



Accepted Abstracts # 3 - 305 (All)

Abstract #3

Interventional bronchoscopy for stent placement by rigid bronchoscope through tracheostomy. A case reports

H. Anh Duc^a (Dr), VV. Giap^a (Pr), NN. Du^a (Dr)

^a *Bach Mai hospital, Hanoi, VIET NAM*

Introduction

Benign tracheal stenosis that is a debilitating and potentially life-threatening condition. Main causes including: long term of endotracheal intubation and/or tracheostomy; tuberculosis; burn injuries;...

Case report

A 34 year-old man admitted to the hospital because of dyspnea. Past medical history: Underwent a surgery to treat traumatic brain injury due to traffic accident 2 months ago. He was intubated and had a tracheostomy for 1 month in the postoperative period. After removing the tracheostomy cannula, the patient often had shortness of breath and stridor.

One day before admission, he had severe shortness of breath which led him to be intubated. The patient has been diagnosed: Scarring tracheal stenosis due to prolonged intubation with post-craniectomy for traumatic brain injury.

We decided to put the rigid bronchoscope through the tracheostomy with the collaboration of otolaryngologists. Finally, the silicone stent was put exactly in the tracheal through the rigid bronchoscope. After the procedure, the patient showed clinical improvement and extubation.

Discussion

The patient had a tracheal stenosis with acute complications of respiratory failure requiring endotracheal intubation to maintain ventilation. In addition, the patient also had brain damage that required surgery. Placing a rigid bronchoscope through the mouth will require head movement leading to the risk of brain damage. Placing a rigid bronchoscope through the tracheostomy avoids the need to move the patient's head and reduces the patient's risk of brain damage. In conclusion, interventional bronchoscopy is an efficient and safe modality in post-intubation tracheal stenosis management and in addition to the traditional oral approach.

Disclosure of funding source(s): none

Abstract #4

Endobronchial ultrasound - guided transbronchial needle aspiration (EBUS-TBNA) in diagnose mediastinal lymph-node and tumor: first descriptive study in Vietnam.

H. Anh Duc^a (Dr), NQ. Chau^b (Pr), VV. Giap^a (Pr), M. Hashimoto^c (Dr)

^a Bach Mai hospital, Hanoi, VIET NAM ; ^b Tâm Anh general hospital, Hanoi, VIET NAM ; ^c National Center for Global Health and Medicine, Tokyo, JAPON

Introduction: Mediastinal lesions such as tumors, lymph nodes may be primary or secondary lesions. Diagnosis and evaluation of these lesions have an important role in the treatment and prognosis, as in the case of mediastinal tumor, metastatic mediastinal lymph node. Difficulties on etiologic diagnosis due to inaccessible locations and previous invasive procedure with high risk of complication: thoracoscopy, mediastinoscopy, [computed tomography-guided lung biopsy](#). Endobronchial ultrasound bronchoscopy (EBUS) is a procedure of bronchoscopy combined with ultrasonic bronchial probe to evaluate as well as access to structures (tumors, lymph node).

Patients and Method: Pro-retrospective study was performed on 28 patients diagnosed with mediastinal tumor, lymph nodes undergoing endobronchial ultrasound bronchoscopy to biopsy at Respiratory Center, Bach Mai Hospital from July 2017 to August 2018. Research parameters have been collected before, during and after the intervention: clinical parameters (age, gender, length of hospital stay); parameters during procedure (biopsy location, complications) cytology and histopathology results.

Results: The mean age of the study population was 58, 6 years, female / male ratio was 1/6, mean hospitalization length was 11.6 days, and 19/28 study patients had a history of smoking. Biopsy sites of lymph node station were station 2 (14.3%); station 4 (64.3%); station 7 (32.1%); station 10 (7.1%); station 11 (3.5%). The cytological results showed that 7/28 patients had cancer cells, 2 necrotizing inflammation and 1 granuloma. Histopathological results: 39, 3% of patients (11/28) had cancer diagnosis (including epithelial carcinoma, small cell carcinoma, non-small cell carcinoma, squamous cell carcinoma, carcinoma); 7.1% were granuloma (2/28); 7.1% (2/28) were lymphoid inflamed lymph nodes; 28.5% (8/28) were chronic inflammatory lesions; 3/28 cases cannot be obtained the sample for histopathology. After intervention, the complication rate was 0%.

Conclusion: Endobronchial ultrasound bronchoscopy (EBUS) showed the important role and the safety in the etiologic diagnosis of mediastinal tumor and lymph node.

Disclosure of funding source(s): none

Abstract #5

Endobronchial ultrasound access to the vasculature: systematic review and analysis of the literature

E. Koukaki^a (Mlle), N. Anagnostopoulos^a (M.), V. Vitsas^b (M.), P. Emmanouil^b (M.), G. Stratakos^a (Pr)

^a *Interventional Pulmonology Unit of the 1st Respiratory Medicine Department National and Kapodistrian University of Athens. "Sotiria" General Hospital, Athens, Greece, Athens, GRÈCE* ; ^b *Interventional Pulmonology Unit of Mediterraneo Hospital, Athens, Greece, Athens, GRÈCE*

Background: EBUS allows to access the pulmonary vasculature. The aim of this review is to assess the role of EBUS for pulmonary embolism, non-thrombotic vascular lesions or vascular tumors, transvascular needle aspiration and T4 staging.

Methods: PubMed and SCOPUS databases were searched for articles in English language reporting the use of EBUS for the above indications. The search was performed up to November 2021.

Results: 112 articles were retrieved of which 44 were excluded. Another 13 articles were identified from reference lists. Finally, 77 articles were included in the study.

A new systematic approach for the detection with EBUS of pulmonary artery filling defects has been proposed. They were found in the literature 78 cases of pulmonary embolism. Moreover, 25 cases of non-thrombotic endovascular lesions were also identified and diagnosed by endobronchial ultrasonography. There have been 240 cases of transvascular needle aspiration for diagnosis of pulmonary or mediastinal lesions and 2 clinical studies of T4 staging with the aid of EBUS or b-EUS.

Conclusion: Cases reports of EBUS/EUS b assessing the vasculature are increasingly found in the literature. The combined endobronchial ultrasonography targeting the vascular or perivascular lesions could increase the diagnostic yield of this procedure with seemingly low complication rates.

Disclosure of funding source(s): none

Abstract #6

Early experience with endobronchial ultrasound-guided transbronchial needle aspiration in a thoracic surgery center

N. Martucci^a (Dr), G. De Luca^a (Dr), A. La Rocca^a (Dr), C. La Manna^a (Dr), E. Mercadante^a (Pr)

^a *Istituto Nazionale dei Tumori "Fondazione Pascale", Napoli, ITALIE*

BACKGROUND:

Endobronchial ultrasound with transbronchial fine needle aspiration (EBUS-TBNA) is recognized as a minimally invasive procedure for the diagnosis of mediastinal pathologies and has replaced the use of mediastinoscopy in thoracic surgery. EBUS is recommended as a first-choice procedure for mediastinal staging in lung cancer and lymph node neoplasms.

