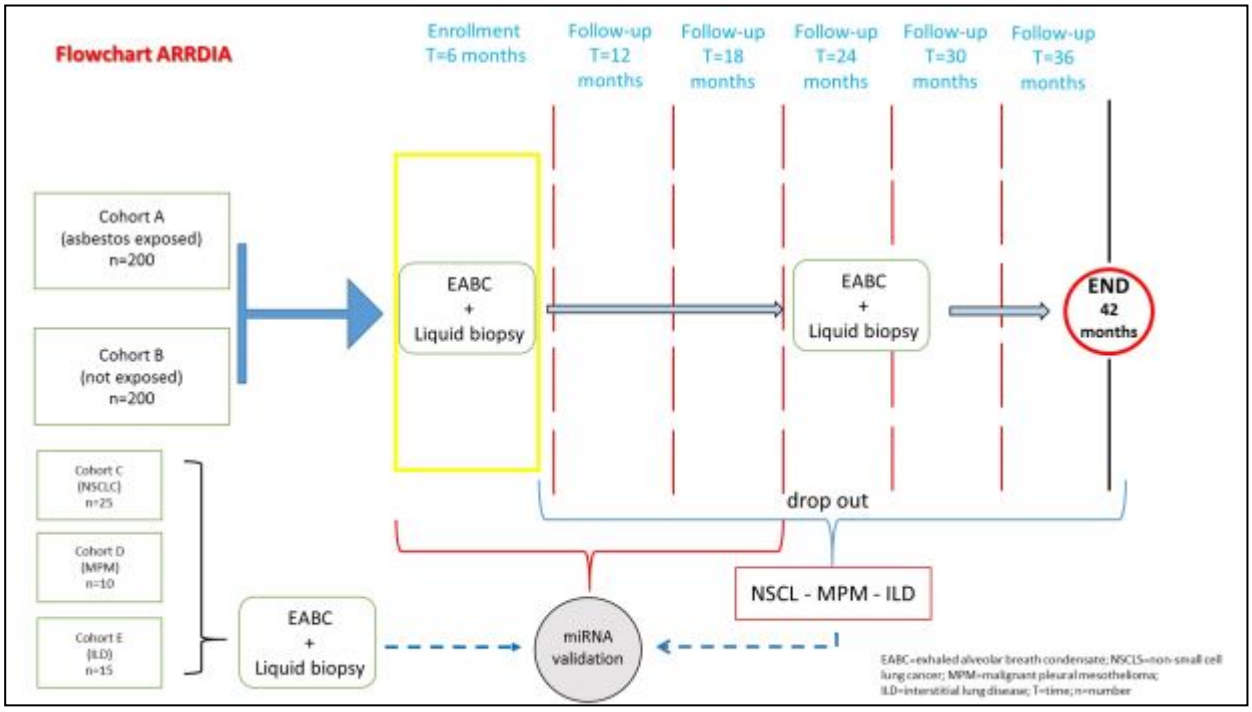

(207) Submission ID#459020

Pleural manometry during simulation of lung expansion

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Tajalli Saghaie – University of Sydney

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Disclosure Status: Complete
Disclosure: Nothing to Disclose
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No financial relationships or conflicts of interest.

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Role: Co-Author

Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Medical pleuroscopy is used to investigate undiagnosed pleural effusions. Pleural effusions may be managed using talc pleurodesis to obliterate the pleural space and prevent recurrence. Pleurodesis will fail if there is incomplete lung expansion therefore the ability to predict lung expansion is essential. There is limited data regarding predictors of lung expansion however, a technique to predict the likelihood of lung expansion has been described. This technique involves simulation of lung expansion by applying negative pressure to the pleural space at the end of medical pleuroscopy and visually assessing for lung expansion. We aimed to demonstrate whether changes in intrapleural pressure using this technique respond differently in expandable and non-expandable lung.

Methods

Patients undergoing diagnostic medical pleuroscopy for exudative pleural effusions were recruited.. At the end of the procedure a 1.8mm catheter was introduced into the pleural cavity via the semi-rigid pleuroscopes

working channel (Olympus LTF-160). The catheter was attached to a pressure transducer, the pleural space was sealed and a pressure of -50mmHg was applied via wall suction. Intrapleural pressure was recorded continuously with the catheter in the pleural cavity. Lung expansion was assessed visually and by the rate of change in pleural pressure between two time points: 1) when suction was applied to when suction was released, 2) when suction was released to when the seal was broken.

Results

A total of six patients (4 male) were recruited; 4 expandable and 2 non-expandable lungs were visualized while negative pressure was applied. The slope of decline in pleural pressure was steeper during both time points in expandable and non-expandable lung.

Conclusions

Preliminary results suggests the rate of change in pleural pressure differs in expandable compared to non-expandable lung. This could validate the use of lung expansion simulation and visual assessment during pleuroscopy as a predictor of talc pleurodesis success.

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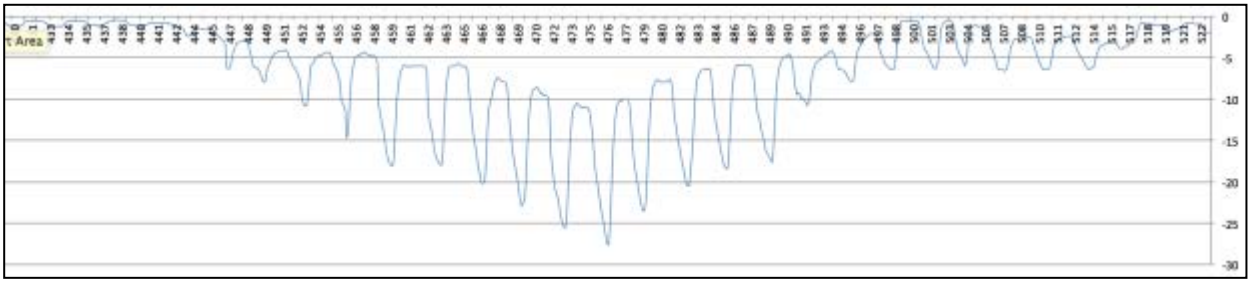

(208) Submission ID#462129

Pleuroscopy on Young Male Patient with Pleural Mycosis (A Case Report from Persahabatan Hospital, Jakarta Indonesia)

Submission Type: Case Report

Submission Status: Complete

Submitter: Prasenohadi Pradono – Department of Pulmonology and Respiratory Medicine, Universitas Indonesia, Persahabatan Hospital

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No financial relationships or conflicts of interest.

Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

There have been a number of recent reports showing an increase in the incidence of pleural infection. The development of a pleural infection can be divided into three stages: (1) exudative stage, (2) fibropurulent stage, and organization stage. Radiologic tests are vital in the initial diagnosis and man-agement of pleural infection, such as chest radiography, CT, and ultrasonography. Pleural mycosis is a rare entity, with most of the cases occurring on a background of lung disease or surgery. Fungal disease accounts for less than 1% of all pleural effusions. The most common preceding conditions are preexisting tuberculosis, bronchopulmonary fistulas, pleural drainage, and lung resection. Here, we report pleural mycosis occurring in a young male, with prior treated with antituberculosis drugs.

Case Report

We report a case of a male 27yearold with dyspnea, fever, and productive cough of 3 weeks duration. Patient also a smoker with 1 pack a day for 10 years. Patient had previously treated with antituberculosis drugs 2 years before admission. A chest radiograph revealed features of the right hydropneumothorax with right

pleural based homogenous shadow in middle and lower zones with obliteration of right costophrenic angle. Aspiration of pleural fluid revealed frank pus and followed by performing chest tube drainage. Due to persistence of empyema, the patient was subjected to bronchoscopy and pleuroscopy. Bronchoscopy finding showed partly compression of right upper lobe, middle lobe, and right lower lobe. Pleuroscopic finding showed widely fibrotic tissue that covered almost the surface of right lung. Pleural fluid culture showed a few colonies of Candida albicans that sensitive with amphotericine B, fluconazole, itraconazole, ketoconazole, and coriconazole. Pleural biopsy was performed and showed colony of fungal hyphae with acute and chronic inflammatory process, consistence with Aspergillosis

Conclusion

The incidence of fungal empyema thoracis as well as pyopneumothorax has been rare. The diagnosis of pleural mycosis was made from pleural specimens either from pleural fluid or pleural biopsy. Performing invasive techniques such as bronchoscopy and pleuroscopy were use to increase the specificity of etiology, especially in pleural mycosis.

(209) Submission ID#459606

Reexpansion pulmonary edema a lesson to learn

Submission Type: Case Report

Submission Status: Complete

Submitter: Abdul Alraiyes – Rosalind Franklin University

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Disclosure:
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Disclosure: Nothing to Disclose
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No financial relationships or conflicts of interest.

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Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Pulmonary reexpansion edema (PRE) may be considered as iatrogenic complication following drainage of pleural effusion or pneumothorax. Reexpansion pulmonary edema is a rare but life-threatening clinical condition, the reported incidence has been 1% with mortality can be up to 20%.

Case Report

A 51-year-old woman transferred to intensive care unit (ICU) with sudden onset of shortness of breath and increased oxygen demands. The patient had a history of stage IV colon cancer mediatized to the liver with large ascites and right pleural effusion. The patient received multiple chemotherapy regimens. Despite all treatments the cancer progressed with massive liver metastasis.

She was admitted 3 days prior to ICU transfer with hyponatremia, acute kidney injury and altered mental status with the suspicion of hepatorenal syndrome. Due to the large pleural effusion right-sided indwelling

pleural catheter (IPC) placed and 500 ml pleural effusion drained. Following the placement of the right IPC a chest radiograph were performed and demonstrated a loculated right pleural effusion with IPC in place.
A day later the patient continue to have dyspnea at rest. Another drainage performed and 1400 ml pleural fluids removed using the negative pressure bottles. The drainage had to be interrupted because of severe chest pain. Immediately after draining the pleural effusion the patient started coughing pinkish frothy sputum and became significantly short of breath. On physical examination there was sinus tachycardia of a heart rate of 120 bpm with normal blood pressure and her arterial oxygen saturation dropped to 85% on room air, which then maintained above 90% with high flow oxygen through nasal cannula. Chest auscultation revealed diffuse crackles on the right upper zone with decreased breath sounds on the base. Another chest radiograph performed at the ICU and which demonstrated diffuse airspace disease with pleural effusion on the right side. A CT chest confirmed the findings of unilateral right airspace disease with large pleural effusion.

Conclusion

Early recognition of pulmonary reexpansion edema is very critical. The diagnosis based on the clinical presentation rather than radiographic images. The clinical signs and symptoms are chest pain, persistent cough, production of frothy sputum and dyspnea, tachypnea, hypoxemia, tachycardia, and crackles on auscultation.
PRE risk factors are rapidity of fluid or air drainage, large pleural effusion or pneumothorax, young patients, amount of negative pressure generated and specific malignant pleural effusions.
PRE treatment is supportive with positioning the patient on the non-affected side, non-invasive ventilation (NIV), diuresis and vasopressor support.

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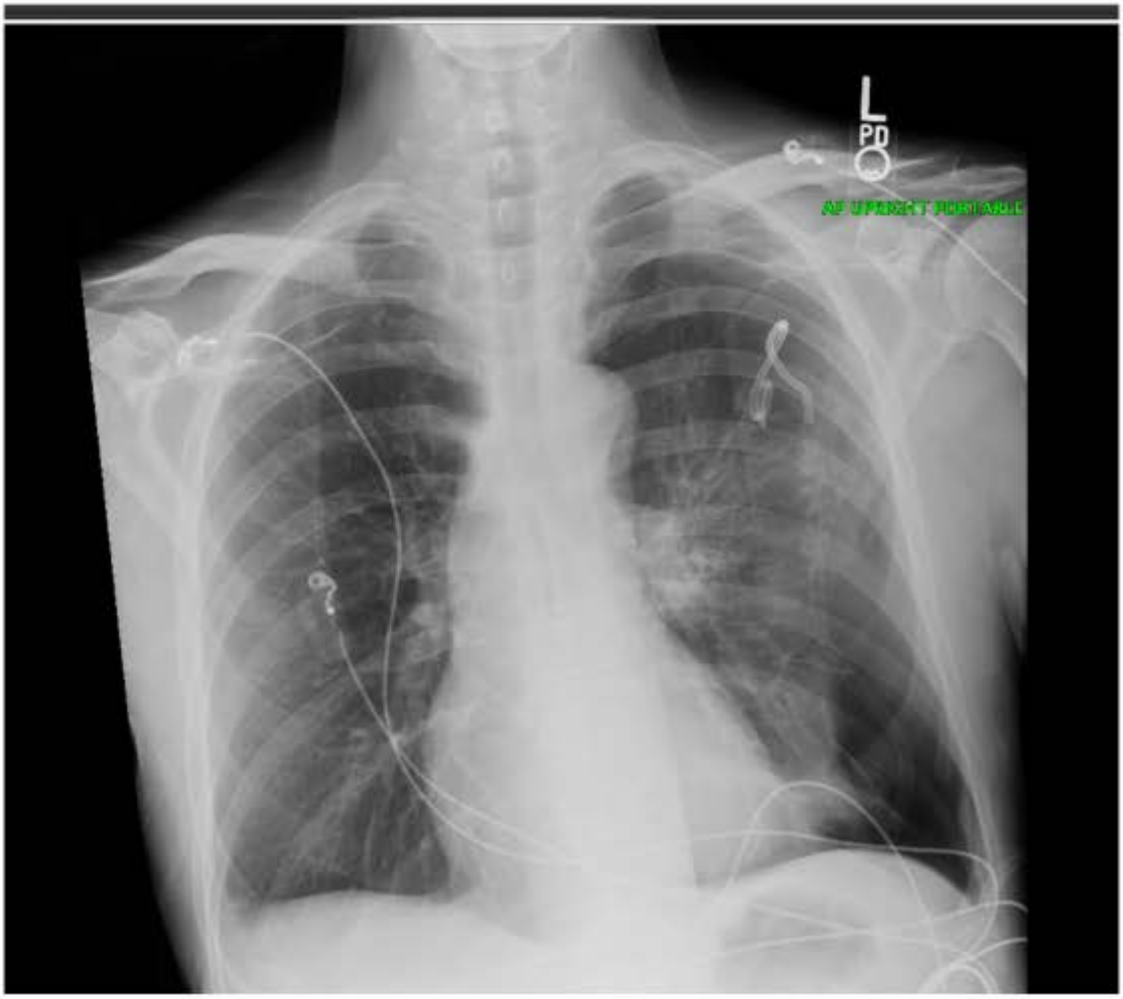
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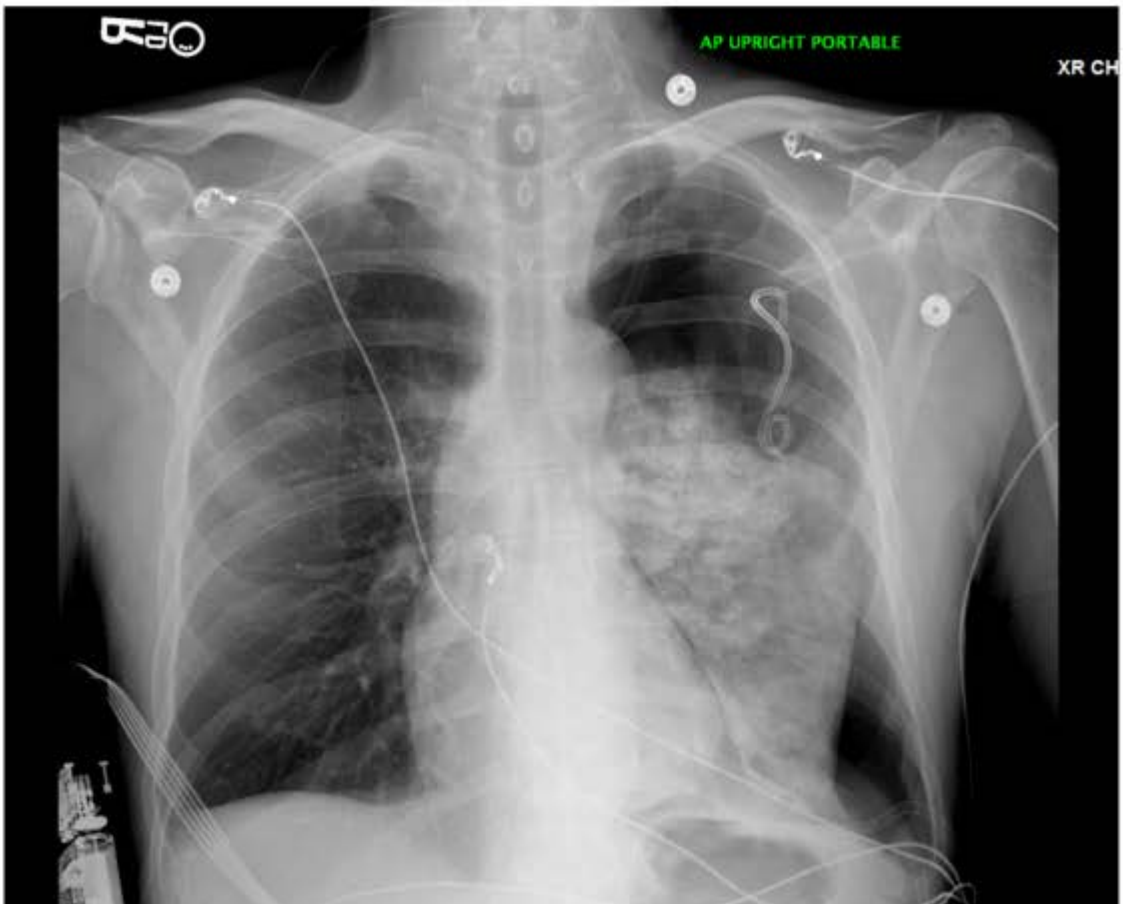
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(210) Submission ID#478084

Spontaneous hemothorax in Papillary Adenocarcinoma of Lung

Submission Type: Case Report

Submission Status: Complete

Submitter: Yuvarajan Sivagnaname – Sri Manakula Vinayagar Medical College& Hospital,Puducherry

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Disclosure: Nothing to Disclose
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No financial relationships or conflicts of interest.

Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Hemothorax is defined as when packed cell volume of pleural fluid > 50% of peripheral blood or RBC of pleural fluid > 50% of peripheral blood. Isolated hemothorax occurs in Metastatic malignant pleural disease, Schwanommas and anticoagulant use .Lung malignancy usually causes hemorrahagic effusions whereas frank hemothorax is very rare.we are reporting a case of papilary adenocarcinoma of lung presenting as massive hemothorax

Case Report
34year old female came with complaints of dry cough , breathlessness for 1 month and right sided shoulder pain for 1 day. On auscultation, absent breath sounds on right hemithorax in all areas with stony dull note on percussion. Chest x ray revealed homogenous opacity in right hemithorax with mediastinal shift to opposite side.USG thorax suggested multiple homogenous internal echoes with underlying collapsed lung.50 ml of frank bloody pleural fluid was aspirated and analysed. Pleural fluid packed cell volume was more than 50% of peripheral blood which was diagnostic of hemothorax. CECT THORAX showed gross right sided effusion and 4.9*1.5 cm oval irregular enhancing lesion in right middle lobe with near total collapse of middle and lower lobe along with multiple non-necrotic lymph node noted in mediastinum. Around 2000ml of hemorrhagic

pleural fluid drained through medical thoracoscope. Costal, mediastinal, and diaphragmatic pleura were studded with multiple nodules. Pleural biopsy was taken, reported as epitheloid variant of papillary mesothelioma/ papillary adenocarcinoma. Immunohistochemical study TTF-1, PANCYTOKERATIN , CK-7-positive. CALRETININ-were negative. Post thoracoscopy Hb dropped , hence blood tranfusion was given. Post thoracoscopy drain was 5630ml over 15 days duration. Following this pleurodesis with doxycycline 10mg/kg via chest tube done as a palliative measure.EGFR and ALK mutation analysis were done which were reported as negative.Patient was then refered to oncology unit for chemotherapy.

Conclusion

Hemorrahagic pleural effusion is the common manifestation of metastatic pleural disease.however,spontaneous hemothorax may rarely occur in bronchogenic carcinoma with metastasis which carries poor prognosis.

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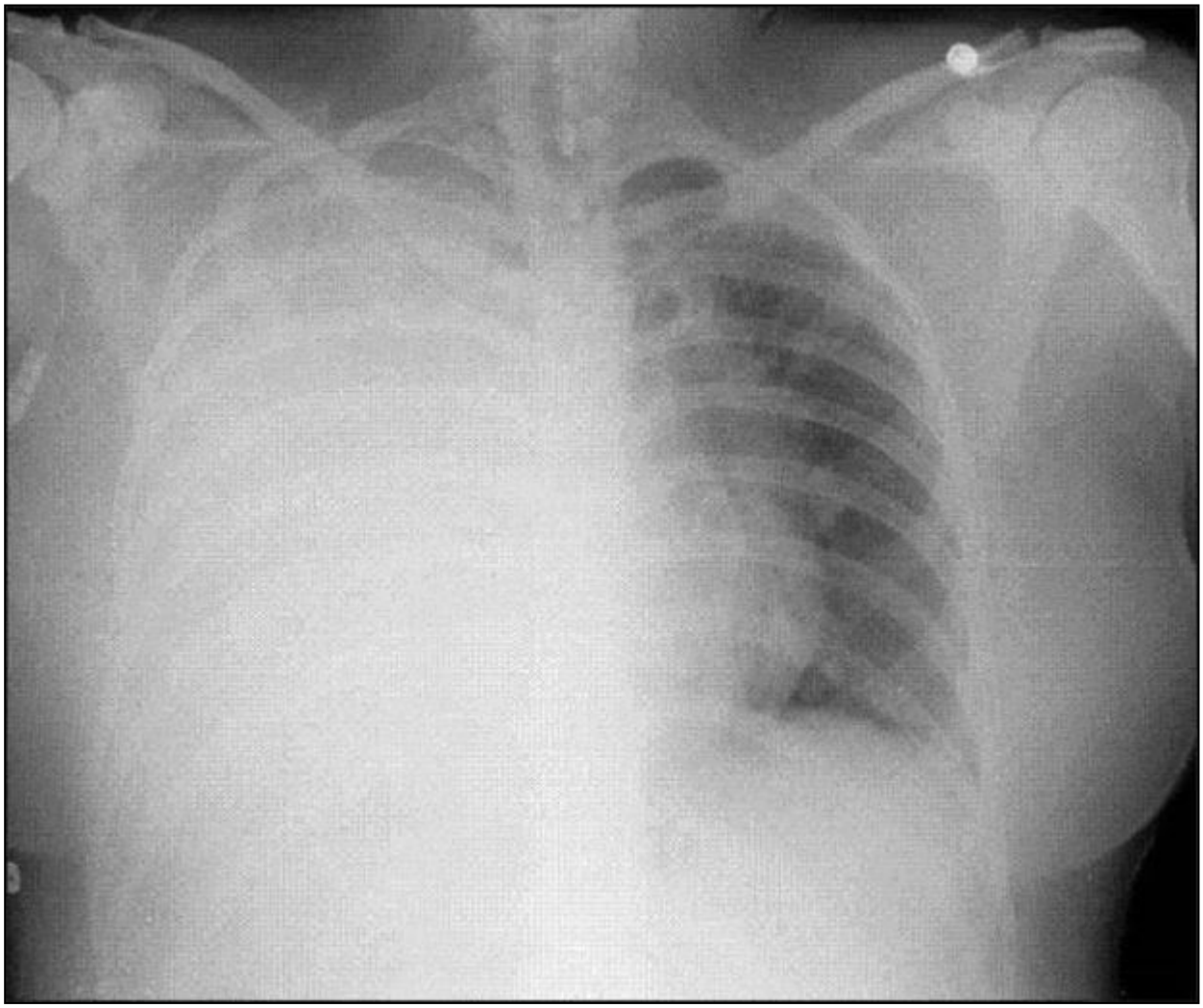

(211) Submission ID#459732

Successful blood patch pleurodesis in a patient with persistent air induced by intrapleural lytic administration post lung resection

Submission Type: Case Report
Submission Status: Complete
Submitter: James Williams – University of Mississippi Medical Center

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Pleural Diseases

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Complications arising from pneumonia include the development of complicated pleural effusions, possibly requiring surgical intervention. Persistent air leaks are among the most common complications of surgical lung resections, reported around 50%1. Alternatively, intrapleural lytic therapy reduces the need for surgical intervention in cases of complicated pleural effusions related to lung infections2. Autologous blood patch pleurodesis (ABPP) is a feasible and safe method to achieve pleurodesis for persistent air leak 3. We describe a case of persistent air leak secondary to an iatrogenic cause resolved with ABPP.

Case Report

A 21 year old female was admitted to the hospital with respiratory distress. Initial imaging and cultures were significant for bilateral methicillin resistant staphylococcus pneumonia complicated by bilateral pleural effusions. She was treated with antibiotics and later required bilateral thoracotomy with necrotic lung resection. She was discharged on prolonged therapy with oral Linezolid. One month later, she re-presented with new onset of seizures and sepsis. CT thorax showed patchy multifocal infiltrates and loculated left hydro-pneumothorax. Cardiothoracic surgery recommended chest tube placement, and intrapleural tissue Plasminogen Activator/Dornase Alpha.
A significant air leak and worsening of the pneumothorax was noted shortly after intrapleural lytic instillation, which persisted despite increased suction. Due to previous thoracotomy, surgery recommended a conservative approach. ABPP was performed as noted in figure 1 while patient remained mechanically ventilated. Pleurodesis was complicated by subcutaneous emphysema from chest tube occlusion. This eventually resolved over next few days, however the air leak persisted. Patient underwent bronchoscopy with transbronchial cryobiopsy and was diagnosed with drug induced eosinophilic syndrome. Upon discontinuation of possible offending agents, respiratory function improved, allowing successful extubation. ABPP was reattempted as previously described with successful closure of air leak, and chest tube removal after 72 hours. Serial chest imaging showed no recurrence of the pneumothorax. Patient was discharged home and has continued to do well.

Conclusion

Autologous blood patch pleurodesis appears a safe and effective method to achieve pleurodesis. There are no clinical trials comparing this method to other commonly used chemical agents. This is the first case report of successful ABPP used in the setting of the persistent air leak from an iatrogenic pneumothorax caused by intrapleural lytic administration used to treat complicated pleural space post lung resection. Authors suggest that ABPP should be considered as an alternative method of pleurodesis in the selected patient population, however more clinical trials are needed to evaluate its safety and efficiency.

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Image or Table

Figure 1: (A) CT scan demonstrating left loculated hydropneumothorax. (B,C) Blood patch pleurodesis procedure shown as performed. At the bedside, under sterile conditions, 100cc of blood was drawn from an arterial stick and injected into the chest tube, followed by a 30cc normal saline flush. The chest tube was elevated to 50cm above the patient and was placed on a water seal. Patient was rotated to left and right lateral decubitus position every 30 minutes for a total of two hours.

(212) Submission ID#459544

An approach to manage pleural empyema in children with the combination of medical thoracoscope and rigid bronchoscopic opical biopsy forceps

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Man Gao – The first hospital of Jilin University

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Disclosure Status: Complete

Disclosure: Nothing to Disclose

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No financial relationships or conflicts of interest.

Thoracic Surgery

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Pediatric pleural empyema keeps increasing in incidence and continues to be one source of morbidity in children. Treatments of pleural empyema consist of intravenous antibiotics, pleural chest drainage(with or without intrapleural fibrinolytics), and additional surgical interventions. Currently, medical thoracoscopy is often used to treat this disease in some inventional pulmonology centers. This report aims to present the authors' experience on the combination of medical thoracoscope and rigid bronchoscopic opical biopsy forceps in the management of pleural empyema.

Methods
From April 2017 to February 2018, totally 15 children were diagnosed as pleural empyema in the authors department. All the 15 children had ahead been treated with intravenous antibiotics, pleural chest drainage (with intrapleural fibrinolytics), however, there was no increase in the symptoms and X-ray images. 5 children with a diagnosis of pleural empyema were treated by means of medical thoracoscopy only, and another 10 children were treated with medical thoracoscopy and opical biopsy forceps of rigid bronchoscope together. Thoracoscopic cleaning and drainage of the pleural cavity was performed for all the patients.

Results
Very good results were obtained for all the patients. Emptying of the pleural cavity and full lung decompression were achieved in all cases. There were no intra- or postoperative major complications. In the combination group, the duration of operation and lung decompression is shorter comparing with the medical thoracoscope group.

Conclusions
Compared with biopsy forceps of medical thoracoscope, the optical biopsy forceps of rigid bronchocope can open wider and grab so powerfully that it can provides more effectvely cleaning of the empyema chambers. The Combination of medical thoracoscopy and the optical biopsy forceps established an efficient drainage system for pleural empyema, in addition, this method is minimally invasive, and risk for complication is comparable with that for classical thorax drainage.

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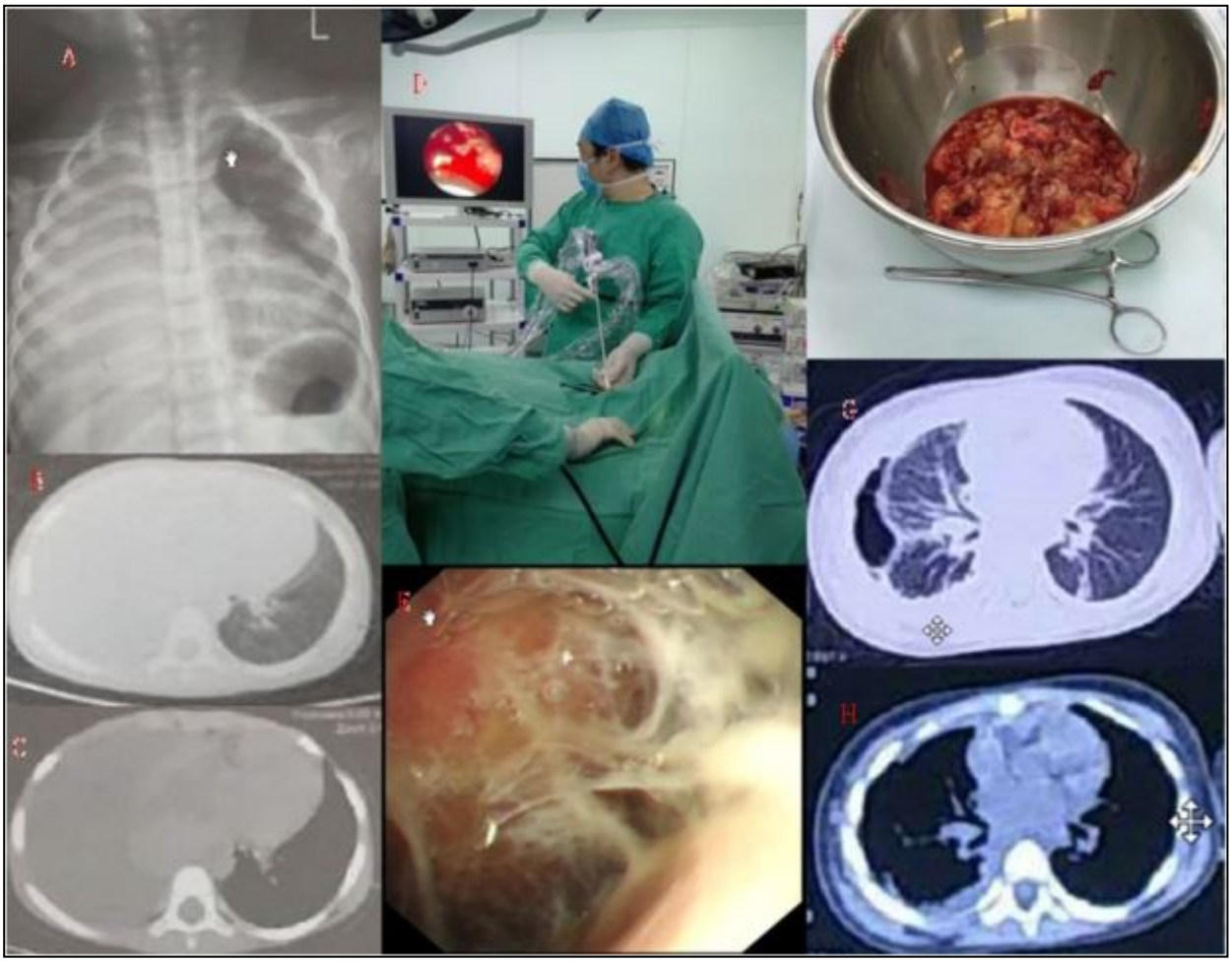

(213) Submission ID#464678

Awake uniportal VATS lung biopsy in non-intubated patients: feasibility and results in the diagnosis of undetermined interstitial lung disease

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Paolo Albino Ferrari – "A. Businco" Cancer Center - Azienda Ospedaliera Brotzu - Cagliari - Italy

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Thoracic Surgery

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Surgical lung biopsy (SLB) in cases of interstitial lung disease (ILD) is still traditionally performed through video-assisted thoracic surgery (VATS) and general anesthesia (GA), associated with not negligible mortality and morbidity rates as well as difficult anesthesia management in those patients with significant risk factors and respiratory failure. Based on these considerations, our center proposed to standardize a safe non-intubated VATS approach for SLB in patients affected by undetermined ILD.