METHODS:

We evaluated the results on the initial experience of a single center with EBUS-TBNA in our thoracic surgery department. We started, after a training period, to perform EBUS-TBNA procedures on February 2021. Up to February 2022 we performed 80 procedures. The main indication for the procedure was suspected non-lymphomatous malignant tumor in the intrathoracic lymph nodes on computed tomography (CT) or positron emission tomography (PET) imaging. All procedures were performed under deep sedation in the operating room. All aspirated samples were obtained with a 22 gauge needle and were prepared on slides for cytology examination and fixed in 10% formalin for cell block. No complications related to the procedure were found

RESULTS:

From February 2021 to February 2022, 80 patients were submitted to EBUS-TBNA. Number of nodal stations punctured was 125 with a mean of 2.25 punctures per patient. Diagnosis of malignancy was obtained in 54 patients (67.5%) and in 8 cases a nodal metastasis from an extrathoracic primary tumor was diagnosed. Sensitivity, specificity and diagnostic accuracy were 94%, 100% and 95% respectively. Negative predictive value was 92% and positive predictive value (PPV) was 100%. When molecular tests were requested, mutational analysis was successfully performed on cell block derived material in 43 out of 45 cases (95.7%).

Disclosure of funding source(s): none

Abstract #7

Use of cryobiopsy-assisted videopleuroscopy in the diagnosis of pleural mesothelioma - preliminary reports

J. Pieróg^{*a} (Pr), W. Głazek^a (Dr), K. Safranow^a (Pr), K. Ptaszyński^a (Pr), J. Wójcik^a (Pr), M. Wojtyś^a (Dr), M. Szaj^a (Dr), K. Witkiewicz^a (Dr), B. Kubisa^a (Pr)

^a *Pomeranian Medical University, Szczecin, POLOGNE*

BACKGROUND

Pleural mesothelioma is not a common malignant neoplasm but its diagnosis and treatment are still unsatisfactory.

METHODS

The study enrolled 71 patients who were clinically suspected of having pleural mesothelioma due to the presence of pleural fluid and due to chest CT findings. Each patient underwent a pleural ultrasound to determine the amount of fluid in the pleura prior to videopleuroscopy. 20 ml of 1% lignocaine was anesthetized at the site of insertion of the videotracker into the pleural cavity. After insertion of the videopleuroscope and aspiration of pleural fluid, the parietal and visceral pleura were assessed macroscopically. Then forceps and a 1.9 mm cryoprobe were inserted through the 2 mm working channel of the videopleuroscope, which were placed near the lesions in the mural pleura and tissue material was collected. Subsequently, a 28 F drain was introduced through the hole to drain the pleural cavity. The following day, each patient underwent a chest radiograph to assess the presence of pneumothorax and lung expansion after pleural biopsy.

RESULTS

During histopathological evaluation of the tissue material, a diagnosis of pleural mesothelioma was directly confirmed in 11 of 71 patients, representing 15.5% of the total number of patients. In other patients, the histopathological diagnosis did not indicate pleural mesothelioma.

CONCLUSION

The use of cryobiopsy-assisted videopleuroscopy is a useful, promising and minimally invasive diagnostic option to obtain representative tissue material suitable for cytogenetic and immunohistochemical studies to confirm the diagnosis of pleural mesothelioma. However, assessment of its clinical usefulness requires further studies and an increase in the number of patients in whom it has been performed.

Disclosure of funding source(s): none

Abstract #8

Characteristics of bronchoalveolar lavage findings in Post-COVID-19 pneumonia patients with persistent interstitial lung disease: prospective analysis from a dedicated outpatient setting post-hospitalization

V. Clérigo^{*a} (Dr), L. Fernandes^a (Dr), A. Alfaiate^a (Dr), D. Noivo^a (Dr), P. Duarte^a (Dr)

^a Pulmonology Department, São Bernardo Hospital, Setúbal Hospital Center, Portugal, Setúbal, PORTUGAL

Background: Newly diagnosed persistent Post-COVID-19 interstitial lung disease (ILD) data remains largely understudied after hospital discharge in symptomatic patients. We aim to evaluate the characteristics of BAL findings in selected patients.

Methods: We performed a prospective observational study of 433 patients admitted to Pulmonology Post-COVID-19 Consultation (05/2020-04/2022). The diagnosis of newly persistent ILD was performed at least 6 months after acute infection, despite steroid treatment. Twenty-two (5.1%) patients were proposed to bronchofibroscopy (BF) with BAL (Pentax® EB-10 Scopes).

Results: BF pathologic findings were diagnosed in the majority of the patients (72.7%). Median age was 63.5 years (range: 41 to 78 years) and the majority was male (54.5%). Fatigue and dyspnoea were the most common complaints. Bronchial mucosal inflammation was present in the majority of cases (54.5%). BAL had a predominant cellular pattern in 6 cases (27.3%): lymphocytic (3; 13.6%) and neutrophilic (3; 13.6%). One case of lipid-laden alveolar macrophages was identified. BAL microbiological analysis revealed at least one pathogen in 3 cases (13.6%). There was no correlation between clinical symptoms, previous COVID-19 severity and BAL cellular pattern. Overall, BAL had an impact on medical decision-making in all cases: proposal to ILD Multidisciplinary Reunion to discuss ILD diagnosis (9; 40.9%); introduction of immunosuppression or antimicrobial therapy (4; 18.2%); surveillance/respiratory comorbid diagnosis (6; 27.2%); and clinical discharge (3; 13.6%).

Conclusion: Our real-life data results support the implementation of a Pulmonology Post-COVID-19 Consultation that includes use of BAL as a diagnostic complementary tool in selected patients. BAL had a nonegligible diagnostic yield and impact on medical decisions. A possible high rate of undiagnosed Post-COVID-19 ILD may be an explanation for the persistent symptomatic burden. This is one of the largest cohorts of COVID-19 pneumonia patients post-hospitalization in an outpatient setting submitted to BAL screening.

Disclosure of funding source(s): none

Abstract #9

Study on feasibility and utility of frozen section analysis of medical thoracoscopic pleural biopsies in undiagnosed exudative pleural effusion

S. Cladius^a (Dr), GS. Grace^a (Dr), N. Vennilavan^a (Dr), U. Bhattu^a (Dr), A. Ingle^a (Dr), V. Balasubramanian^a (Dr)

^a *Yashoda Hospitals, Hyderabad, INDE*

BACKGROUND:

Medical thoracoscopy for undiagnosed exudative pleural effusions allows both tissue diagnosis and pleurodesis to be achieved at same setting. Frozen section analysis of biopsy samples is routinely performed by pathologists in oncology domain. The aim of the study is to evaluate feasibility and accuracy of frozen section analysis of pleural biopsies taken during medical thoracoscopy and examine its utility in decision making for performing on table pleurodesis and / or indwelling pleural catheter.

METHODOLOGY:

Twenty consecutive patients with undiagnosed exudative pleural effusion after at least one diagnostic thoracentesis were recruited for this prospective study . Medical thoracoscopic pleural biopsies from all patients were subjected to frozen section analysis by pathologist.