Methods

Fifty awake uniportal VATS lung biopsies were performed under local anesthetic techniques, with or without consciousness sedation, in spontaneously breathing patients. Primary outcomes were technical feasibility, post-surgery complications and mortality within 30 days. We also considered as secondary outcomes the operative time of surgery and operating room (OR) stay, post-surgery length of stay (pLOS), prolonged air leaks, 90-days acute lung disease exacerbation, diagnostic yield and patient numeric rating scale (NRS) of pain after surgery.

Results

Descriptive statistics (Table 1) analyzed primary results and outcomes. All the procedures have been carried out with uniportal VATS technique and sedation, without conversion to GA. Mean pLOS was 1.26 days without prolonged air leaks evidence. There was no post-operative mortality within 30-days. Analgesia methods resulted in optimal feasibility with a mean NRS score of 1.02. The mean OR stay and operative time were 49.56 minutes and 90.80 minutes respectively. The pathological diagnosis was achieved in all 50 patients.

Conclusions

In undetermined ILD patients, uniportal VATS approach with light sedation, spontaneous breathing and local wound anesthesia appears to be a practice and safe solution with an excellent diagnostic yield and patients satisfaction.

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Image or Table

Table 1. Descriptive statistics of patients undergoing awake uniportal video-assisted surgical lung biopsy for radiological undetermined ILD.

Characteristic	*AWAKE VATS SLBs* (n 50)
Sex, n (%)	
-Male	38 (76 %)
-Female	12 (24 %)
Tabagism, n (%)	
-Active	3 (6 %)
-Ex-smokers	31 (62 %)
-No-smokers	16 (32 %)
Age, mean (SD); years	65.59 (9.67)
Charlson comorbidity score, mean (SD)	3.96 (1.73)
BMI, mean (SD)	27.18 (4.62)
ASA, mean (SD)	2.08 (0.52)
FVC%, median (range)	82.00 (40.00 – 153.00)
FEV1%, median (range)	87.00 (41.0 – 141.00)
DLCO%, median (range)	57.50 (30.00 – 110.00)
Surgical operative time, mean (SD); minutes	49.56 (23.51)
Global operating-room time, mean (SD); minutes	90.80 (39.63)
Intraoperative complications, n (%)	
-Yes	0 (0 %)
-No	50 (100%)
Pleural adherences, n (%)	
-Yes	13 (26 %)
-No	37 (74 %)
Postoperative complications (Clavien-Dindo)	
-Yes	0 (0 %)
-No	50 (100 %)
Prolonged air leaks, n (%)	
-Yes	0 (0 %)
-No	50 (100 %)
pLOS, mean (SD); days	1.26 (1.04)
90-days patients survival, n (%)	
-Yes	49 (88 %)
-No	1 (2 %)

SD = Standard Deviation; BMI = Body Mass Index; FVC% = Forced Vital Capacity%; FEV1% = Forced expiratory volume% in the 1st second; DLCO% = Diffusion Lung CO%; ASA = American Society of Anesthesiologists score; pLOS = post operative length of stay

(214) Submission ID#477805

Can cryotherapy be a valid alternative to surgery for endobronchial carcinoid management? A single-centre experience.

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Periklis Perikleous – Harefield Hospital

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Thoracic Surgery

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Each year in the UK around 2,900 patients are diagnosed with carcinoid, a rare, slow-growing tumour that originates in neuroendocrine cells, most commonly present in the gastrointestinal (60%) and respiratory (25-33%) tracts. Histopathologic diagnosis and classification requires tissue biopsy whilst management depends on tumours anatomic site and size, extent, secretory profile, and general status of patient. Surgical resection remains the primary approach for most localized carcinoids; cryoablation may be considered when surgery is not feasible or in preparation for surgery. We present a single centre experience in use of cryoablation for management of carcinoid tumours.

Methods
For this retrospective analysis, data were collected from prospectively populated patient databases, operative logbooks, and patients medical records. Between 2011-2018, a total of 19 patients diagnosed with carcinoid underwent a series of cryoablation procedures, either alone or in combination with surgery, in our institution. Before deciding on their management strategy, patients had been appropriately discussed in our lung MDT meeting; they were considered for first line cryoablation when surgical resection was deemed not possible or when they had rejected offered surgery.

Results
Cryoablation alone resulted to compete removal of tumours in 9 (47.36%) patients, as evidenced by follow-up bronchoscopies and/or histopathologic confirmation. Of those, 5 (26.31%) were unfit for surgery, 1 (5.26%) did not wish to have surgery, 1 (5.26%) did not require surgery and 2 (10.52%) underwent surgery but no residual tumour was found. Successful reduction in tumour size allowed 6 (31.57%) patients to avoid pneumonectomy and 3 (15.79%) to avoid bilobectomy. No patients were diagnosed with disease recurrence on follow-up.

Conclusions
Cryoblation can result to definitive management in unfit patients or be part of a cytoreductive strategy in preparation for surgery, aiming to reduce the size of tumour or help identify its limits, in order to avoid extensive resection and unnecessary loss in lung function.

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Image or Table

Table 1. Cryoablation data for carcinoid cases between 2011-2017 at Harefield Hospital.

Age on admission	Gender	Number of cryoablation procedures	Thoraco-score	Surgical resection	Type of resection	Complex resection	Year of surgery	Initial histology	Final histology	Why cryoablation ?	Response to cryoablation ?
36	M	1	0.62	Yes	Right lower bilobectomy	Broncho-plasty	2011	Carcinoid - typical	Carcinoid - typical pT1b N0 PL0 R0	To avoid pneumon-ectomy	Yes
27	F	1	0.46	Yes	Left lower lobectomy	No	2012	Carcinoid - typical	Carcinoid - typical pT1b N1 PL0 R0	To avoid pneumon-ectomy	Yes
43	F	6	0.46	Yes	Left upper lobectomy	Broncho-plasty	2012	Carcinoid - typical	Carcinoid - typical pT1a N0 PL0 R0	To avoid pneumon-ectomy	Yes
74	M	2	1.93	No	No resection	N/A	2013	Carcinoid	No sample obtained - no visible tumour	Patient preference	Yes
58	F	8	0.98	Yes	Right middle lobectomy	Broncho-plasty	2014	Carcinoid - typical	Carcinoid - typical pT2a N0 PL0 R1	Identify origin of lesion	No
66	F	3	1.24	Yes	Right lower bilobectomy	Broncho-plasty	2014	Carcinoid	Carcinoid - typical pT2b N0 PL0 R0	Identify origin of lesion	Yes
77	F	5	1.45	No	No resection	N/A	2014	Carcinoid - typical	No sample obtained - no visible tumour	Unfit - medical co-morbidities	Yes
37	F	1	0.22	Yes	Right upper lobectomy	No	2014	Carcinoid - typical	Carcinoid - typical pT1a N0 PL0 R0	To reduce size	Yes
53	F	2	0.83	Yes	Left upper lobectomy	Sleeve	2015	Carcinoid	Carcinoid - atypical pT2a N0 PL0 R1	To avoid pneumon-ectomy	Yes
67	F	7	2.63	No	No resection	N/A	2015	Carcinoid - typical	No tumour	No remaining tumour	Yes
36	M	1	0.34	Yes	Right lower lobectomy	Broncho-plasty	2015	Carcinoid	Carcinoid - typical pT1a N0 PL0 R0	Identify origin of lesion	Yes
80	M	15	1.93	No	No resection	N/A	2015	Carcinoid - typical	No tumour	Unfit - medical co-morbidities	Yes
72	M	3	1.93	Yes	Left lower lobectomy	Sleeve	2015	Carcinoid - typical	Carcinoid - typical pT1b N0 PL0 R0	To avoid pneumon-ectomy	Yes
34	F	4	0.22	Yes	Left secondary carina only	Broncho-plasty	2015	Carcinoid - typical	No tumour	To avoid pneumon-ectomy	Yes
36	M	2	0.34	Yes	Bronchus intermedius only	Broncho-plasty	2016	Carcinoid - typical	No tumour	Identify origin of lesion	Yes
48	M	3	0.34	Yes	Left lower lobectomy	Broncho-plasty	2016	Carcinoid - typical	Carcinoid - typical pT1a N0 PL0 R0	To avoid pneumon-ectomy	Yes
43	F	2	0.83	No	No resection	N/A	2016	Carcinoid - typical	No sample obtained - no visible tumour	Unfit - medical co-morbidities	Yes
60	F	8	0.98	No	No resection	N/A	2016	Carcinoid - typical	No tumour	Unfit - poor lung function	Yes
45	M	8	0.46	No	No resection	N/A	2017	Carcinoid - typical	No tumour	Unfit - poor lung function	Yes

(215) Submission ID#458406

Completion pneumonectomy through median sternotomy and posterolateral incision approach for recurrent lung cancer after bronchoplastic surgery

Submission Type: Poster Session ONLY

Submission Status: Complete

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Thoracic Surgery

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background

Completion pneumonectomy (CP) is accompanied by high risk and its results are not satisfactory. Therefore, caution is needed for adaptation. We show a case in which we performed CP for recurrent lung cancer after

bronchoplastic surgery through posterolateral incision following confirmation the resectability of hilar structure and the absence of mediastinal lymph node metastasis through median sternotomy.

Methods
A 71-year-old man. A left upper sleeve lobectomy (squamous cell carcinoma, pT2N1M0) was performed in March 20xx. Local recurrence (main bronchus / pulmonary artery) was pointed out in CT on January 20xx+2. There was no other organ metastasis. He had good pulmonary function and the prediction capacity of residual FEV1.0 was 1.94 L.

Results
CP was performed in February of 20xx+2. First, a median sternotomy was made in the supine position, the pericardium was dissected, and it was confirmed that the left main pulmonary artery and left main bronchus could be dissected. Next, after confirming absence of N2, the left main pulmonary artery was cut off and midline incision was closed. Then converted to the right lateral decubitus position and posterolateral incision was added. After separating the inferior pulmonary vein and superior pulmonary vein stump in the pericardium, the left main bronchus was peeled and cut, and the left lower lobe was removed. Surgery time 13 hours 7 minutes, bleeding volume 2.23L. The postoperative course was generally smoothly and discharged from the hospital on the 30th postoperative day.

Conclusions
The incidence of severe complications after CP ranges from 18.4% to 40.7%, and the occurrence rate of bronchial fistula is considered to be 10%. The prognosis is also reported to be 38.9 to 48.3% at 3 year and 16.9 to 48% at 5 year, and cautious adaptation decisions are necessary. The method of confirming the resectability of hilar structure and the absence of mediastinal lymph node metastasis by median sternotomy is useful for final decision of CP adaptation. Also, there is an advantage that the intrathoracic operation can be easily performed by previously treating the hilum portion. We also discuss notes on deviation of pulmonary artery after bronchoplastic surgery

(216) Submission ID#477022

Extended Sleeve Resection for Advanced Lung Cancer

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Tomoki Shibano – Department of General Thoracic Surgery, Jichi Medical University

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Thoracic Surgery

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Avoiding pneumonectomy by performing extended sleeve resection is beneficial for residual pulmonary compromise in advanced lung cancer patients. However, little is known about the operative feasibility and oncologic validity of this procedure.

Methods
We retrospectively investigated 35 non-small cell lung cancer patients (p-stage II: 13, III: 22) who had undergone extended sleeve resection at our centers during the period from November 2006 through January

2017. Lung cancers which reveal direct tumor invasion or extra nodal invasion invasion to the bronchus were assigned for this procedure. Surgical procedures were classified as following according to modified Okada classification: Type A, right upper lobe + S6 sleeve resection; Type B, left upper lobe + S6 sleeve resection; Type C, left lower lobe + S4+5 sleeve resection; Type D, right lower lobe sleeve resection. Surgical outcome per each procedure was assessed.

Results

There were 7 cases of type A, 2 of type B, 16 of type C, and 10 of type D. Average surgical time and blood loss were 261±66 min and 593±544 mL respectively. Twenty-two complications occurred in 19 cases. Stenosis or disruption of the anastomotic site occurred in 7 cases (20%). Proximal sleeve resection (type A, B) ($p<0.01$), right side surgery ($p=0.04$), and pulmonary artery plasty ($p<0.01$) were risk factors for anastomosis site complications. Observation period ranged from 0 to 109 months. Local recurrence occurred in 1 patient (2.8%). Overall survival and disease free survival at 2 and 5 years were 82.0%, 64.2% and 42.4%, 38.5% respectively.

Conclusions

Extended sleeve resection provides good prognosis for advanced lung cancer cases, especially for distal sleeve resection (type C and D). Frequent postoperative bronchoscopy is necessary for proximal sleeve resection, right side surgery, and pulmonary artery plasty cases.

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(217) Submission ID#473556

Postoperative prognosis of lung cancer patients who underwent preoperative endobronchial ultrasound-guided transbronchial needle aspiration for mediastinal staging

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Yuki Shiina – Department of General Thoracic Surgery, Chiba University Graduate School of Medicine, Chiba, Japan

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- No

Background
Endobronchial Ultrasound-guided Transbronchial Needle Aspiration (EBUS-TBNA) is recommended as minimally invasive modality for mediastinal staging. However, the detailed background of preoperative EBUS-TBNA candidates and postoperative prognoses still remains unclear.

Methods
Among patients with non-small cell lung cancer who underwent radical surgery between January 2002 and December 2012, cN0 patients (n=1028) which included 1) radiological cN0 without EBUS-TBNA (R-cN0 group, n=790) and 2) cN0 by EBUS-TBNA (E-cN0 group, n=238) were retrospectively reviewed using prospectively registered database, and clinical characteristics, incidence of stage migrations, and postoperative prognosis were analyzed.

Results
The indication of EBUS-TBNA were 1) highly suspected N2 disease (n=65), and 2) suspected N1 disease or centrally located tumor (n=59), and 3) others (n=114). The ecN0 group had more or larger 1) male gender, 2) solid part tumor size, 3) centrally located tumor, 4) non-adenocarcinoma, 5) elder subjects, 6) co-existence with interstitial pneumonia, 7) more than lobectomy subjects, 8) undergoing systematic mediastinal dissection. The incidence of false negatives in mediastinal staging was not significant between two groups (8.4% vs. 6.1%, p=0.205), and between each indication of EBUS-TBNA. As for the prognosis analysis, the ecN0 group had worth prognoses (Figure. A) and worth disease specific survival (DSS) (Figure. C) than rcN0 group (p<0.0001); however, no significant difference was observed in prognoses (log-rank p=0.891, Wilcoxon 0.892) (Figure. B) and DSS (log-rank p=0.395, Wilcoxon 0.719) (Figure. D) between two groups (n=211, 211) after propensity-score matching, by age, gender, solid part tumor size, tumor location, pathological type, co-existence of interstitial pneumonia or COPD, surgical procedure.

Conclusions
The EBUS-TBNA candidates had worse backgrounds influencing their postoperative prognoses. The preoperative EBUS-TBNA is important for these group in order to determine the treatment strategy.