RESULTS:

Frozen section of pleural biopsy was possible in all twenty thoracoscopic procedures intraoperatively with a mean reporting time of 12.12 minutes from the receipt of the specimen by the pathologist. Total number of pleural biopsies were limited to 3 samples following positive report. Frozen section at the time of thoracoscopy identified 7 cases as benign (35%) and 13 cases as malignant (65%). Amongst patient with malignancy on frozen section, talc pleurodesis was performed in 6 (46.1%) and indwelling pleural catheter was performed in 4 (30.7%) patients on table. The final diagnosis based on paraffin sections was malignant in eleven cases (55%) and benign in nine cases (45%). Both the sensitivity and specificity of frozen section in diagnosing benign pleural pathology was 100%. The sensitivity and specificity of frozen section in diagnosing malignant pleural pathology was 100% and 77.8% respectively.

CONCLUSION:

Frozen section of medical thoracoscopic pleural biopsy is feasible and has the good sensitivity and specificity for diagnosing benign pleural pathology. It aids in decreasing the procedural time, limit number of pleural biopsies and may facilitate decision making for on table pleurodesis and/or IPC.

Disclosure of funding source(s): none

Abstract #10

Conditional sensitivity and specificity of tuberculous pleurisy criteria by the inflammation status: a simulation study

H. Park^a (Dr), JH. Lee^a (Dr), CM. Choi^a (Pr), YJ. Jung^a (Pr), KW. Jo^a (Pr)

^a Asan medical center, Seoul, CORÉE, RÉPUBLIQUE DE

Background: The diagnostic performance of ADA and lymphocyte/neutrophil (L/N) ratio for tuberculous effusion could vary according to the conditional subgroup whose suspected diagnosis differs from the general population. However, no study was conducted in those subgroups to evaluate the diagnostic role of tuberculous effusion.

Methods: The thoracentesis conducted between 2009 and 2019 at Asan Medical Center was extracted by a data warehouse system. Two independent clinicians manually reviewed the etiology of pleural effusion. The sensitivity and specificity of ADA and L/N ratio criteria were evaluated by random sampling method to five quantile subgroups according to age and inflammatory lab (CRP, WBC, LD).

Results: Using 40IU/L of ADA and 0.75 of L/N ratio, the overall sensitivity and specificity were 77.7% and 93.1%. In the highest inflammatory subgroup (CRP, WBC), sensitivity lowered to around 60%, although the specificity was about 95%. (Figure 1) The highest LD group showed more than 70% of sensitivity according to ADA (40IU/L) and 0.75 L/N ratio criteria. In the age subgroup, the older age group did not show a lower trend of sensitivity. The youngest age group did not increase the sensitivity by over 80% by liberal criteria (ADA 30IU/L and L/N 0.75) due to the high proportion of low L/N ratios in false-negative cases.

Conclusion: Inflammatory status defined by WBC and CRP affects the sensitivity of ADA and L/N ratio criteria for tuberculous effusion. Clinicians should consider the false-negative cases of tuberculous effusion, especially in high-inflammatory cases, and readjust the cut-off level of ADA and age according to age and inflammatory levels.

Disclosure of funding source(s): none

Abstract #11

Clinical outcomes of bronchoscopic cryotherapy for central airway obstruction in adults: 11-year experience of single center

W. Ji^{*a} (Pr), JH. Jeong^b (Pr), H. Kim^c (Pr), HJ. Park^a (Pr), MA. Kim^d (Pr), CM. Choi^a (Pr)

^a Department of Pulmonary and Critical Care Medicine, Asan Medical Center, University of Ulsan College of Medicine, Seoul, South Korea, Seoul, CORÉE, RÉPUBLIQUE DE ; ^b Division of Pulmonology and Allergy, Department of Internal Medicine, Gyeongsang National University Hospital, Gyeongsang National University School of Medicine, Jinju, South Korea, Jinju, CORÉE, RÉPUBLIQUE DE ; ^c Division of Pulmonary, Allergy and Critical Care Medicine, Department of Internal Medicine, Hallym University Kangdong Sacred Heart Hospital, Seoul, Republic of Korea, Seoul, CORÉE, RÉPUBLIQUE DE ; ^d Division of Pulmonary, Department of Internal Medicine, Dongsan Hospital, Keimyung University College of Medicine, Daegu, Republic of Korea, Daegu, CORÉE, RÉPUBLIQUE DE

Background: Although bronchoscopic cryotherapy (BC) is a pragmatic modality for recanalization of central airway obstruction (CAO), the risk of bleeding complications is still the concerning point. This study aimed to present the clinical outcomes of BC and evaluate the factors associated with complication.

Methods: In this retrospective study, we reviewed the medical records of patients who underwent BC for CAO at Asan Medical Center, South Korea. Most sessions were conducted via flexible bronchoscopy under moderate sedation with local anesthesia. A multivariate logistic regression analysis was used to identify risk factors for complication.

Results: A BC was performed 262 sessions in 208 patients between January 2009 and December 2020. The most common cause of cryotherapy was recanalization of endobronchial tumor related CAO (233 of 262, 88.9%). More than partial reestablishment of airway patency were achieved in 212 out of 233 sessions (91.0%), symptoms relief after cryotherapy was found in 83 out of 110 sessions (75.5%), and a recurrence was reported in 72 of 233 sessions (30.9%). Most common complication was intrabronchial bleeding (78 of 233, 35.5%), but severe bleeding occurred only in 1 case (0.4%). One patient died of severe bleeding and respiratory failure after cryorecanalization. Univariate and multivariate logistic regression analysis revealed that diabetes mellitus (OR 2.466, 95% CI 1.136-5.353, $p=0.022$) and respiratory failure before BC (OR 3.046, 95% CI 1.015-9.139, $p=0.047$) were independently associated with moderate to severe complication, while histologic type of tumor was not related to bleeding. BC for CAO caused by blood clot or foreign body was successful in all cases, and there were no complications.

Conclusions: Bronchoscopic cryotherapy is an efficient and relatively safe interventional procedure for patients with CAO. Our finding suggested that diabetes and respiratory failure before cryotherapy might be a risk factor of moderate to severe bleeding complication.

Disclosure of funding source(s): none

Abstract #12

Development of artificial intelligence system classifying malignant and benign cells for rapid on-site cytologic evaluation (ROSE) samples of bronchoscopy

Y. Kagawa^a (Dr), K. Kirita^{*a} (Dr), M. Takahashi^b (Mlle), Y. Omi^c (M.), Y. Maekawa^c (Mlle), T. Sakai^a (Dr), Y. Shibata^a (Dr), H. Izumi^a (Dr), K. Nosaki^a (Dr), Y. Zenke^a (Dr), S. Matsumoto^a (Dr), K. Yoh^a (Dr), K. Goto^a (Dr)

^a Department of Thoracic Oncology, National Cancer Center Hospital East, Kashiwa, Chiba, JAPON ; ^b Department of Pathology and Clinical Laboratories, National Cancer Center Hospital East, Kashiwa, Chiba, JAPON ; ^c NEC Corporation, Tokyo, JAPON

Background: ROSE is not widely utilized in bronchoscopy due to limited human resources despite efficacy such as higher diagnostic yield and reduced number of punctures. Accurate artificial intelligence-assisted diagnosis system could resolve this clinical issue.