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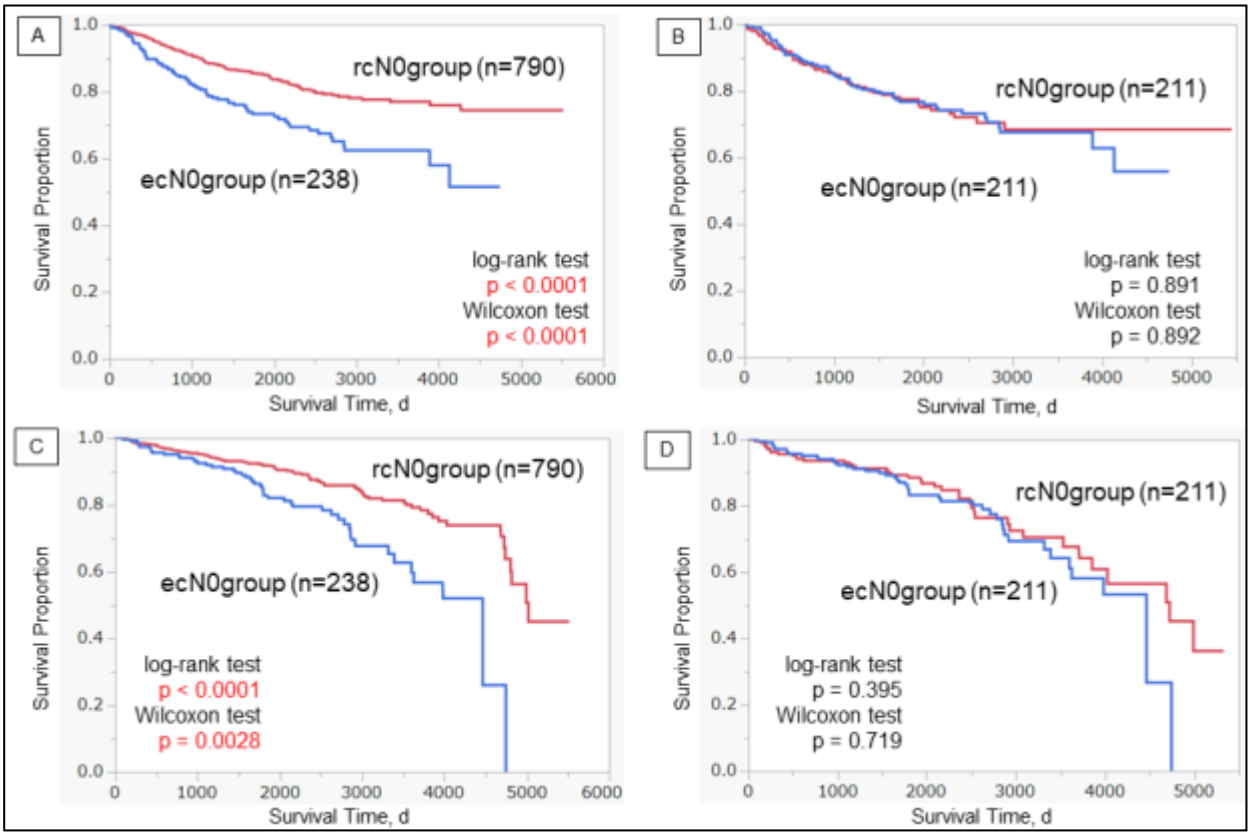
A
rcN0group (n=790)
ecN0group (n=238)
log-rank test
p < 0.0001
Wilcoxon test
p < 0.0001
Survival Proportion
Survival Time, d
B
rcN0group (n=211)
ecN0group (n=211)
log-rank test
p = 0.891
Wilcoxon test
p = 0.892
Survival Proportion
Survival Time, d
C
rcN0group (n=790)
ecN0group (n=238)
log-rank test
p < 0.0001
Wilcoxon test
p = 0.0028
Survival Proportion
Survival Time, d
D
rcN0group (n=211)
ecN0group (n=211)
log-rank test
p = 0.395
Wilcoxon test
p = 0.719
Survival Proportion
Survival Time, d

(218) Submission ID#454989

Prognostic factors of long-term results after palliative surgical treatment for severe pulmonary emphysema

Submission Type: Oral Presentation ONLY

Submission Status: Complete

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Disclosure Status: Complete

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Thoracic Surgery

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- No

Background

Pulmonary emphysema (PE) is characterized by progressing course, as a result severe respiratory failure is formed. The only method of radical treatment of severe PE is bilateral lungs transplantation, and lung volume reduction surgery (LVRS) and bullectomy are considered as a palliation. The aim of the study was to identify predictors of long-term results after palliative surgeries for severe PE.

Methods

From 1996 to 2016, 199 patients with severe PE were surgically treated, 111 of them underwent bullectomy, 88 - LVRS. In 89% of patients operation was on one side only. Patients were divided into groups according to the prevalence of emphysematous lesions (without large bullae and slightly affected remaining lung, large and giant bullae and slightly affected remaining lung, without large bullae and severe PE in remaining lung, large and giant bullae and severe PE in remaining lung, predominantly upper and lower types of PE, homogenous PE). Survival and dynamics of respiratory failure after surgeries in each group were analyzed.

Results

The characteristics of postoperative period and follow-up in each group is given. The frequency of deaths within 5 years after the operation was the greatest in the group of without large bullae and severe emphysema in remaining lung (51,6%), large and giant bullae and severe emphysema in remaining lung (36,4%). Mortality was lowest in groups of without large bullae and slightly affected remaining lung tissue (4,2%), large and giant bullae and slightly affected remaining lung tissue (2,2%). 5-year survival was similar in predominantly upper (81,3%) and lower types (77,8%) of emphysema and homogenous PE (80,9%). The worst results of postoperative respiratory function were proved in patients with severe emphysema in the remaining pulmonary parenchyma (p=0,000). The other factors of adverse postoperative course were age over 60 years old (p = 0,01), continued smoking (p = 0.01), exacerbations more than two times per year (p = 0.01) and severe comorbidity (p = 0.03).

Conclusions

The most important factor of long-term success after palliative surgeries for severe PE is the quality of the remaining pulmonary parenchyma, rather than the character of resected emphysematous tissue. These operations, depending on these features, can be considered as a preparation stage or as an alternative to lung transplantation.

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(220) Submission ID#449793

Two-staged surgery without parenchyma resection for endobronchial carcinoid tumour

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Oleg Pikin – Moscow Hertzen Research Institute of Oncology

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
The low-grade malignant potential, very low incidence of intrathoracic lymph node metastases and predominantly intraluminal growth are the main reasons for parenchyma-sparing resections in patients with typical bronchial carcinoids. The aim of the study is to evaluate the efficacy of combined approach (endoscopic resection followed by pure bronchoplasty without any pulmonary resection) in patients with endobronchial carcinoids.

Methods
We applied two-staged technique (endoscopic resection first followed by pure bronchoplasty) to 28 patients (males 12) with endobronchial carcinoid. The median age was 32,4 years with a range from 19 to 64 years. The indications to this technique were pure endobronchial carcinoid without lymph node involvement. Tumour was located on the right side in 20 (71,4%), on the left in 8 (28,6%) patients. Flexible bronchoscopy was carried out to all patients as the first stage procedure for debulking and searching for a true pedicle of the tumour. The time interval between endoscopic resection and bronchoplastic procedure varied from 10 to 14 days (median 12,8 days). Different types of pure bronchoplasty were performed as the second stage surgery with systematic mediastinal lymph node dissection.

Results
Types of bronchial bronchoplasty are summarized in Table 1. The resection was complete (R0) in all cases.

Tumours were pathologically staged as pT1aN0 in 21, pT2N0 in 5, pT3N0 in 2 patients (26 were typical and only two - atypical carcinoids). Morbidity was 25,0% with no 30- and 90-day mortality. Pneumonia was diagnosed in 4, atrial fibrillation in 1, wound infection in 1 and bleeding after first-stage procedure in 1 patient. Bleeding after endoscopic resection of typical carcinoid in the left stem bronchus required its urgent resection. During follow-up the stenosis of the bronchial anastomosis was observed in one patient two months after surgery which was treated successfully by endoscopic dilatation. Overall 5- and 10-years survival was 100,0% and 91,8% (one patient died from myocardial infarction 8 years after surgery). No recurrence of the primary tumour was observed in any case.

Conclusions

Two-staged surgery (endoscopic resection and pure bronchoplasty without lung parenchyma resection) is an effective technique for the treatment of endobronchial carcinoid with an excellent oncologic outcome.

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Image or Table

Table 1. Types of bronchial sleeve resections in our series

Type of resection	Right side	Left side
Main stem bronchus	7	6
Bronchus intermedius	7	-
Main stem bronchus + upper lobe bronchus	3	2
Bronchus intermedius+ middle lobe bronchus	2	-
Bronchus intermedius+ lower lobe bronchus	1	-
Total	20 (6)*	8 (2)*

*polybronchial anastomosis was performed

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(221) Submission ID#478637

11-year experience of Auto-Fluorescence Bronchoscopy for the patients with abnormal sputum cytology findings

Submission Type: Poster Session ONLY
Submission Status: Complete
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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Auto-Fluorescence Bronchoscopy (AFB) is performed to detect premalignant and malignant tissues in the airways. Its indications include generally known or suspected lung cancer by abnormal sputum cytology findings, inspection for synchronous tumors, surveillance following cancer resection, and primary screening among high-risk patients. However, there is no diagnosis algorism and little is known about the utility of AFB in the clinical setting.

Methods
We retrospectively reviewed bronchoscopy database and assessed the patients who underwent AFB at our hospital from April 2007 to Janualy 2018.

Results
Among 9528 patients who were examined by bronchoscopy, AFB was perfomed to138 patients. The reasons of AFB were divided into abnormal sputum cytology findings/to check operability/following cancer resection/primary screening/others; 37/31/5/0/65. About 37 cases with abnormal sputum cytology findings, the median age was 71 years old (range: 31-85), and 33 patients were male. Median Brinkman index was 1200 (range: 0-3000), and 26 patients were former smoker. Except for 2 cases of vocal cord disease with abnormal sputum cytology findings, first examination findings of white light bronchoscopy (WLB) and AFB showed normal /abnormal; 24/11, 21/14, respectively. 6 out of 14 AFB abnormal cases were diagnosed as cancer by biopsy of abnormal lesion, and 8 cases were nomal or dysplasia (normal or light/moderate-severe; 5/3) at first diagnosis. Among 11 cases who were diagnosed non-cancer at first bronchoscopy, 4 cases of dysplasia (light/moderate/severe; 2/1/1) developed to cancer during follow-up for 12-54 months.

Conclusions
In 2 out of 37 cases with abnormal sputum cytology findings, abnormal lesion was detectable only by AFB despite WLB normal. Dysplasia which specimen was taken from AFB abnomal lesion and histologically confirmed in 4 cases with abnormal sputum cytology findings developed cancer during follow-up.

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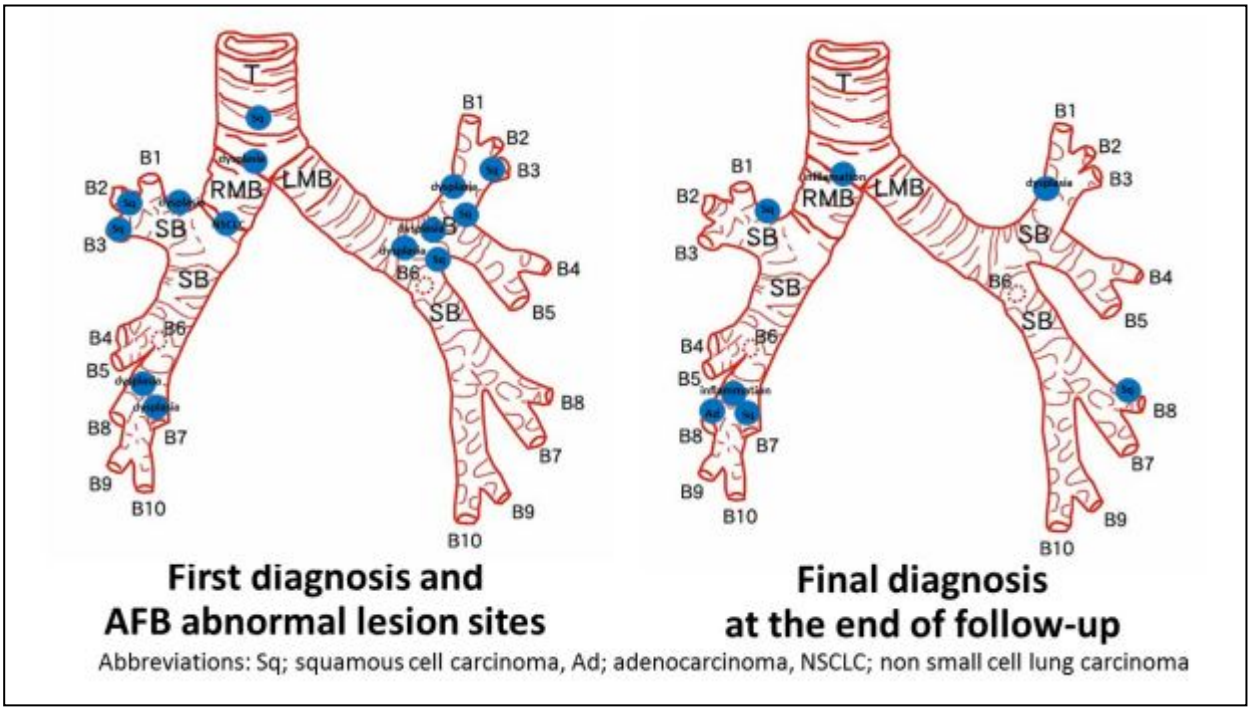

Abbreviations: Sq; squamous cell carcinoma, Ad; adenocarcinoma, NSCLC; non small cell lung carcinoma

(222) Submission ID#478049

A new classification system of central airway and 2391 cases with malignant neoplasms of central airway

Submission Type: Oral and Poster
Submission Status: Complete
Submitter: Hongwu Wang – Yes

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Disclosure Status: Complete
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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Central airway refers to the trachea and main bronchi.To our knowledge, few studies had focused on the characteristics and classification of the central airway tumors. This study is to report a new classification system of central airway and to analyse 2391 cases with malignant neoplasms of central airway .

Methods
Materials and methods: The bronchoscopy and pathology data were retrospectively reviewed in 2391 cases with malignant central airway neoplasms from 2005.10.08 to 2017.12.31 at our single center.The median age was 60.3±1.2 (6 to 92)yrs.Among them, 1821 were males, and 566 women . The central airway are divided into eight zones. The trachea was equally divided into 3 zones (, ,) and the carina as zone ; the right main bronchus was , the right bronchus intermedius was . The left main bronchus was equally divided into 2 zones and . According to the invading range of the lesion, the tumor was classified into localized and diffused type. According to the localization of the lesions in the CT image,the central airway tumors were classified into four types:intra-luminal, mural, external and mixed type.

Results

Results: Malignant central airway neoplasms were mainly found at region 3,5 and 7 in the airway, most of them were primary, mixed type and squamous carcinoma pathologically. Adenocarcinoma, small cell lung carcinoma(SCLC) and mucoepidermoid carcinoma(MECwere mainly located at bronchus, while adenocystic carcinoma were mostly found in trachea. Esophagus carcinoma mostly involved in region 2,3,7 of the airway, and thyroid carcinoma was the most common invading tumor of zone 1.
Squamous cell carcinoma is the most common type of central airway carcinoma, accounting for 38.3% of the central airway cancer.Then percentage of adenocarcinoma was 14.5%, Adenoid cystic carcinoma 7%,small cell lung carcinoma 7%,Mucoepidermoid carcinoma 1.7%. Tumors in other parts of the body could metastasis to the trachea-bronchia. The most common metastasis is esophageal cancer invasion ,accounting for 24.6%, and often accompanied with tracheo-esophageal fistula. Then the thyroid cancers was 2.1%, renal cell carcinoma 1.3%,breast cancer 0.8%.

Conclusions
The new classification system of central airway provide a helpful tool to exactly and easily determine the location of malignant central airway neoplasms, and may profit clinical diagnosis and treatment.

(223) Submission ID#459768

BAL in immunocompromised patients-yield and microbiological profile

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Pratibha Singhal – bombay hospital and institute of medical sciences,mumbai,india

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

Infections account for 75% of all pulmonary complications in immunocompromised patients. Accurate diagnosis and early specific therapy is the key to optimal management. Fibre optic bronchoscopy(FOB) and Bronchoalveolar lavage(BAL) has been documented as a diagnostic tool for identifying causative pathogens in such patients. Very few such studies have been conducted in Indian scenario. The objective is to study the yield and microbiological profile of BAL in immunocompromised patients with suspected lung infections and also the concordance between the clinico-radiological and microbiological diagnosis.

Methods

70 cases based on the cause of immunosuppression were divided into the following groups: 1) solid organ transplant 2) Hematological malignancy 3) Immunosupressive therapy 4) Renal failure on dialysis 5) HIV infection. They were categorized clinically as symptomatic or asymptomatic and the radiological findings were

classified as either alveolar or nodular. A clinico-radiological impression was made. Relevant microbiological investigations were done on BAL samples and its yield and microbiological result was established. Correlation between the clinico-radiological and microbiological diagnosis on BAL was also studied.

Results

The positive yield of BAL in our study is 75.7% which was higher in symptomatic patients (77.27%) and those with predominantly alveolar radiological findings (87.5%). The microbiological isolates were bacteria in 41 cases(58.6%), fungi in 19(27.1%), M.tuberculosis in 10(14.3%), Nocardia in 2(2.9%), NTM in 1(1.4%) case each. No organism was isolated in 17(24.3%) cases. 34 of 41(82.9%) bacterial isolates were gram negative, majority of which was Klebsiella pneumonia (52.9%). 66 % of the positive yield constituted of a single type of infection, while 34% had more than one type of infection. Bacteria were the most common isolates in all the groups except in HIV infected patients where 2 of the 4(50%) cases had Mycobacterium Tuberculosis infection. The 2 cases of pulmonary nocardiosis and the only case of Non Tuberculous Mycobacteria infection were isolated amongst the solid organ transplant recipients. BAL changed the diagnosis in comparison to the clinico-radiological impression in 45 of total 70 cases(64.3%).

Conclusions

BAL is useful for rapid diagnosis of infections in immunocompromised patients more so in symptomatic patients and those with alveolar radiological findings. Bacterial infections, of which gram negative bacteria are most prevalent but co-existing infections with other microorganism are common. High yield of BAL and high discordance between clinico-radiological and microbiological diagnosis establishes the importance of BAL for early and specific treatment of pulmonary infections in immunocompromised patients.

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Yield of Bronchoalveolar lavage (BAL) in Immunocompromised groups

Group	BAL yield		Total
	Negative	Positive	
Renal failure on hemodialysis	5 (20.8%)	19 (79.2%)	24
Hematological malignancy	3 (27.2%)	8 (72.7%)	11
HIV	2 (50%)	2 (50%)	4
Use of Immunosuppressants	4 (23.5%)	13 (76.5%)	17
Solid organ transplant	3 (21.4%)	11 (78.6%)	14
Total	17 (24.3%)	53 (75.7%)	70

(224) Submission ID#458423

Benign tumors of the tracheobronchial tree: clinicopathological features in 24 cases

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Yuko Abe – Internal medicine, National Hospital Organization Kinki-chuo Chest Medical Center, Japan

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Benign tumors of the tracheobronchial tree are quite rare. The details of clinical and pathological features are unclear.

Methods
We retrospectively reviewed consecutive bronchoscopy examination database and assessed the patients who were diagnosed as benign tumors of the tracheobronchial tree at our institution from July 1998 to June 2016.

Results
Of a total of over 15,000 patients, 24 patients were diagnosed to be benign tumors. Leiomyomas and schwannomas accounted for majority (5 patients each), followed by 4 chondromas, 3 hamartomas, 3 papillomas, 2 fibromas and 2 lipomas. The median age was 62 years with 18 male patients and 16 former smokers. In 20 cases, bronchoscopy were performed to examine symptom or abnormal shadow of chest X-ray and computed tomography. In other four cases, they were diagnosed fortuitously at bronchoscopy done for unrelated condition. Fourteen of 24 patients received bronchoscopic or surgical resections as diagnostic therapy or treatment. Of these, 13 patients were followed up by bronchoscopy or computed tomography; the median follow up time was 25.1 months. During the follow-up period, one patient with hamartoma relapsed and received bronchoscopic resected again. In addition, according to the revision of WHO classification in 2015, pathological examination revealed that there were changes in diagnosis in 11 cases.

Conclusions
Benign tumors in the bronchial tree are quite rare. Careful follow-ups are necessary, because we experienced one relapsed patient.

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Image or Table

Patients Characteristics

No	Age	Gender	Site	Size	Tx	1st diagnosis	2nd diagnosis
1	79	F	RMB	L	Snare、ope	Papilloma	Papilloma
2	60	F	Rt B8	M	Electrocautery	Leiomyoma	Leiomyoma
3	59	M	Rt B6	L	Snare	Chondroma or hamartoma	Lipoma
4	63	M	Trachea	S	-	Leiomyoma or inflammation	Leiomyoma
5	55	M	Rt B10	L	Snare	Chondroma or inflammation	Chondroma
6	67	M	Rt B9/10 spur	S	-	Leiomyoma	Leiomyoma
7	35	F	TIM	L	Snare	Schwannoma	Schwannoma
8	70	M	Rt B8	S	-	Fibroma or inflammation	Fibroma
9	67	M	Rt B4/5 spur	S	-	Schwannoma or inflammation	Schwannoma
10	33	F	LMB	L	Snare	Hamartoma	Chondroma
11	61	M	Rt B4	S	-	Fibroma or inflammation	Fibroma
12	59	F	Rt B8	L	Snare	Chondroma or inflammation	Lipoma
13	72	M	Trachea	M	Snare	Chondroma or hamartoma	Chondroma
14	66	M	Rt B5	M	Snare	Schwannoma	Schwannoma
15	50	M	Rt B8/9	S	-	Leiomyoma	Leiomyoma
16	55	M	RUB	L	Ope	Hamartoma	Chondroma
17	69	M	LUB	S	-	Schwannoma	Schwannoma
18	51	M	Rt B6 b	L	Ope	Papilloma	Papilloma
19	63	M	Lt B8	L	Snare	Lipoma	Lipoma
20	54	M	Rt B8	L	Ope	Hamartoma	Hamartoma

(225) Submission ID#471545

Bronchoscopic removal of huge bronchus-like blood clot

Submission Type: Case Report
Submission Status: Complete
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No financial relationships or conflicts of interest.

Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
A 38-year-old woman presented with a 3-month history of cough. CT examination found a parahilar mass in right upper lobe with corresponding distal atelectasis. Multiple nodules in the subpleural space and interlobar membrane of right lung were also seen (Figure A Lung window and B Mediastinum window). Fibrobronchoscopy was conducted under local anesthesia to facilitate pathological examination. This patient underwent huge hemorrhage and hemostasis was required using hemocoagulase atrox injection. A blood clot was seen stretching over the both main bronchus (Figure C), which could not be suctioned after the aspiration of hemorrhage. She experienced awareness loss gradually. Her heart rate decreased to 14 and her SpO2 14%. Her blood pressure could not be measured.

Case Report
Endotracheal intubation was conducted immediately and intraluminal freezing techniques were then used to

pull out the blood clot (Figure D; Figure E showed the blood clot measured as 13 centimeters in length.). After the pull-out (Figure F, showed the carina), she regained her awareness and her vital signs returned stable. Pathologic examination showed central-type adenocarcinoma of right lung with T4N3M1C staging.

Conclusion

Bronchoscopic removal of huge bronchus-like blood clot is a quick and effective way to save lives.

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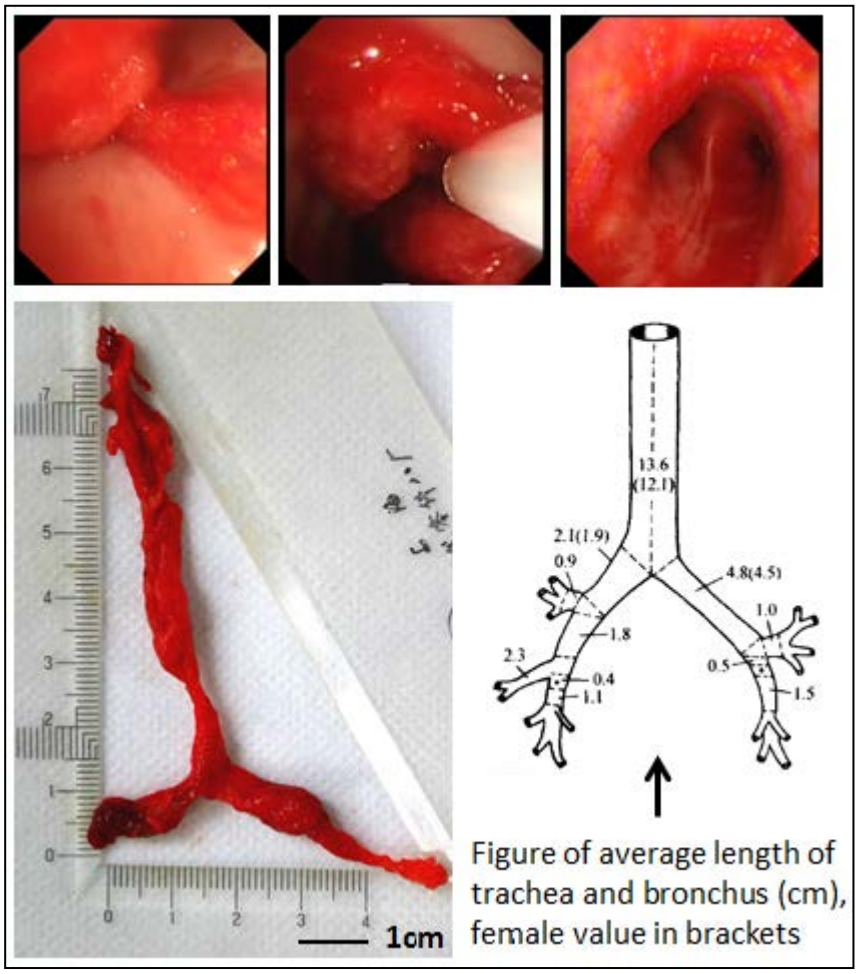

(226) Submission ID#451894

Bronchoscopic therapy of tracheal stenosis. Comparative study of two periods.

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Vitezslav Kolek – Dept. of Respiratory Medicine

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Bronchoscopic therapy can be definitive or palliative solution of tracheal stenosis. Its results depend on etiology, size and localisation of tracheal narrowing, as well as on clinical characteristics of patients (pts).

Methods
The retrospective study evaluates characteristics of 502 tracheal stenoses diagnosed during two periods: P1 from 1995 to 2006 (278 pts) and P2 from 2007 to 2016 (224 pts) in one bonchoscopic centre. Age, sex and survival of pts, etiology, localisation and treatment methods of stenoses were compared.

Results
The most prominent difference of evaluated periods was mean age of pts: 53.7 y in P1 vs 61.5 y in P2. The difference of age in 320 men was 47.3 y vs 59.3 y, in 182 women 52.9 y vs 62.9 y, in 222 benign stenoses 47.6 y vs 59.3 y, in 280 malignant stenoses 58.8 y vs 64.6 y. Spectrum of stenoses was similar in both periods. The most frequent types of benign stenoses were iatrogenic (after tracheostomy, intubation, resection 89%). Bronchogenes (55.7%) and oesophageal (14.2%) cancers were most frequent causes of malignant stenoses. Median of survival (MoS) in benign stenoses was 64.4 m vs 46.8 m, MoS in malignant stenoses was 7.1 m vs 4.0 m. Bronchological procedures used did not changed during evaluated periods. Laser (219 pts), brachytherapy (61 pts) and stents (252 pts) were used in similar frequencies in both periods. Surgical resection was done in 46 pts, definitive tracheostomy in 25 pts and T-tubus insertion in 21 pts.

Conclusions
Spectrum of tracheal stenoses and bronchoscopic therapeutic procedures used during last 20 years in not changing essentially, but in P2 period patients were older, with more comorbidities and shorter survival.

(227) Submission ID#477085

Cervical cancer diagnosed by endoscopic ultrasound-guided fine-needle aspiration

Submission Type: Case Report
Submission Status: Complete
Submitter: Niral Patel – Norwalk Hospital/Yale University

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
With human papillomavirus(HPV) vaccinations and screening, late stage cervical cancer is rarer than it was in

the past. However, late stage cervical cancer does require rapid identification and treatment. This can be difficult when biopsy of metastasis is difficult or invasive procedures are deemed to be a higher risk. Ultrasound guided procedures have been used successfully in the past to make these diagnoses, but endobronchial ultrasound guided fine-needle aspiration (EBUS-FNA) has not been previously used. This is the first such reported case.

Case Report

A 56 year old female with stage 3B poorly differentiated squamous cell cervical cancer treated with brachytherapy, pelvic radiation, and cisplatin presented to establish care after recently moving. She had recently undergone imaging which was notable for an infraclavicular pleural mass (3.1x1.3x4.0 cm, maximum SUV 5.4) abutting the right upper lobe on PET scan, see Figure 1 for a representative CT. She had symptoms of exertional dyspnea, fatigue, dyspnea, neck fullness, and pulsations. History was notable for venous thromboemboli with IVC filter, spinal stenosis, hydronephrosis, fibroids, vaginal bleeding, being a former smoker, and a family history of lung cancer. Interventional radiology assessed the patient for biopsy, but it was felt to be a high risk procedure based upon location. She was subsequently referred to interventional pulmonary. EBUS was performed with local anesthesia and with rapid onsite evaluation (ROSE). The airways were inspected with a therapeutic bronchoscope and noted to be grossly normal bilaterally down to the subsegments. Next an endobronchial ultrasound (EBUS) bronchoscope was used to identify and biopsy lymph nodes at stations 11L, 4L, 7, 4R, and 11R. Next an irregular mass was identified by ultrasound posterior and lateral to the right paratracheal space, in the region identified by PET. The mass was biopsied with eight needle passes after which the EBUS bronchoscope was removed and a therapeutic bronchoscope was used to clear any remaining secretions and to ensure hemostasis. Pathology was consistent with squamous cell carcinoma determined to most likely be metastatic spread. The patient subsequently successfully underwent further radiation therapy.

Conclusion

The spread of the use of EBUS-FNA has led to increased applications for diagnostic procedures which in the past have required high risk procedures. Given that squamous cell cervical cancer has a proclivity towards pulmonary metastasis, future use of EBUS-FNA is not difficult to imagine. This case demonstrates safety in the diagnosis of metastatic cervical cancer which to date has not been done by EBUS-FNA.

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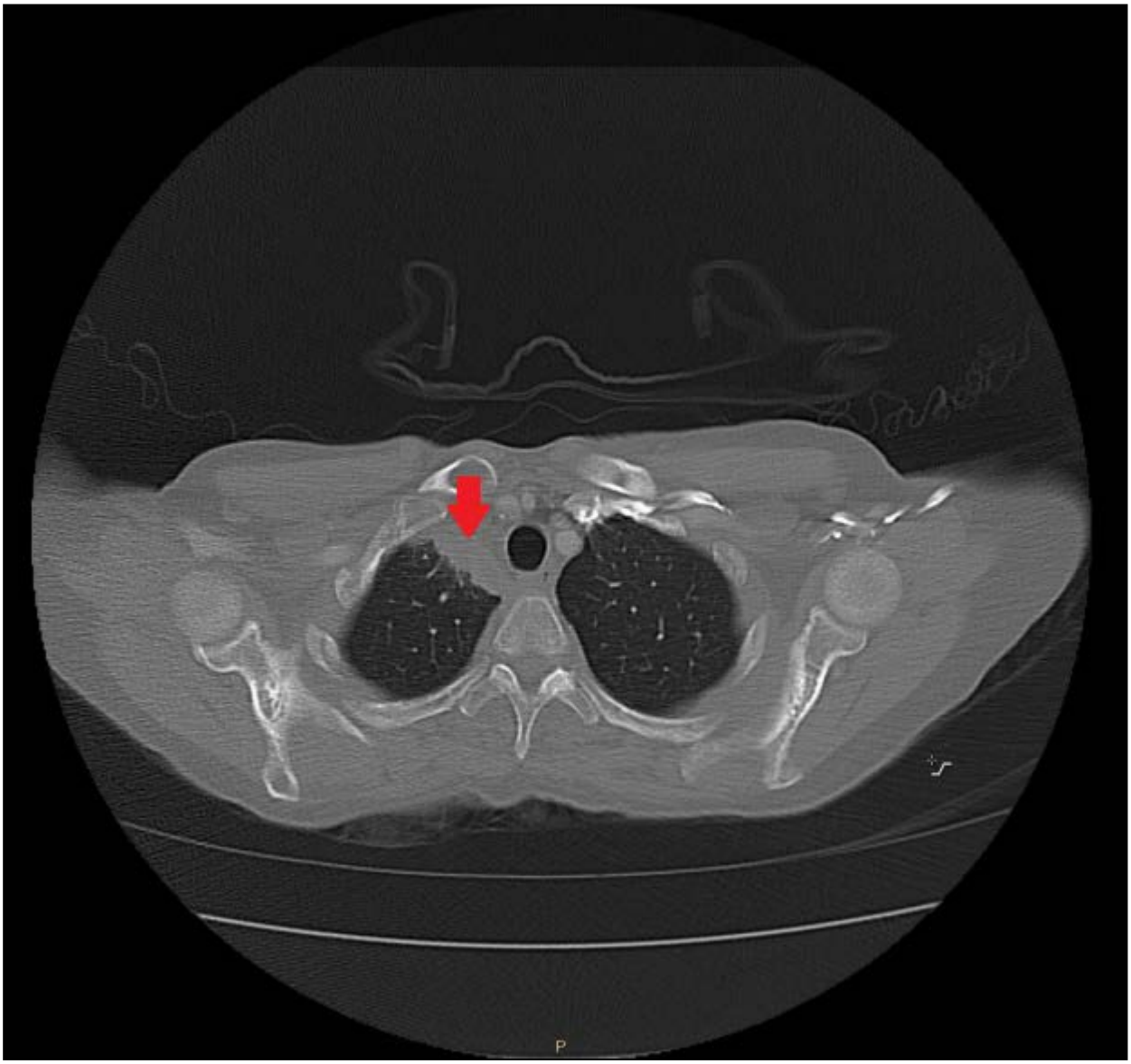

(228) Submission ID#458454

Clinical utility of mycobacterial culture and PCR by rinse fluid of EBUS needle in an intermediate tuberculosis-burden country

Submission Type: Poster Session ONLY

Submission Status: Complete

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
To evaluate the efficacy of mycobacterial culture and polymerase chain reaction (PCR) to tuberculosis (TB) by rinse fluid of endobronchial ultrasound (EBUS) needle for the diagnosis of intrathoracic TB lymphadenitis according to pre-procedure diagnosis.