Methods: We retrospectively collected in-house whole slide imaging (WSI) from 26 independent Diff-Quik stained slides made during bronchoscopy in our hospital and selected 741 cells from the 26 WSI for training. Training data were labeled for 9 classes (4 types of malignant cells and 5 types of benign cells) by discussion of 2 ROSE specialists. To avoid over-fitting to the image characteristics of the data, we applied data augmentation by color transformation, rotation, and random mirroring to have 1000 images per class. We investigated the classification performance by 3 baseline models such as 2-class, 5-class, and 9-class, and the ensemble method that combines the predictions from the 3 models. Next, we compared the trained AI's performance for microscope imaging with or without applying image normalization method which reduces the difference in image characteristics between WSI and microscope imaging. To evaluate specificity with sufficient sensitivity to avoid false positive in ROSE, specificity at sensitivity 0.90 (spe0.90) was assessed.

Results: Sensitivity and specificity by a conventional 2-class classification in WSI dataset were 0.896/0.845. Spe0.90 of each method (2/5/9/ensemble) were 0.83/0.88/0.88/0.90, respectively. For microscope imaging, the AI model using the ensemble method without the normalization method only showed a spe0.90 of 0.76, while that with normalization method achieved a spe0.90 of 0.90 which is comparable with that of WSI.

Conclusion: The developed AI system showed sufficient sensitivity and specificity for microscopic imaging. We are going to validate the diagnostic yield of this AI system using a larger clinical dataset from multiple institutes.

Disclosure of funding source(s):

This research is funded by NEC corporation

Abstract #13

Correlation of activation time and number of passes to diagnostic yield of endobronchial ultrasound guided transbronchial nodal cryobiopsy: an initial experience

SS. Kho^{*a} (Dr), CS. Chai^a (Dr), NH. Ngu^a (Dr), MC. Yong^a (Dr), SK. Chan^a (Dr), ST. Tie^a (Dr)

^a Division of Respiratory Medicine, Sarawak General Hospital, Kuching, Sarawak, MALAISIE

Background The role of EBUS/TBNA beyond lung cancer staging is frequently limited, especially in the diagnosis of rare and benign mediastinal lesion. EBUS guided transbronchial nodal cryobiopsy (TBNC) is a novel technique in acquiring histological specimen from mediastinal lesions. Although feasibility of EBUS/TBNC had been proven in study, further technical refinement is needed to further develop this technique. We aim to assess the correlation of cryo-activation time and number of passes to the diagnostic yield of EBUS/TBNC.

Methods Retrospective review of 25 EBUS/TBNC cases performed over 10 months duration. EBUS/TBNC procedure was performed with 1.1 mm cryoprobe without rapid onsite examination.

Results The median age of our cohort was 60.0 (IQR 55.5-67.5) years old. Majority (92%) of cases were performed for diagnostic indication. Artificial airway was used in all cases (endotracheal tube 12%, rigid bronchoscope 20%, laryngeal mask airway 68%) with median procedure duration of 75 (IQR 60-90) minutes. EBUS/TBNA was performed with 22G TBNA needle in all cases prior cryoprobe insertion. 15 (60%) patients required additional incision with electrosurgery knife to facilitate cryoprobe insertion. Median 4 (IQR 3-4) passes were performed for EBUS/TBNC and was activated for a median of 10 (IQR 8-11) seconds. Overall, EBUS/TBNC recorded significantly higher diagnostic yield than EBUS/TBNA (80% vs. 52%, $p<0.05$) with majority comprised of malignant diseases. No major complications were encountered in all cases. Median aggregate specimen size was 7 (IQR 5-8) mm with no significant correlation with overall diagnostic yield. Longer freezing time ($r_s=0.420$, $p<0.05$) and number of cryobiopsy passes ($r_s=0.442$, $p<0.05$) was found to have strong positive correlation to higher overall diagnostic yield.

Conclusion EBUS/TBNC had better diagnostic yield than EBUS/TBNA by providing histological evidence of disease. Larger study focusing on technical refinement is highly anticipated in the future.

Disclosure of funding source(s): none

Abstract #14

Recanalization of post tuberculosis tracheobronchial stenosis assisted by virtual bronchoscopic navigation

SS. Kho^{*a} (Dr), MZ. Nasaruddin^a (Dr), JL. Wan^a (Dr), MF. Abu Saman^a (Dr), JA. Abdul Rahaman^a (Dr)

^a Department of Pulmonology, Serdang Hospital, Selangor, MALAISIE

Background Airway involvement in post-tuberculosis tracheobronchial stenosis (PTTS) is frequently complex in nature with multi-level involvement. Airway recanalization attempt is extremely challenging in patients who present late with chronic total occlusion (CTO) of the main bronchi with no visible ostium. Frequently, such patients will be managed conservatively if surgical reconstruction is deemed unsuitable.

Case Report An 18-year-old lady with a history of pulmonary tuberculosis presented with recurrent pneumonia. Flexible bronchoscopy noted distorted trachea with multi-level tracheobronchial stenosis with no visualisation of RMB ostium. Primary surgical repair was deemed high risk in view of the complexity of stenosis. Under rigid bronchoscopy, the RMB ostium was first postulated by observing the pattern of mucosal indentation and puckering but was proven inaccurate after verification by virtual bronchoscopic navigation (VBN). After establishing a safety margin using convex probe endobronchial ultrasound at the proposed RMB ostium, the area of interest was then punctured with a 20G transbronchial aspiration needle (TBNA) followed by passing of guidewire under fluoroscopic guidance. The puncture was successful after purulent secretion was seen flowing through the TBNA needle as well as swift advancement of guidewire into the right endobronchial tree. Mucosal incision was then performed with electrocautery knife in a radial manner. The incised ostium was then gradually dilated from 4 to 8mm employing the controlled radial expansion (CRE) balloon. The *neo*-RMB ostium was then treated with topical mitomycin C after bronchoscopic examination confirmed normal distal airway. Procedure was uncomplicated and RMB remain patent on fourth month of surveillance bronchoscopy with significant improvement of total lung capacity from 2.36 to 3.63 liter.

Conclusion This case highlights the importance of diligent pre-procedural planning coupled with a combination of various interventional pulmonology techniques to provide a safe and novel approach to this complex and challenging, century-old problem.

Disclosure of funding source(s): none

Abstract #15

Bronchial occlusion with Endobronchial Watanabe Spigot assisted by bidirectional guiding device under laryngeal mask airway ventilation

SS. Kho^{*a} (Dr), RL. Ho^a (Dr), MC. Yong^a (Dr), ST. Tie^a (Dr)

^a Division of Respiratory Medicine, Sarawak General Hospital, Kuching, Sarawak, MALAISIE

Background Bronchial occlusion with *Endobronchial Watanabe Spigot* (EWS) is a useful technique in the management of persistent air leak (PAL). However, its insertion usually requires endotracheal intubation which maybe challenging in patient with poor respiratory reserve. In this report, we describe a case of successful EWS placement assisted by bidirectional guiding device (*CC-6DR-1, Olympus, Japan*) with the usage of supraglottic airway (*laryngeal mask airway, LMA*).