Methods
A retrospective study was conducted on prospectively collected 4,795 patients who underwent EBUS transbronchial needle aspiration (TBNA). After obtaining the core tissue by EBUS-TBNA, rinse fluid of EBUS needle was routinely submitted for mycobacterial culture and TB-PCR assay. After grouping the patients according to pre-procedure diagnosis (Group A, patients with suspected or diagnosed lung cancer; Group B, patients with extrapulmonary malignancy; and Group C, others), we analyzed the add-on effect of mycobacterial culture and/or TB-PCR assay to histopathologic results by each group.

Results
Of 4,795 patients, 4,672 patients received all the tests of histopathologic examination using core tissue and mycobacterial culture and TB-PCR assay using rinse fluid. TB lymphadenitis was diagnosed in 0.2% (7/3,863), 1.0% (5/478), and 4.5% (15/331) of Group A, B, and C, respectively, by histopathologic findings only. When adding results of mycobacterial culture to histopathologic findings, proportion of TB lymphadenitis was more greatly increased to 1.0%, 4.4%, and 10.3% and number needed to test (NNT) was less required as 129, 30, and 18 in Group A, B, and C, respectively, than when adding results of TB-PCR assay to histopathologic findings (proportion of TB lymphadenitis was increased to 0.4%, 1.9%, and 8.8% and NNT was required as 552, 120, and 24 in Group A, B, and C, respectively). Finally, when using all the tests, TB lymphadenitis was diagnosed in 1.0% (40/3,863), 4.4% (22/478), and 12.7% (34/331) of Group A, B, and C, respectively.

Conclusions

Routine mycobacterial culture by rinse fluid could be useful to diagnose the TB lymphadenitis in an intermediate TB-burden country. However, routine TB-PCR assay by rinse fluid could not be useful in patients with suspected or diagnosed lung cancer and extrapulmonary malignancy.

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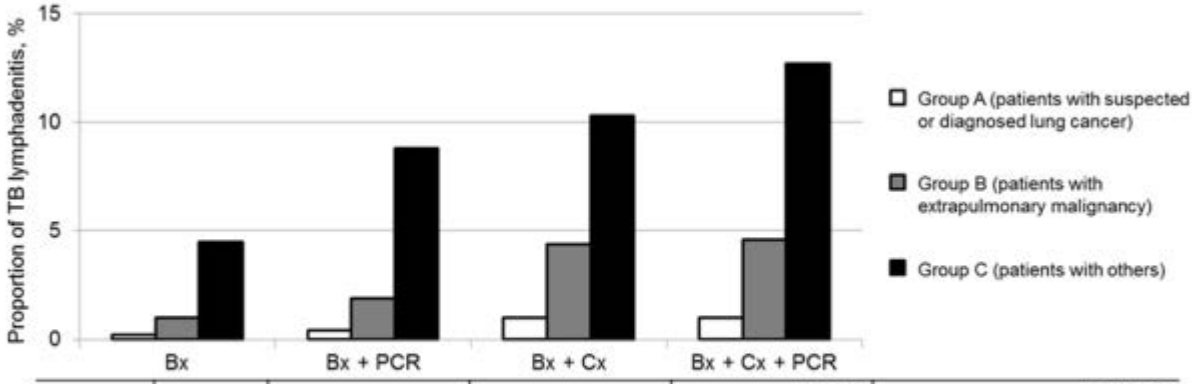
Figure. Add-on effect of diagnostic method on TB lymphadenitis. Bx, histopathologic findings compatible with TB infection (chronic granulomatous inflammation with caseous necrosis); Cx, positive AFB culture by rinse fluid of EBUS needle; PCR, positive TB-PCR assay by rinse fluid of EBUS needle. TB, tuberculosis; AFB, acid-fast bacilli; EBUS, endobronchial ultrasound; NNT, number needed to test.



	Bx	Bx + PCR	NNT for 'Bx' *vs* 'Bx + PCR'	Bx + Cx	NNT for 'Bx' *vs* 'Bx + Cx'	Bx + Cx + PCR	NNT for 'Bx + Cx' *vs* 'Bx + Cx + PCR'	*P* value for 'Bx' *vs* 'Bx + PCR'	*P* value for 'Bx' *vs* 'Bx + Cx'	*P* value for 'Bx + Cx' *vs* 'Bx + Cx + PCR'
Group A	0.2% (7/3,863)	0.4% (14/3,863)	552	1.0% (37/3,863)	129	1.0% (40/3,863)	1288	0.126	<0.001	0.820
Group B	1.0% (5/478)	1.9% (9/478)	120	4.4% (21/478)	30	4.6% (22/478)	478	0.281	0.001	0.876
Group C	4.5% (15/331)	8.8% (29/331)	24	10.3% (34/331)	18	12.7% (42/331)	42	0.029	0.005	0.329

(229) Submission ID#476545

Comparison of 22-gauge and 25-gauge aspiration needle during endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA)

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Takahiro Ota – Department of Thoracic Oncology, National Cancer Center Hospital East

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Disclosure: Nothing to Disclose

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) has typically been performed using the 22gauge (G) dedicated TBNA needle. Recently a new 25G TBNA needle has been introduced. The efficacy of using a smaller gauge biopsy needle during EBUS-TBNA has been unclear. The purpose of this study was to compare the diagnostic yield and utility of 22G and 25G needles during EBUS-TBNA.

Methods
From October 2016 to April 2017, patients who has mediastinal lymph node enlargement with a minor axis of 10mm or more with suspected lymph node metastasis of malignant tumor underwent EBUS-TBNA using either 22G or 25G needles (Boston Scientific, M00558220 or M00558250) in National Cancer Center Hospital East. To compare the diagnostic utility of each needle, the differences of the cytological and histological findings from the different size needles from each specimen were analysed.

Results
Forty five patients performed EBUS-TBNA using either 22G or 25G (22G/25G/combination usage=28/16/1). There were 88 punctures in the 22G group, while the 25G group had 45 punctures. The number of punctures of each lymph node was as follows (22G:2R/4R/7/hilar=5/28/40/15, 25G:3p/4R/4L/7/hilar=3/28/2/5/7). Of the 88 punctures by the 22G group, 83% (73/88) provided histologic samples. In the 25G group, histologic samples were obtained in 84% (38/45). Among the samples obtained by 22G, malignant cells were included in 69% (61/88), whereas by 25G in 69% (31/45). For cytology, observed malignant cells within individual slides were 89% (25/28) in 22G group, 100% (16/16) in 25G group. A total number of patients who were performed EGFR mutation examination was 31 of 45 cases, and the rate of successful analysis in 22G group was 95% (20/21), it was 100% (10/10) in 25G group. Next-generation sequencing was performed in 18 patients (22G/25G/combination usage=13/4/1) and all were analyzable. There were no serious adverse events.

Conclusions

There were no differences in the diagnostic yield between the 22G and 25G needles during EBUS-TBNA. Further evaluation of the usefulness of both 22G and 25G needles is warranted by prospective comparison study.

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(230) Submission ID#457952

Conservative management of extensive tracheobronchial injuries: report of two cases

Submission Type: Case Report

Submission Status: Complete

Submitter: Paolo Albino Ferrari – "A. Businco" Cancer Center - Azienda Ospedaliera Brotzu - Cagliari - Italy

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No financial relationships or conflicts of interest.

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Tracheobronchial injuries are encountered with increasing frequency because of improvements in pre-hospital care. They are caused by blunt and penetrating trauma, or they are iatrogenic, appearing after intubation or tracheotomy. In such cases early recognition and expedient appropriate management are essential. Primary initial goals are to stabilize the airway and localize the injury and then determine its extend. The selection of the manner and time of approaching depends on the existence and severity of additional injuries. Although the best treatment is still object of debate, recent reports show that conservative approach can be considered as a valuable alternative to the well-established surgical treatment.

Case Report
Herein, we report two patients with extended tracheobronchial tears. The male one presented a double penetrating blade trauma involving the anterior tracheal wall and the membranous part (4 centimeters), with concurrent laceration of oesophagus adventitia. The female one showed a post-intubation single wide tear of trachea and right main bronchus membranous part (7 centimeters), with esophageal wall injury and herniation. In our cases, a common findings was progressive subcutaneous and mediastinal emphysema, and limited bilateral pneumothorax. The female patient underwent oesophageal stent positioning while the male patient was treated with double chest drainage and surgical stab-wound repair. Patients were managed with intubation and mechanical ventilator care. We bypassed the lesions with endotracheal tube to avoid an increase in air leakage into the mediastinum and pleura. After about ten days of conservative treatment and strict endoscopic monitoring, a complete tracheobronchial wall healing was achieved (Image 1). Under broad-spectrum antibiotic therapy, no mediastinitis occurred and all patients survived without sequelae.

Conclusion
Tracheobronchial laceration is a potential life-treatining condition requiring prompt diagnosis and treatment. Depending on lenght and depth, the best treatment is case-specific; some authors recommend surgery while other do not definitely exclude conservative management. Operative approach based on strict clinical and endoscopic criteria as stable vital signs, effective ventilation, fixed and safe oesophageal injuries, no signs of sepsis, or evidence of major communication with the mediastinal space, enables favorable results to be achieved in selected patients.

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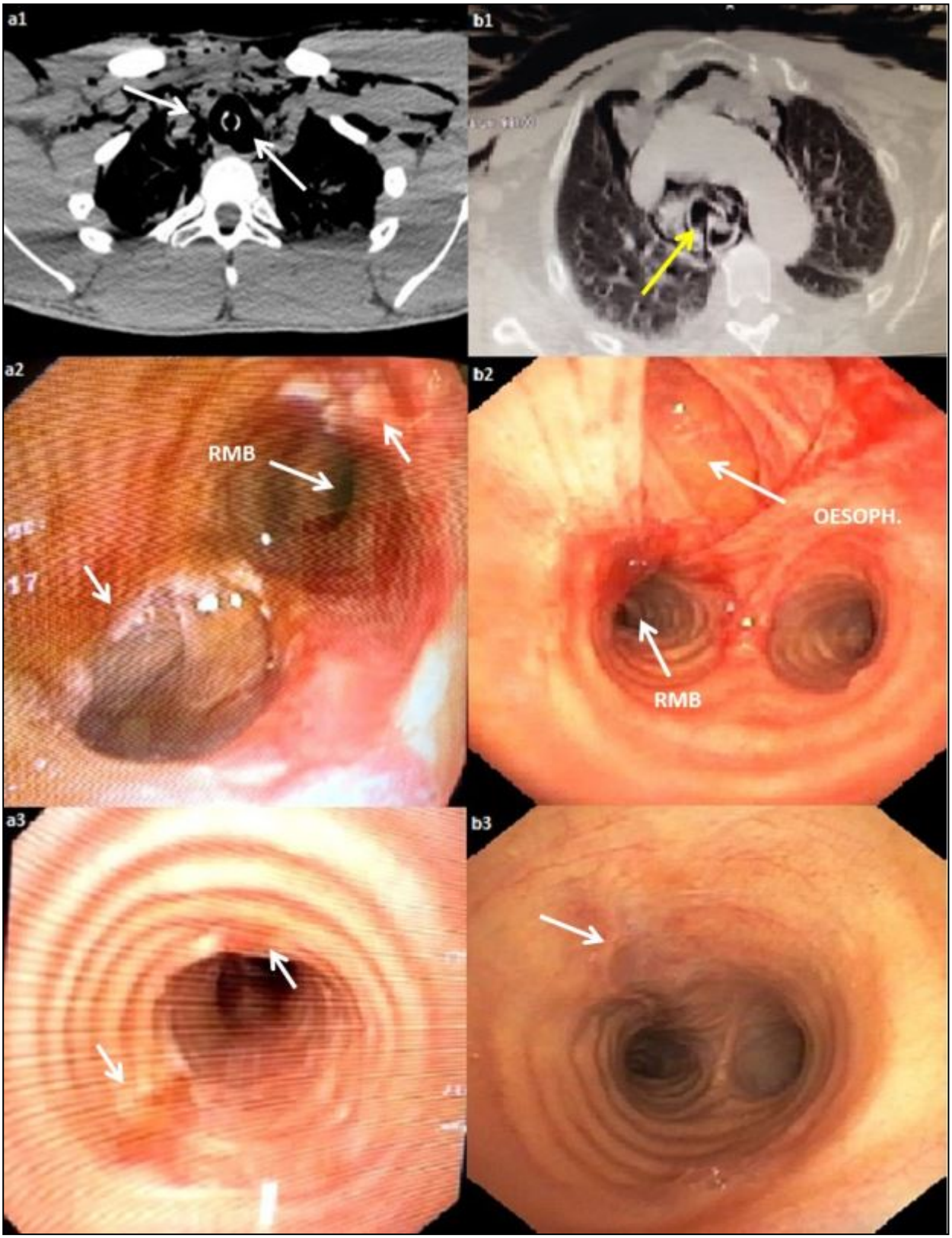

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Conservative management in tracheal injuries.ppt

(231) Submission ID#477064

Diagnostic Yield Factors of Endobronchial Ultrasonography with a Guide Sheath for Peripheral Lung Cancer: A retrospective study

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Nobuhiko Saijo – National Hospital Organization Kinki-chuo Chest Medical Center, Japan

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
Endobronchial ultrasonography with a guide sheath (EBUS-GS) has been a useful diagnostic tool to improve diagnostic yield for peripheral lung cancer. In recent years, the effectiveness of EBUS-GS has been reported, however there are few studies on the effectiveness of the introduction of EBUS-GS. We retrospectively analyzed the factors associated with diagnostic yield of EBUS-GS for peripheral lung cancer.

Methods
The medical record of 1026 patients in our institution from April 2012 to March 2016 were reviewed. The subjects of the study were 145 patients with pulmonary peripheral lesions who underwent EBUS-GS (EBUS-GS (E) group), and they were compared with a historical control group of 881 patients who underwent bronchoscopy under conventional fluoroscopy (Fluoroscopy (F) group). Rapid on-site evaluation (ROSE) has

been examined in both groups.

Results
The diagnostic yield of lesions was 76.5% in the E group and 85.2% in the F group. Moreover, the diagnostic yield of detectable lesions by X-ray was 90.3% in the E group and 93.7% in the F group. The mean lesion size was 21.6 mm in the E group and 34.6 mm in the F group, and there was a significant difference ($p<0.0001$). There was no significant difference between two groups in age, sex, lesion size of under 20 mm, or procedure time of under 30 minutes.

Conclusions
Although there was no significant difference about diagnostic yield between two groups, detectable lesions by X-ray were the most important factor for improved diagnostic yield by performing of bronchoscopy with EBUS-GS for peripheral lung cancer.

(232) Submission ID#458400

Endobronchial Leiomyoma - the Unicorn of Benign Bronchial Tumors

Submission Type: Case Report

Submission Status: Complete

Submitter: Dhaval Thakkar – Lahey Hospital and Medical Center

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Pulmonary leiomyomas account for less than 2% of all benign pulmonary tumors and of those only 33% occur in the bronchi, while the majority, 51%, occur in the parenchyma. To date there are only case reports and small case series describing different techniques used for endobronchial resection. Early studies mention the

need for surgical intervention requiring thoracotomy while more recent studies report successfully using less invasive bronchoscopic techniques. Anecdotally tumor recurrence has been noted to be low. A previous case series of 11 patients, who underwent bronchoscopic resection using neodymium:yttrium-aluminum-garnet (Nd:YAG) laser therapy, showed that one patient had tumor recurrence in 17 months and two other patients had incomplete removal, requiring surgery. We present the first case, to our knowledge, utilizing bronchoscopic application of neodymium:yttrium-aluminum-perovskite (Nd:YAP) laser resection of an endobronchial leiomyoma.

Case Report

The patient is a 22 year old male that was found to have an incidental finding of left mainstem endobronchial lesion noted on a chest computed tomography (CT) scan. He has a history of childhood asthma that is well controlled, borderline hypertension, and obesity. He underwent flexible bronchoscopy to better visualize the lesion. The vascular appearance of the lesion was concerning for a carcinoid tumor and further consultation was obtained. Due to the vascularity and the broad-based appearance of the lesion there was concern the patient may need a sleeve resection. Interventional pulmonology performed both a diagnostic and therapuetic rigid bronchoscopy. The lesion was noted to be a 1 cm pedunculated polypoid lesion with a broad-based stalk located 3.5cm distal to the main carina and 2cm proximal to the bifurcation of the left upper and lower lobe in the left mainstem (see image). Nd:YAP laser was successfully used to remove the lesion in its entirety without complication. The procedure was very well tolerated and the patient was discharged home. Histologically the lesion was described as a subepithelial spindle cell tumor with immunohistochemical staining being consistent with a diagnosis of leiomyoma. He remains without recurrence eight years since the original diagnosis.

Conclusion

Endobronchial leiomyomas are one of the most rare benign pulmonary tumors. Case reports and case series over the last few decades suggest that a bronchoscopic approach to managing these tumors can be successful and may prevent the need for a more invasive surgical intervention in a young patient. Additionally, the use of endobronchial laser resection may reduce the risk of hemorrhage due to the excellent coagulation properties.

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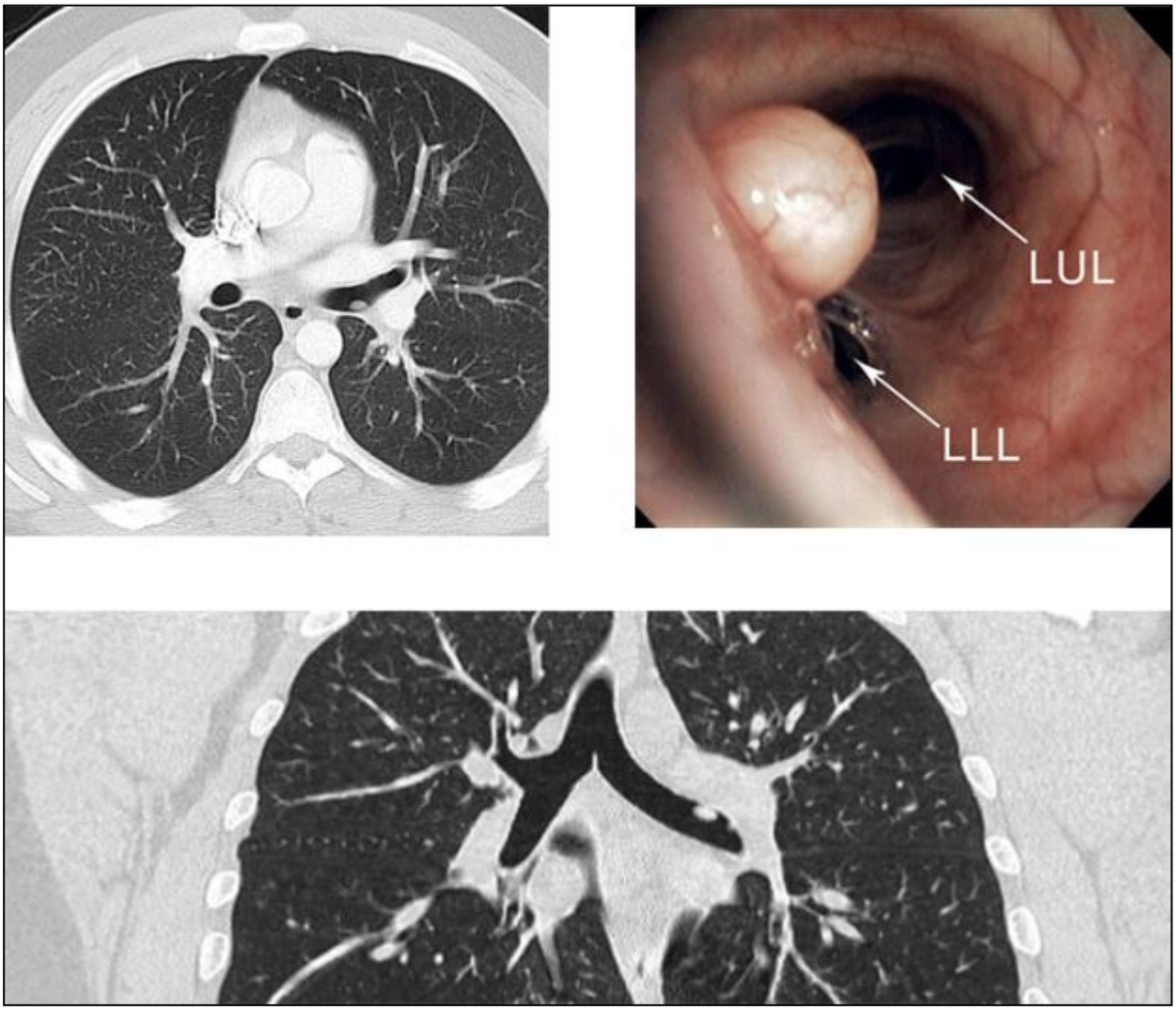
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(233) Submission ID#477093

Establishment of two animal models of benign airway stenosis

Submission Type: Oral and Poster

Submission Status: Complete

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Disclosure Status: Complete

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Tracheobronchology

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Background
Benign airway stenosis is the airway stricture caused by the destruction of the airway wall of various nonmalignant tumors. As tracheal intubation and airway stents are widely used for the treatment of critically ill patients, the cases of airway stenosis have increased gradually.
The animal models of benign airway stenosis were established by endotracheal intubation and stent implantation. We compared the difference of airway stenosis models established by these two methods, so as to provide a benign airway stenosis model for clinical research in the future.

Methods
6 beagle dogs were randomly divided into group A and group B. Each group had 3 beagle dogs. The dogs in group A were modeled by tracheal intubation, and the dogs in group B were built by stent placement. Group A: 3 beagle dogs were intubated through oral trachea after general anesthesia, and the pressure of the capsule was 200mm Hg for 24 hours. Group B: endotracheal covered self - expanded metal stents were placed after general anesthesia in 3 beagle dogs. The two groups were examined by bronchoscopy on first day, seventh day, fourteenth day and twenty-first day after modeling, respectively, and pathological changes were observed on twenty-first day.

Results
All the experimental dogs were able to recover successfully. Group A: the pathological results showed that the granulation tissue in the endotracheal cavity was obviously proliferated and the tracheal cartilage was narrowed, and the stenosis was 21~64%. Pathological results showed that the tracheal ciliated cells were missing, the lamina propria was inflammatory cell infiltration, some cells were degenerated and necrotic, and the collagen fibers increased. Group B: polypoid dysplasia appeared on the stent port. The stenosis degree was 36~47%. Pathological results showed that the mucous ciliated columnar cells were replaced by squamous cells, a large number of plasma cells infiltrated in the lamina propria, mucus glands increased, collagen fibers proliferated, some cells degenerated and necrotic, the cartilage membrane was intact, and no obvious necrosis was found in chondrocytes.

Conclusions
1. Through the tracheal intubation balloon, the inflated pressure of 200mmHg lasted for 24 hours. After 3 weeks, the structure of the trachea was damaged and the granulation tissue was proliferated. A stenosis model with tracheal contracture can be formed.
2. Through the coated metal stent with a diameter of 20mm and a length of 50mm in the trachea, the airway stenosis model based on granulation tissue could be formed after 3 weeks.

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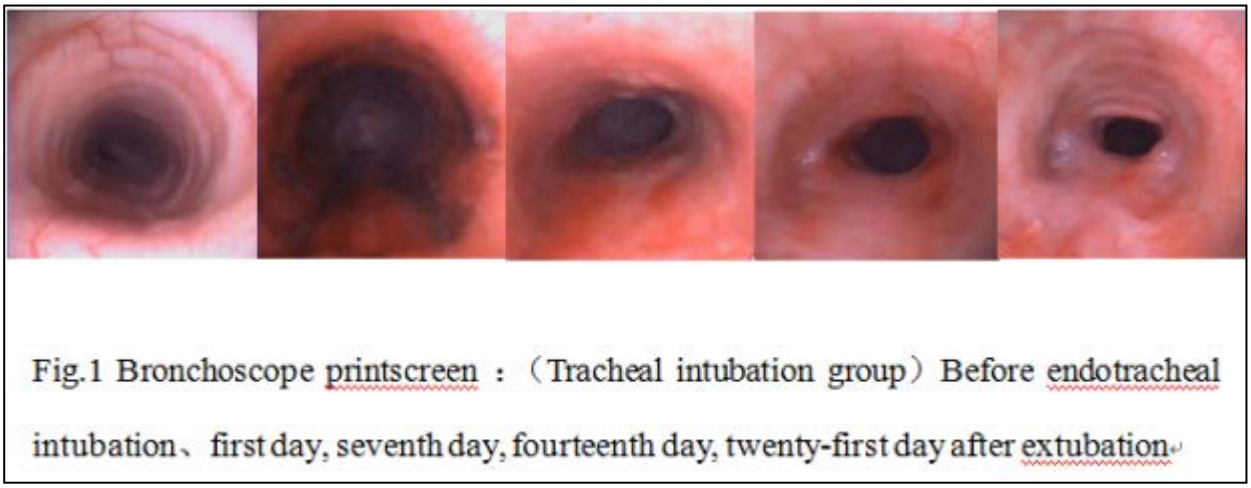

Fig.1 Bronchoscope printscreen ：（Tracheal intubation group）Before endotracheal intubation、first day, seventh day, fourteenth day, twenty-first day after extubation

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(234) Submission ID#476865

Evaluation of Airway Wall Thickness in Severe Asthma with Monoclonal Antibodies

Submission Type: Oral and Poster

Submission Status: Complete

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- No

Background
In Japan, the anti-IgE monoclonal antibody omalizumab and anti-IL-5 antibody mepolizumab have been approved as step 5 treatments in the global strategy for asthma management and prevention 2017 (GINA 2017). This study aims to evaluate bronchial thickness by high-resolution computed tomography in step 5 patients with monoclonal antibodies.

Methods
Nine severe asthma patients with monoclonal antibodies were evaluated. The ratio of bronchial wall thickness to bronchial lumen diameter (T/D), and percentage airway wall area (WA%) were calculated before and after the treatment.

Results
Thirty-four subjects (18.5%) required step 5 treatment, with 25 subjects required add-on treatments. We administered omalizumab in 12 patients and mepolizumab in 4 patients. Of the 16 patients receiving monoclonal antibodies, 9 retrospectively underwent HRCT before and after the treatment. The ratio of bronchial wall thickness to bronchial lumen diameter (T/D), and percentage of airway wall area (WA%), were calculated at 6 selected levels: the superior margin of the aortic arch, 1cm above the carina, carina, 1cm below the carina, the level of inferior pulmonary veins, and 2cm above the diaphragm. Both T/D and WA% significantly decreased after monoclonal antibody treatment. The mean (SD) T/D for patients before and after the treatment were; 0.16 (0.05) and 0.13 (0.05) (p=0.006); and the mean (SD) WA% were 52.8 (14.7) and 45.5 (14.7) (P =0.007), respectively.

Conclusions
T/D and WA% were significantly decreased after treatment with monoclonal antibodies.

(235) Submission ID#375452

Flexible Bronchoscopy Assisted with Noninvasive Ventilation for Therapy of Hypoxemic Patients with Central Airway Obstruction

Submission Type: Oral and Poster

Submission Status: Complete

Submitter: Xiaoke Chen – Respiratory Department,The Eighth Affiliated Hospital,Sun Yat-sen University

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Disclosure Status: Complete

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The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background
Interventional bronchoscopy for hypoxemic patients with central airway obstruction(CAO) is typically performed under general anesthesia. This approach poses remarkable challenge for both bronchoscopist and anesthesiologist. Noninvasive ventilation (NIV) during FB (flexible bronchoscopy) has been successfully used in hypoxemic patients, but rarely in the treatment of hypoxemic patients with CAO. This study evaluated the feasibility of therapeutic FB assisted with NIV for hypoxemic patients with CAO.

Methods
Hypoxemic CAO patients treated with FB over a 5-year period were retrospectively reviewed, either aided with NIV under sedation (NIV group) or through artificial airway under general anesthesia (control group). Interventional procedures included balloon dilation, electrocautery and argon plasma coagulation.

Results
Twenty-nine patients (15 in the NIV and 14 in the control group) were enrolled. There were no significant differences in success rate (93.3% VS 92.9%, p=1.0), procedure time (60.5 ± 4.2min VS 67.8 ± 5.6min, p=0.31) and oxygenation improvement between the two groups. Less reduction of systolic blood pressure and heart rate during procedure was observed in NIV group. The NIV group showed less admission hours before procedure than the control group (35.1± 4.6h vs 55.6 ± 5.6h, p<0.01). Procedure fee in the NIV group was significantly less than that of the control group (540.7 ± 62.8$ VS 975.4 ±69.5$, p<0.0001).

Conclusions
FB assisted with NIV is safe, efficient and economic for the therapy of selected hypoxemic patients with CAO.

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(236) Submission ID#451646

Fungal Asphyxia

Submission Type: Case Report

Submission Status: Complete

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

Mucormycosis as a soft tissue lesion involving trachea is very rare. While pulmonary mucormycosis per se has 50%-80% mortality, additional airway compromise can be more lethal in tracheal mucormycosis. We report a case of tracheal mucormycosis with stridor and asphyxia where a successful bronchoscopic and

medical management saved the patient.

Case Report

A 30 years old diabetic female presented with cough, breathing difficulty for 15 days and stridor for 3 days. Her Spo2 in room air was 97% in sitting and supine while it dropped to 85% in left lateral position. While her chest X ray was normal, HRCT lungs showed a soft tissue density in the lower trachea and carina. Flexible bronchoscopy showed granulation from both the lateral walls of lower trachea and a mobile necrotic soft tissue lesion arising from carina and both main bronchial origin, moving upwards in to the tracheal lumen. Biopsy showed invasive mucormycosis. While preparing for a rigid bronchoscopy, she developed respiratory distress and hypoxia and she was intubated. Ventilation was difficult due to high peak airway pressures and low tidal volume (<200 ml). As she could not tolerate rigid bronchoscopy, a 4.5 size endotracheal tube introduced to the left main bronchus and flexible bronchoscope introduced besides the endotracheal tube.With multimodality approach using Cryo probe, argon plasma coagulation(APC) and electro cautery, lesion was debulked in small pieces. During procedure patients Spo2 was around 90%, she had bradycardia twice and resuscitated. At the end of the procedure, a reasonable tracheobronchial lumen became patent, tidal volumes were around 300 ml, but patient had worsening hypoxia and hypotension, developed acute lung injury and she was proned for ventilation with inotropic supports for 48 hrs. She was extubated after 3 days and continued amphotericin B therapy for 4 weeks. Repeat bronchoscopy was done in 7 days interval for 4 times and the re growing granulation was debulked with APC and Cryo. she is currently doing well on 8th week follow up with posaconazole salvage therapy and the last biopsy was negative for aseptate hyphae.

Conclusion

High end of suspicion and prompt diagnosis is vital in tracheal mucormycosis. Our case is the first one to our knowledge to involve trachea, carina and bronchus altogether where surgical reconstruction is difficult. Bronchoscopic debridement with amphotericin therapy could be a option in these cases but needs long term follow up for a definite conclusion.