Case Report 64 years old lady with refractory and relapsed multiple myeloma on thalidomide and dexamethasone presented to us with necrotizing pneumonia and pyopneumothorax. Frank pus was drained after intercostal chest tube (ICT) insertion. However, despite two weeks of adequate intravenous antimicrobial therapy, right lung remains non-expandable with persistent air leak (*Cerfolio Grade 4*). CT thorax confirmed right lung necrotizing pneumonia and pyopneumothorax without obvious bronchopleural fistula. Bronchial occlusion was decided as patient was deemed high surgical and anesthetic risk in view of underlying advanced life-limiting co-morbidities. Under LMA ventilation (*with i.v. midazolam and fentanyl*), balloon occlusion test was performed sequentially on segmental airway of right endobronchial tree. Air leak reduced significantly to *Cerfolio Grade 1* upon occlusion of anterior segment of right upper lobe (RB³). Bidirectional guiding device was then inserted through the bronchoscope's working channel with a 6mm EWS plugged at its tip. Through the LMA and cautiously through the vocal cord, the EWS was manipulated and snugged into RB³ tightly. Post procedure, air leak ceased completely and lung expansion improved. ICT was off the following day and patient discharged home with prolonged course of oral antimicrobial. Patient remained well but succumbed to her underlying hematological malignancy two months later peacefully.

Conclusion Bronchial occlusion with EWS is a valid option for high surgical risk patient with PAL. Further studies focusing on less invasive insertion technique is highly anticipated in the future.

Disclosure of funding source(s): none

Abstract #16

Middle aged female with pleural effusion - A Double Whammy

D. Bhatkar^a (Dr), N. Vennilavan^a (Dr), GS. Grace^a (Dr), U. Bhattu^a (Dr), A. Ingle^a (Dr), V. Balasubramanian^{*a} (Dr)

^a *Yashoda Hospitals, Hyderabad, INDE*

Background:

Lupus pleuritis can occur as the initial clinical presentation and is reported only in 2-3% of patients with SLE. Though patients with SLE can develop tubercular pleural effusion due to underlying immunosuppression induced by the disease or drugs used in treatment, coexistent lupus nephritis with tubercular pleural effusion is extremely uncommon.

Case Report:

A 40 year old female with coexistent hypertension and hypothyroidism was treated as seronegative rheumatoid arthritis for 1 year with steroids and methotrexate at an outside hospital. On presentation patient reported low grade fever, loss of weight and appetite for 15 days. On physical examination, gangrene of right toe and anasarca was observed. CT Chest was suggestive of left sided pleural effusion with subcarinal lymphadenopathy. Serology tested positive for ANA and Anti-ds DNA confirming the diagnosis of SLE. Urine analysis revealed proteinuria: 3+ and pleural fluid cytology showed LE cells and analysis was suggestive of haemorrhagic exudative lymphocytic effusion with low ADA confirming lupus pleuritis. Since effusion was unilateral and rheumatologist was keen to initiate the patient on pulse steroid and immunomodulators, a decision for thoracoscopic biopsy was made to rule out secondary infection. Thoracoscopy was suggestive of inflamed pleura and biopsy revealed granulomatous inflammation with stain for AFB positive, confirming a diagnosis of coexistent lupus pleuritis and tubercular pleural effusion. Patient was initiated on standard ATT and oral steroids and following 2 weeks of treatment with ATT, pulse steroids and rituximab was initiated. At 6 month followup patient had significant resolution of effusion and remission of SLE was achieved.

Conclusion:

To the best of our knowledge, this is the first case report of pathology proven ipsilateral coexistent lupus pleuritis with tubercular effusion. Prompt identification and management of coexistent tuberculosis is important to avoid dissemination of tuberculosis on the background of immunosuppression to mitigate morbidity.

Disclosure of funding source(s): none

Abstract #19

Predictors of successful pleurodesis after indwelling pleural catheter (IPC) insertions and its complications in patients with malignant pleural effusion

A. Navasakulpong^a (Dr), P. Wattanasit^b (Dr)

^a Prince of Songkla university, Hatyai, THAILANDE ; ^b Prince of Songkla university, Hat Yai, THAILANDE

Introduction: Indwelling pleural catheter is now recommended as a treatment option for patients with symptomatic pleural effusion. IPC related complications were considered low rate and manageable. Successful pleurodesis after IPC insertion were also consistently reported. However, data regarding IPC outcomes in developing country where less cancer treatment could be accessible is still limited.

Methods: A single-center observational study was done. Data collection regarding IPC related outcomes in patients with symptomatic malignant pleural effusion, predictors of successful pleurodesis leading to IPC removal and prognostic factors for IPC related complications were evaluated using a multistate model analysis.

Results: A total of 89 patients with symptomatic malignant pleural effusion underwent IPC insertion during 2004 through 2021. Most of the patients had lung cancer (67.4%), followed by breast cancer and gynecologic malignancy (11.2% and 9.0%, respectively). Successful pleurodesis lead to IPC removal rate was 25.8%. Median time to IPC removal was 133 days. Expandable lung, talc via IPC on insertion day, and chemical pleurodesis via IPC were associated with high probability of IPC removal. Pleural infections rate was 13.6% with one case of empyema thoracis. Median time to complications was 5 weeks. Protective factor for IPC related complication was expandable lung.

Conclusion: IPC is a safe therapeutic option in patients with symptomatic malignant pleural effusion and can lead to successful pleurodesis. Expandable lung, talc via IPC on insertion day, and chemical pleurodesis via IPC were associated with higher probability of successful IPC removal. Trapped lung was a predictor of IPC related complication.

Disclosure of funding source(s): none

Abstract #20

Spontaneous gastropleural fistula - a cause of high amylase effusion

R. Dua^{*a} (Dr), N. Baishya^a (Dr), A. Kp^a (Dr), R. Singh^b (Dr), I. Patnaik^b (Dr)

^a AIIMS —————, Rishikesh, INDE ; ^b aiims, Rishikesh, INDE

Background

Spontaneous Gastro pleural fistula as a cause of high amylase effusion secondary to perforated gastric ulcer is a rare entity.

Case Report

A 35-year chronic alcoholic male, presented with intermittent and radiating epigastric pain for 2 years. Over last 15 days he complained of sudden onset left-sided chest pain and progressive breathlessness. A chest X-ray showed left-sided hydropneumothorax following which intercostal drainage was inserted. Pleural fluid analysis revealed exudative, neutrophilic effusion with high amylase levels (749 IU/ml) while serum amylase and lipase were within normal range. CECT abdomen and thorax followed by MRCP was performed for pancreatitis which was normal.

Oral contrast study was then performed to look for esophageal perforation which revealed no abnormality. In view of persistently elevated pleural fluid amylase levels and high volume drain (>1 litre daily with debris), an upper gastrointestinal endoscopy was then performed which showed a large clean base ulcer (8cmx6cm) with a fistulous opening. A 1cm guide wire could be negotiated across ulcer base to the thoracic cavity.

A NJ tube was inserted, fistulous communication was clipped via upper Gastrointestinal endoscopy. Patient has been planned for surgical repair once the general condition improves.

Discussion

GPF have been uncommonly encountered usually post surgeries (gastric bypass, pulmonary resection, splenectomy)¹⁻³, post trauma, malignancies (gastric lymphoma, Ewing's sarcoma), as complication of concomitant chemo-radiotherapy⁴ and rarely following bevacizumab chemotherapy⁵. Perforated gastric ulcer is a rare cause of GPF. In this case neither CT evaluation nor oral contrast oesophagogram could demonstrate the cause of high volume ICD drain. Direct visualisation by endoscopy proved to be clinching.