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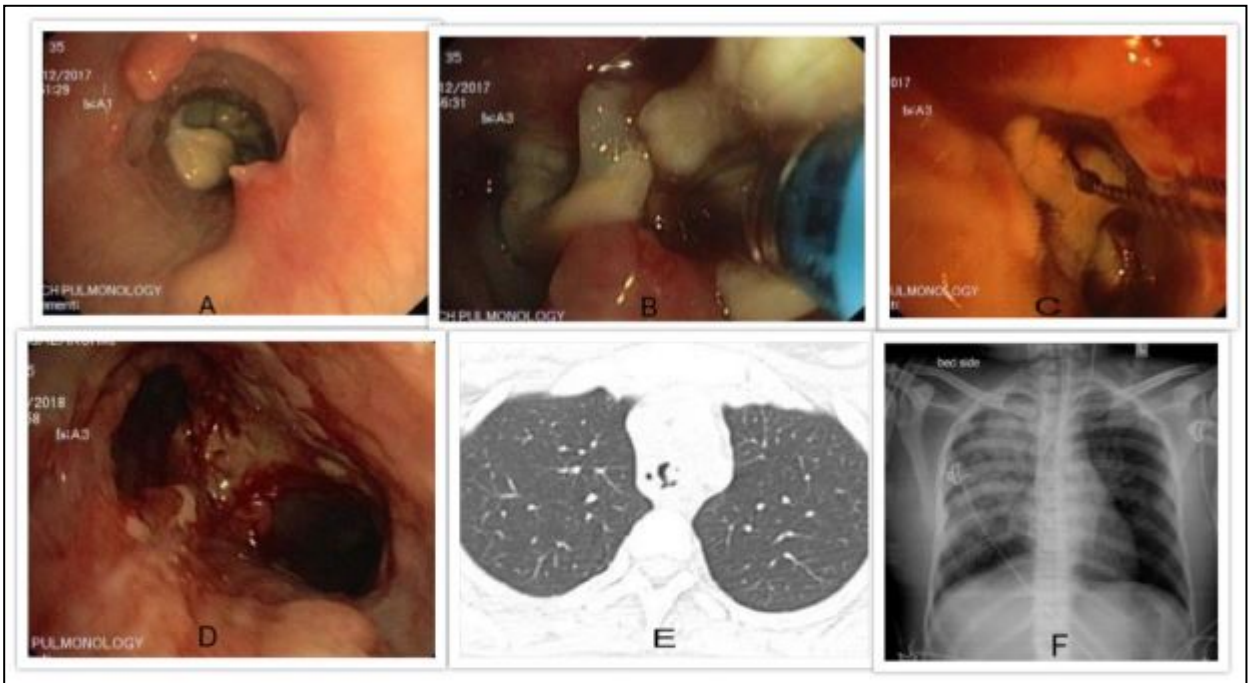

Figure 1
A – Nodular granulation and necrotic soft tissue in lower trachea
B – Cryo debulking
C – Snare electro cautery
D – Carina after debulking the lesions
E – CT scan showing tracheal luminal narrowing
F – Chest X-Ray showing right predominant Lung injury immediate post procedure

(237) Submission ID#459586

Is there a connection between bronchoscopy findings and radiographic stage of sarcoidosis?-our experience

Submission Type: Oral Presentation ONLY

Submission Status: Complete

Submitter: Spasoje Popevic – University Hospital of Pulmonology, Clinical Center of Serbia, Belgrade

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background
Complex pathogenetic basis of the sarcoidosis is resulting in non existence of unique diagnostic test for sarcoidosis. Diagnosis of sarcoidosis is made by combining different tests and in that setting, endoscopic finding is often considered as less important than histologic confirmation.

Methods
Observational (descriptive) clinical study (cross-sectional study) was performed in University Hospital for Pulmonology of Clinical Center of Serbia from 01.02.2012-31.12.2015. The prospective analysis included 571 patient with histologically proven sarcoidosis (by bronchoscopic biopsy). Endoscopic finding in regard of radiographic stage was analyzed.

Results
Bronchoscopic finding was pathologic in 495 pts (86.5%). Extramural compression, as a result of lymph node enlargement was observed in 377 pts (66%), hyperemic mucosa with submucosal injection in 467 (81.8%) of pts, and whitish nodules on mucosa in only 14,7% (84 pts).
Majority of our patients were in radiographic stage 1 of sarcoidosis (445-77.9%), in stage 2 there were 116 (20.3%) of pts, in stage 3-9 pts (1.6%) and in stage 4 only one patient (0.2%).
Distribution of pts by endoscopic finding in relation to radiographic stage is shown in table 1.(table 1)
Extramural compression is significantly more frequent in stages 1 and 2 ($p<0.002$), same as hyperemia and submucosal injection, while whitish nodules were significantly rare ($p<0.002$).
There is a highly significant correlation of endoscopic finding and radiographic stage of sarcoidosis(p0.005)
Majority of patients had abnormal bronchoscopic finding, regardless of radiological stage.

Conclusions
Bronchoscopic finding, in light of its corelation with radiographic stage of disease can be perceived as the reflection of disease pathogenesis

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Table 1. Bronchoscopic finding by radiographic stages of sarcoidosis

Bronchoscopic finding		Radiographic stage			
		I (N=445)	II (N=116)	III (N=9)	IV (N=1)
		n (%)	n (%)	n (%)	n (%)
Extramural compression	Yes	300 (67.4)	70 (60.3)	3 (33.3)	0 (0.0)
	No	145 (32.6)	46 (39.7)	6 (77.7)	1 (100.0)
Hyperemia	Yes	361 (81.1)	97 (83.6)	1 (11.1)	0 (0.0)
	No	84 (18.9)	19 (16.4)	8 (88.9)	1 (100.0)
Whitish nodules	Yes	69 (15.5)	15 (12.9)	0 (0.0)	0 (0.0)
	No	376 (84.5)	101 (87.1)	9 (100.0)	1 (100.0)
Normal finding	Yes	62 (13.9)	13 (11.2)	1 (11.1)	1 (100.0)
	No	383 (86.1)	103 (88.8)	8 (88.9)	0 (0.0)

(238) Submission ID#478017

Malignant bronchial ulcer with coexistent Pulmonary TB and COPD

Submission Type: Case Report

Submission Status: Complete

Submitter: Yuvarajan Sivagnaname – Sri Manakula Vinayagar Medical College& Hospital,Puducherry

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

Ulcerations in the bronchial mucosa is noted rarely in bronchoscopy .In olden days , it is frequently encountered in Endobronchial tuberculosis .However ulcers in those condition are usually superficial .Deep necrotic bronchial ulcers are seen very rarely in clinical practice.Here we are reporting a case of poorly differentiated bronchogenic carcinoma presenting with a necrotic deep bronchial ulcer on bronchoscopy.

Case Report

70 year old male,chronic smoker came to the hospital with complains of breathlessness for 3 months,cough for 3 month,loss of weight and appetite for 1 month.Initially evaluated by a general practioner adviced for chest x ray and referred to our hospital.Patient was admitted and investigated further.on general examination, patient was thin built poorly nourished with grade 3 clubbing.Respiratory system examination revealed bilateral end expiratory wheeze with crepitations in right infra axillary area. Chest X ray showed diffuse heterogenous opacity involving bilateral lung fields.CT thorax was done which showed nodular lesions in Right upperlobe with mediastinal necrotic lymph nodes and also shown the evidence of peribronchial thickening at the level of intermediate bronchus.Sputum AFB and gram stain was done which was inconclusive.Bronchoscopy was planned which showed large necrotic ulcer with dense anthrocotic pigmentation with unhealthy bronchial mucosa at the secondary carina between right upper lobe bronchus and bronchus intermedius which bleeds on touch with forceps.Bronchial washings, brushings,endobronchial biopsy was taken from the ulcer which showed the feautures of poorly differentiated bronchogenic carcinoma .BAL for AFB smear was positive .TBNA from the mediastinal nodes showed the feautures of granulamatous lymphadenitis.patient was diagnosed to have poorly differentiated bronchogenic carcinoma with coexistent pulmonary TB and COPD.Patient was started on anti tubercular drugs with inhaled bronchodilators and refered for oncologist opinion for chemotherapy.

Conclusion

Eventhough clinicoradiological features suggests tuberculosis,malignancies can coexists with tuberculosis should be kept in mind while evaluating the patient.Bronchogenic carcinoma can rarely present with deep bronchial ulceration.

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(239) Submission ID#458417

Mass-like pulmonary tuberculosis mimicking lung cancerA case report

Submission Type: Case Report

Submission Status: Complete

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Tracheobronchology

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Background
Lung cancer and pulmonary tuberculosis are both leading causes of death worldwide. Although these are major public health challenges around the world, treatment and prognostic outcomes for these two diseases are completely different. Delay in diagnosis is often a factor responsible for high mortality, which necessitates prompt and accurate identification of both lung cancer and tuberculosis or pulmonary tuberculosis. There are varying types of presentations for pulmonary tuberculosis, and unusual cases simulating lung cancer have been reported. Here we described a case of a patient with mass-like pulmonary tuberculosis that was initially believed to be lung cancer. The condition was eventually correctly diagnosed as pulmonary tuberculosis using transbronchial biopsy.

Case Report
A 44-year-old man presented with persistent cough and chest pain to respiratory division of our hospital. Chest radiograph revealed nodular opacities in the right upper-lung field and a mass-like opacity in the left lower-lung field. Computed tomography scan of the thorax revealed centrilobular nodules in the left upper-lobe and mass-like opacity in the left lower-lung lobe along with pleural thickness and irregular intra-mass calcification. An acid-fast bacillus stain of sputum tested negative; however the subsequent culture was positive. Malignant cells were not detected on sputum cytology. A transbronchial biopsy of the left lower-lung lobe was performed using a flexible bronchoscope. Pathological examination of biopsy specimen revealed a granulomatous inflammatory response with acid-fast bacilli. Therefore, a definitive diagnosis of mass-like pulmonary tuberculosis was established. Antituberculotic therapy was administered. The patients symptoms diminished during therapy; however, opacities remained on his chest radiogragh.

Conclusion
Pulmonary tuberculosis cases simulating lung cancer are inevitable in clinical practice including lung diseases. Because these two diseases share similar findings, it may be difficult to distinguish mass-like tuberculosis from lung cancer based only on radiological and clinical assessment. It is critical to obtain histological or microbiological specimens to establish a definitive diagnosis. Bronchoscopic examination remains the preferred diagnostic modality because not only the lumen of bronchial trees can be observed but also pathological or bacterial specimens can be obtained with few complications.

(240) Submission ID#459576

Mounier-Kuhn syndrome or tracheobronchomegaly: three case report and literature review

Submission Type: Oral and Poster

Submission Status: Complete

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Tracheobronchology

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Background
To improve the knowledge of tracheobronchomegaly (TBM, Mounier-Kuhn syndrome).

Methods
Three patients with TBM were analyzed, and the related literatures were reviewed.

Results
TBM was an extremely rare disease, although the etiology was unknown, most s cholars believed that TBM was a congenital disorder. TBM was characterized by a congenital defect or atrophy of the elastic and smooth muscle tissue of th e trachea and main bronchi. Pulmonary function tests showed obstructive venti latory dysfunction. The onset of TBM was slowly, and its most usual clinical manifestations included recurrent cough and sputum, and progressive dyspnea. Given then on-specific clinical pattern, the misdiagnosis rate of TBM is probably higher. High-resolution CT scan of the chest was used for the diagnoses, whic h showed the trachea and the main bronchi marked dilatation. Treatment was mainly supportive with chestphysiotherapy and antibiotics.

Conclusions
TBM should be considered for patients who have recurrent pulmonary infection. A careful analysis of the chest radiograph of the sepatients is required. Raising wareness of the disease, it is important to help the disease diagnosis.

(241) Submission ID#477912

Multimodal bronchoscopy diagnostics and treatment of the early central lung cancer

Submission Type: Poster Session ONLY

Submission Status: Complete

Submitter: Dmitry Sokolov – P.A. Herzen Moscow Oncological Research Institute - division of National Medical Scientific Radiological Center

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

The objective of the given research is the developing and improving the bronchoscopy diagnostics and treatment techniques in case of occult early central lung cancer.

Methods

In our clinic, over the past 30 years it was examined more than 16 000 patients at high risk of lung cancer. From 1984 through 2016 176 of early central lung cancer (ECLC) was found in 128 patients. X-ray negative

ECLC was in 96% of patients. It was investigated possibilities of different variants of multimodal bronchoscopy (WLI, AFI, NBI, LFS, iHb, i-scane) and in immunocytochemical (MUC 1) diagnostics of ECLC in comparison with routine examination. In July 2015, in our clinic started experimental studies use confocal laser endomicroscopy and endocytoscopy in the diagnosis ECLC. All patients with ECLC (176 tumors) had been treated with endobronchial therapies (Nd:YAG laser, electrocautery, argon-plasma coagulation and photodynamic therapy).

Results
Sensitivity and specificity using a multimodal bronchoscopy to detect occult ECLC exceeded 90%. When using endobronchial therapies for ECLC complete response was observed in 157 of the 176 early carcinomas (89%), for tumors 1 cm in size complete response rate was 100%.

Conclusions
Multimodal endoscopical and immunocytochemical diagnostics increases the efficiency in detecting occult ECLC, while the suggested techniques of endobronchial treatment increase the number of cured patients.

(242) Submission ID#478009

Pneumoptysis ! Coughing out of lung -The first ever case report in the history of medicine

Submission Type: Case Report

Submission Status: Complete

Submitter: Yuvarajan Sivagnaname – Sri Manakula Vinayagar Medical College& Hospital,Puducherry

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

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Background

Herniation of lung tissue is rarely seen in literature that too in postoperative patients and among paediatric populations.Here We are going to report a case of coughing out of lung with massive hemoptysis which we wish to term as Pneumoptysis which is not reported till date in medical literature.

Case Report

70 year old female presented to the casualty with the history of cough for 1 month and hemoptysis for 2 days.Regarding the history of presenting Illness She had cough which was productive with mucopurulent sputum without any specific character or diurnal variation .she also had hemoptysis for 2 days around 50ml, 3 episodes in last 6 hours.No past history of pulmonary TB, No history of trauma.No history of exposure to

organic /inorganic dusts. On examination, she was poorly built and nourished, anaemic, tachypenic with Spo2 of 95% on room air.On respiratory system examination,coarse inspiratory crackles heard over bilateral infra scapular and infra axillary area. Investigations:Routine blood investigations revealed anaemia with leucocytosis. Arterial blood gas analysis showed respiratory alkalosis with hypoxemia .chest x ray showed heterogenous opacity in right upper zone with elevated right hemidiaphragm.Bleeding time,clotting time , prothrombin and partial thromboplastin time were within normal limits. Results and treatment:Patient was started on broad spectrum antibiotics with moist oxygen 4 lites per min via facemask along with hemostatics and other supportive measures.Suddenly patient had a bout of haemoptysis of around 500ml.While intubating ,the patient had another bout of haemoptysis of around 250 ml, along with that she coughed out a dark grey, spongy tissue.Patient immediately developed cardiac arrest and could not be revived. Histopathology examination of that dark spongy tissue showed lung tissue with most of the alveoli dilated, ruptured, confluent. Medical autopsy was planned however patients bystanders denied consent for autopsy .

Conclusion

To the best of our knowledge this is the first case ever reported on coughing out of ones own lung tissue, which we wish to term as Pneumoptysis.As the patients relatives were not willing for medical autopsy we could not find out the possibilities of coughing out of lung .This may be due to the expectoration of sequestrated lung or necrotic lung parenchyma following infective or inflammatory pathology .

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(243) Submission ID#458412

Potential benefits of amnion-covered stents in the setting on airway luminal compromise

Submission Type: Oral and Poster

Submission Status: Complete

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Disclosure Status: Complete

Disclosure: Does Disclose

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Peytant Solutions, Inc. (Consultant, Ownership Interest includes stock, stock options, patent or other intellectual property)

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Tracheobronchology

The Heinrich Becker Young Investigator Awards for Research and Clinical Innovation

- Yes

Background

Malignant and non-malignant stenosis may be treated with the use of metal, silicone, or hybrid stents. While stents can both improve and maintain luminal patency, complications such as mucus plugging, granulation tissue, migration, and infection are common. These complications often necessitate reintervention which can significantly impact cost and patient quality of life. Amniotic membrane grafts have been described as having a host of unique biologic characteristics including anti-inflammatory, antiviral, and antibacterial properties and

are currently used in ophthalmology, gynecology, plastic surgery, and other clinical settings.

Methods
In an attempt to improve traditional bronchial stent-related complications, an amnion-covered self-expanding nitinol stent was developed. The system, an initial design of the AMStent System (I-AMS), pairs the mechanical stability of a flexible nitinol frame with the unique properties of human amnion as its covering. Two ovine were implanted with the I-AMS in the trachea for 30 days.

Results
Inflammation, migration, and patency were assessed. In both animals, chronic patency was observed in regions where the amnion was intact and the stent struts were incorporated. Further, ciliated epithelium had formed with minimal inflammation and without the formation of granulation tissue.

Conclusions
With continued investigation, the favorable biological properties of amnion as a covering may address current airway stent shortcomings.

(244) Submission ID#457910

Preliminary report of the worlds first bronchoscopic findings with Linked Color Imaging (LCI)

Submission Type: Oral and Poster

Submission Status: Complete

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Disclosure:

Disclosure Status: Complete

Disclosure: Does Disclose

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