Conclusion

Recognising GPF as a rare complication of perforated gastric ulcer is necessary to avoid both delayed diagnosis and unwarranted morbidity / mortality. Direct visualisation by endoscopy should be done in setting of unexplained high amylase, high output intercostal drains.

Disclosure of funding source(s): none

Abstract #21

Routine interventional pulmonology and surgical procedures in the treatment of benign tracheal stenosis

M. Rusakov^a (Pr), V. Parshin^a (Pr), M. Simonova*^a (Dr)

^a Sechenov University Hospital, Moscow, RUSSIE, FÉDÉRATION DE

Background: benign tracheal stenosis is a rare but extremely serious condition that significantly impairs patient's quality of life and can potentially be fatal. The problem of postintubation and posttracheostomy tracheal stenoses remains relevant due to the spread of COVID-19.

Methods: tracheal resection is the main treatment method of benign tracheal stenosis. In most cases, patient is prepared for this surgical procedure by interventional pulmonology methods. Some patients cannot be treated surgically immediately due to the severity of their general condition or if the stenosis is long or complex. In this case we perform stenting or T-tube tracheal reconstruction. After that tracheal resection is performed, if possible.

We perform dilatation of stenosis using rigid bronchoscopy or balloon dilatation gradually increasing the diameter of bronchoscope or dilatator by 1 mm under total intravenous anesthesia. Dumon silicone stents and self-made endotracheal tube stents are used for long-term dilatation of stenosis.

Results: 1279 patients who underwent 3705 procedures from 2001 to 2021 were recruited. 2059 endoscopic (854 stenosis dilatations, 454 stentings, 362 stent removals, 349 granulation resections, 40 stent repositions), and 1646 surgical (436 tracheal resections, 1210 T-tube tracheal reconstructions) interventions were performed. 291 (22.76%) patients underwent surgical treatment. 196 (15.32%) patients were treated by means of endoscopic interventions. 792 (61.92%) patients underwent combined endoscopic and surgical treatment. 921 (72.01%) patients successfully completed treatment. 9 (0.7%) patients remain long-term tracheotomized (tracheostomy tube or T-tube). 126 (9.85%) patients undergo treatment at present. Hospital mortality was 0.94 % of the total number of patients.

Conclusion: The classical combination of interventional pulmonology and surgery for the treatment of benign tracheal stenosis demonstrates minimal mortality rate and high efficiency. The successful use of these methods allows to treat patients not only with complex stenoses but also those with extremely poor status, especially after prolonged ventilation for COVID-19.

Disclosure of funding source(s): none

Abstract #22

Flexible Bronchoscopy and Pulmonary Biopsy Forceps in Tracheobronchial Headscarf Pins Removal

M. Elhidsi^a (Dr), W. Aniwidyaningsih^a (Dr), P. Prasenohadi^a (Dr), MF. Alatas^a (Dr), GA. Desianti^a (Dr), D. Soehardiman^a (Dr)

^a perbronki, Jakarta, INDONÉSIE

Introduction:

Headscarf pin is unusual type of aspirated foreign bodies in women wearing headscarves. The aim of this study was to evaluate the efficacy and safety of flexible bronchoscope using pulmonary biopsy forceps for removal of aspirated headscarf pins.

Methods:

This was a retrospective study performed in Indonesian national referral for respiratory diseases, Persahabatan Hospital, in January 2013 to December 2021. Diagnosis of headscarf pin aspiration was confirmed by typical history and chest x-ray. Flexible bronchoscopy was performed under general anesthesia on day of admission. The bronchoscope was passed through the laryngeal mask airway. Pins were removed using a pulmonary biopsy forceps. Clinical characteristics, time of procedure, Conversion rate to surgery and complications were recorded.

Results:

Twenty female patients with headscarf pin aspiration were managed by flexible bronchoscopy. The age ranged from 11 to 46 years with a median of 14. The time interval between aspiration and admission was less than 24 hours in 5 patients (25%). All patients had cough and hemoptysis occurred one patient. The pin was located in the trachea in 7 cases (35%), the right basal bronchus in 5 cases (25%) and left main bronchus in 4 cases (20%). All aspirated pins were found with the pearl head down and the sharp tip impacted in the mucosa. Median time of procedure was 4 minute 35 second. No case was converted to surgery. No major complication occurred.

Conclusion:

flexible bronchoscope using pulmonary biopsy forceps was effective and safe in Tracheobronchial Headscarf Pins Removal

Keywords:

Headscarf pin, flexible bronchoscopy, pulmonary biopsy forceps

Disclosure of funding source(s): none

Abstract #23

Comparison of modified T-piece resuscitators and nasal cannula oxygen for infantile fiberoptic bronchoscopy: a prospective randomized controlled study

N. Junjie^{*a} (Dr)

^a First People's Hospital of Zigong City, Sichuan Province, Zigong 643000, China, Zigong, CHINE

Objective To optimize the oxygen therapy regimen for infants with pulmonary disease undergoing bronchoscopy. **Methods** A total of 42 children were divided into nasal cannula oxygen (NC) group and modified T-piece resuscitator (TPR) group. TPR group: The TPR was connected to the air-oxygen mixer for respiratory support, and the oxygen concentration was set to 29%; the initial flow rates were: 5L/min, 6L/min, and the corresponding weight ranges were: 4-8 kg, 8-10kg; set PEEP to 5cmH₂O; PIP to 20cmH₂O. NC group: 2L/min of oxygen. The results of blood oxygen saturation in the two groups were recorded as the main index (judgment criteria: SpO₂<90% was hypoxemia, of which 85%≤SpO₂<90% was mild hypoxia, and 80%≤SpO₂<85% was moderate hypoxia, SpO₂<80% was severe hypoxia), and the heart rate and breathing rate during the operation were recorded as secondary indicators (judgment criteria: bradycardia <P5, tachycardia >P95, bradypnea <P5, apnea> 20s or shortness of breath > P95). **Results** 1. Each group was assigned 21 patients, and the baseline characteristics were not statistically significant; 2. The incidence of hypoxemia in the TPR group was significantly lower than that in the NC group ($\chi^2=6.46$, $P=0.011$); the incidence of mild hypoxemia in TPR group was higher than that in NC group, but the incidence of severe hypoxemia in infants was significantly lower than that in NC group ($Z=2.52$, $P=0.012$); 3. The incidence of intraoperative arrhythmia and respiratory rhythm abnormality in the NC group was significantly higher than that in the TPR group ($\chi^2=2.74$ and 8.40 , $P<0.05$). **Conclusion** The modified TPR can significantly reduce the incidence of hypoxia in infants with lung diseases receiving FB. The risk of oxygenemia; compared with traditional nasal cannula oxygen, TPR can significantly improve the severity of hypoxemia, and reduce the incidence of arrhythmia and respiratory rhythm abnormalities.

Disclosure of funding source(s): none

Abstract #24

EBUS-GS-TBLC increase the diagnosis rate in different type of peripheral pulmonary lesions

W. Zhao^a (Mme), Z. Zhu^b (Mlle), J. He^c (M.), Y. Cao^d (M.), N. Wang^d (Mme), X. Xie^d (Mme), G. Wei^d (Mme), H. Lin^d (Mme), Y. Chen^d (Mme), S. Sun^d (M.), Z. Meng^d (M.), W. Chen^{*b} (Dr)

^a Department of Pathology, the Affiliated Nanjing Hospital of Nanjing Medical University, Nanjing, CHINE ; ^b Department of Respiratory and Critical Care Medicine, The Huaian Clinical College of Xuzhou Medical University, Huai'an, CHINE ;

^c Research Center for the prevention and treatment of drug resistant microbial infecting, Youjiang Medical University for Nationalities, Baise, CHINE ; ^d Department of Respiratory and Critical Care Medicine, The Affiliated Huaian No.1 People's Hospital of Nanjing Medical University, Huai'an, CHINE

Background and objective: Recently, endobronchial ultrasonography with guide sheath-guided (EBUS-GS) has been increasingly used in the diagnosis of peripheral pulmonary lesions (PPLs) from human natural orifice. However, the diagnostic rate is still largely dependent on the location of the lesion and the probe. Here, we reported a new procedure to improve the diagnostic rate of EBUS-GS-transbronchial lung biopsy/cryobiopsy (TBLB/TBLC). In addition, we performed TBLC under general anesthesia with laryngeal mask airway (LMA) in all of the patients who were treated with this method. **Methods:** Retrospective review of 156 cases of EBUS-GS-TBLB/TBLC for PPLs over 11 months.

Results: The study evaluate the diagnosis of PPLs with blind-ending type and pass-through type procedures (Type I and Type II) of EBUS-GS-TBLB/TBLC. A total of 156 cases EBUS-GS-TBLB/TBLC were performed during the study period. Among them, 61 (39.1%) were performed Type I and 95 (60.9%) were performed Type II. Clinical baseline characteristics did not differ between two groups. The overall diagnosis rate of 156 patients with EBUS-GS-TBLB/TBLC was 81.4% (127/156), and different method type have significant influence on the diagnostic yield ($P = 0.016$, $\chi^2 = 5.699$). Among them, diagnostic yields for Type I with eccentric ($n=40$), Type I with concentric ($n=21$), Type II with eccentric ($n=48$), and Type II with concentric ($n=47$) were 65.0%, 85.7%, 87.5% and 87.2%, respectively ($P < 0.05$). The incidence of complications in 156 patients was 2.6%.

Conclusion: EBUS-GS-TBLB/TBLC is a safe and highly diagnostic technique, different method types have significant influence on the diagnostic yield. Moreover, type II procedure has higher diagnostic yield. In addition, Type I with eccentric had the lowest diagnosis yield.

Disclosure of funding source(s):

Huai'an Natural Science Research Project (HAB 201928) and Huai'an Key Laboratory of Immunology (HAP2020)

Abstract #25

Efficacy and mechanism of submucosal local injection of triamcinolone acetonide in the treatment of Tracheobronchial stenosis due to tuberculosis

Y. Xiao*^a (Dr)

^a Hunan Chest Hospital, Changsha, CHINE

Objective To evaluate the clinical efficacy and mechanism of submucosal local injection of triamcinolone acetonide in the treatment of tracheobronchial stenosis due to tuberculosis. **Methods** 1. A total of 110 eligible patients with tracheobronchial tuberculosis (TBTB, stenosis $\geq 50\%$) in our hospital from January 2019 to December 2021 were included in this study. In the observation group, 58 patients were treated by conventional interventional therapy combined with local injection of TA, and 52 patients received conventional interventional therapy alone in the control group. The clinical efficacy was statistically compared between two groups. 2. Use immunohistochemistry to compare the expression of IL-8 and bFGF in airway mucosa tissue. Human primary tracheal fibroblasts were co-incubated with different concentrations of TA, Ag85B was used to stimulate cell secretion, Western blot and real-time quantitative reverse transcription polymerase chain reaction (RT-qPCR) were used to detect IL-8, bFGF protein expression levels and mRNA relative expression levels. **Results:** The effective diameter after dilation in observation group was higher than in control group. The 6-month re-stenosis rate was lower than control group, The complete effective rate of treatment was higher than control group. 2. Western blot and RT-qPCR detection: The positive expression levels of IL-8 and bFGF were in the Ag85B group > the blank group, while the Ag85B+TA group < Ag85B group. **CONCLUSION:** Submucosal local injection of triamcinolone acetonide combined with conventional interventional therapy may reduce airway inflammation and fibrosis by down-regulating the expression of IL-8 and bFGF, thereby inhibiting the re-stenosis of TSTB after dilation, be safe and effective.

Disclosure of funding source(s):

Fund program : Clinical Medical Technology Innovation Guidance Project of Hunan Province(2020SK50701); Natural Science Foundation of Changsha City(kq2014187)

Abstract #26

Triamcinolone acetonide induces the autophagy of fibroblasts in tracheobronchial stenosis due to tuberculosis via mediation of SIRT1/FOXO3 pathway

L. Li^a (Dr), Y. Xiao^{*a} (Dr)

^a Hunan Chest Hospital, Changsha, CHINE

Background: Tracheobronchial stenosis due to tuberculosis (TSTB) seriously threatens the health of patients with tuberculosis. In addition, the inflammation and autophagy of fibroblasts could lead to the progression of TSTB. It has been reported that triamcinolone acetonide (TA) could inhibit the autophagy of fibroblasts. Nevertheless, the mechanism underlying the impact of TA on TSTB remains not explored.

Methods: In order to mimic TSTB *in vitro*, WI-38 cells were exposed to Ag85B. In addition, CCK8 assay was applied to assess the function of TA in WI-38 cells. RT-qPCR was applied to detect the mRNA level of SIRT1 and FOX3a, and autophagy-related proteins were evaluated by western blot. VEGF level was investigated by IHC staining. ELISA was applied to detect the secretion of inflammatory cytokines. Furthermore, H&E staining was applied to observe the injury of tissues.

Results: Ag85B limitedly affected the WI-38 cell viability, while TA notably suppressed Ag85B-treated WI-38 cell viability. TA dose-dependently induced the apoptosis of Ag85B-treated WI-38 cells. In addition, Ag85B-induced upregulation of IL-6, TNF- α , IFN- γ and fibrotic proteins (TGF- β and VEGF) was significantly abolished in the presence of TA. Meanwhile, TA reversed Ag85-induced inhibition of cell autophagy via mediation of p62, LC3 and Beclin1. Furthermore, silencing of SIRT1/FOXO3a pathway could reverse the effect of TA on autophagy of Ag85B-treated cells.

Conclusion: TA significantly induced the autophagy of fibroblasts in TSTB via mediation of SIRT1/FOXO3 pathway. Thus, TA might act as a novel agent against TSTB.

Disclosure of funding source(s):

Fund program : Clinical Medical Technology Innovation Guidance Project of Hunan Province(2020SK50701);Natural Science Foundation of Changsha City(kq2014187)

Abstract #27

The glycemic lever in endobronchial tuberculosis patients with type 2 diabetes affects the severity and treatment outcomes of TB disease

L. Luo^a (Dr)

^a Hunan Chest Hospital, Changsha, CHINE

Objective To illustrate whether glycemic level in endobronchial tuberculosis patients with type 2 diabetes affects the severity and treatment outcomes of TB disease. **Methods** A total of 157 EBTB patients with T2D were included in this study. 50 of them whose blood glucose in well control (HbA1C \leq 7.0%) were group A, the other 107 patients whose blood glucose in poor control (HbA1C $>$ 7.0%) were group B. We compared the number of subtypes of EBTB, rate of active EBTE, positive rate of sputum smear of those 2 groups before treatment. All patients received routine anti-tuberculosis chemotherapy and glucose-lowering medication. Active EBTE patients received bronchoscopic treatment meanwhile. After 1-month, there were 41 patients whose blood glucose in well control (fasting plasma glucose $<$ 7mmol/L & 2 hours postprandial blood sugar $<$ 11.1mmol/L) in group B were classified as group B1, and the other 66 whose blood glucose in poor control were group B2. We compared the recovery time and sputum smear conversion rates of those 3 groups. **Results** In group A, the rate of active EBTE, positive rate of sputum smear are lower than group B, those differences have statistic significant ($\chi^2=10.448$, $p=0.001$. $\chi^2=13.443$, $p<0.001$). In group A, the recovery time of active EBTB is faster than group B1 and group B2. The time of sputum smear conversion in group A and group B1 is faster than group B2, and those differences have statistic significant. **Conclusion** The patient whose blood glucose in well control has lower active EBTB and positive sputum smear rates before treatment. The patient whose blood glucose in well control has faster recovery time of EBTB, and the time of sputum smear conversion is also faster than patients whose blood glucose in poor control.

Disclosure of funding source(s):

Research Project of Health and Family Planning Commission of Hunan Province(202203084170)

Abstract #28

Feasibility of a novel diagnostic technique for persistent air leak by endobronchial CO₂ insufflation

V. Ruiz^{*a} (Dr), I. Carboni Bisso^a (Dr), F. Rosciani^a (Dr), M. Las Heras^a (Dr)

^a Hospital Italiano de Buenos Aires, Buenos Aires City, ARGENTINE

Background: Persistent air leaks (PAL) and bronchopleural fistula (BPF) are seen after lung surgeries. Chest computed tomography has been described to be performed for identification of BPF. However, this method does not allow measuring its magnitude nor performing therapeutic interventions. A diagnostic tool could be endobronchial carbon dioxide (CO₂) insufflation with concomitant monitoring of pleural gasses by capnography at pleural drainage tubes.

Case report: A 64-years-old woman, with pulmonary fibrosis, presented pneumothorax during unilateral lung transplantation. Due to anastomotic leakage suspicion, direct CO₂ insufflation was applied to bronchial stump suture. An increase in the capnography curve was observed. Medical treatment was performed and the procedure was repeated after 10 days, confirming its resolution. The second case, a 44-years-old woman, with previous uterine myomatosis, presented septic shock during hysterectomy post-operative care. She developed severe acute respiratory distress syndrome requiring veno-venous extracorporeal membrane oxygenation. She presented unilateral pneumothorax, so a bronchoscopy was performed: a positive CO₂ curve and an increase in capnography were observed into the apicoposterior (B2-B2) and anterior (B3) segments. Given the location and the critical condition of the patient, conservative treatment was taken.

Conclusion: An endobronchial CO₂ insufflation technique with direct bronchoscopic visualization is presented as a feasible alternative to previously reported methods, though further studies are required to determine safety settings.

Bibliography

1. [Kurman JS. Persistent air leak management in critically ill patients. Journal of Thoracic Disease 2021; 13: 5223-5231.](#)
2. [Mark JB, McDougall IR. Diagnosis and localization of bronchopulmonary air leaks using ventilation scintigraphy. Chest 1997; 111: 286-289.](#)
3. [Ratliff JL, Hill JD, Tucker H, et al. Endobronchial control of bronchopleural fistulae. Chest 1977; 71: 98-99.](#)
4. [Bharat A, Graf N, Cassidy E, et al. Pleural Gas Analysis for Detection of Alveolopleural Fistulae. Ann Thorac Surg 2015; 99: 2179-2182.](#)

Disclosure of funding source(s): none

Abstract #30

Case Report: Three Cases of Tracheobronchial Mucormycosis with Satisfactory Prognosis

J. Long^a (Dr), Y. Liu^{*a} (Dr), L. Liu^a (Dr), Y. Xiao^a (Pr), Y. Zhang^a (Dr), Y. Li^a (Dr), Y. Zhou^a (Dr), S. Ouyang^a (Dr)

^a First Department of Respiratory Medicine, Yan'An Hospital Affiliated to Kunming Medical University, Kunming, Yunnan, China, Kunming, Yunnan, China, CHINE

Abstract: Tracheobronchial mucormycosis is a rare form of pulmonary mucormycosis with the involvement of the central airways. It is relatively rare in clinical practice, but due to the difficulty of early diagnosis and the complicated treatment process, causing a high mortality rate and poor prognosis. Our department has recently admitted three patients with tracheobronchial mucormycosis, in the process of diagnosis and treatment, the bronchoscope has been fully utilized, and finally the condition of these three patients has been well improved. Bronchoscopy biopsy is less traumatic and reproducible. At the same time, it can be used to collect the alveolar lavage fluid or other materials as samples, and submit for inspection to enhance the positive rate, which is very useful for early diagnosis. And for confirmed patients, besides antifungal treatment, controlling the underlying diseases, and surgical treatment when it is necessary, bronchoscopy is more useful, it can not only be used to evaluate the current condition and treatment effect, but also greatly promote the recovery of the disease by clearing those intrabronchial lesions and dripping amphotericin B into the bronchus intermittently, and which will help to greatly improve the patient's condition and prognosis.

Keywords: pulmonary mucormycosis, Tracheobronchial mucormycosis, diagnosis and treatment via bronchoscopy, early diagnosis, effective treatment

Disclosure of funding source(s): none

Abstract #31

EBUS - unusual site & unusual use for EBNA

R. Dua^{*a} (Dr), A. Negi^a (Dr), P. Sivaramakrishnan^a (Dr), A. Layek^a (Dr)

^a *aiims, Rishikesh, INDE*

Background

EBUS is usually used to sample benign / malignant mediastinal or peribronchial lesions. We have used it in paravertebral mass lesion and in patients of main stem bronchus occlusion with vascular growths (EBUS-EBNA) where EBLB is risky or leads to bleeding and cEBNA leads to insufficient material for IHC /molecular analysis. Both patients were unwilling/unfit for rigid bronchoscopy procedures under GA

Case 1

A 50 year female presented with main bronchus growth which was highly vascular. EBLB with FOB could not be done, cEBNA failed to get adequate sample on cell block though cytology showed NSCLC .EBUS was then used to sample the lesion using 22 G needle without any significant bleeding and adequate cell block was obtained for further analysis.

Case 2

A 63 year male presented with SVC syndrome and vascular RMB mass. cEBNA was done(4 passes, with ROSE).In view of mild bleeding EBLB was attempted which led to increased bleeding and withholding of further sampling. cEBNA cell block proved inadequate for molecular/IHC analysis. EBUS was done using 22G needle both from mass & LN and cell blocks prepared from both along with ROSE, thus confirming diagnosis & enabling further analysis.

Case 3

A 60 year male presented with back pain for several months. PET-CT revealed high uptake growth encircling trachea posteriorly. Interventional radiology opinion was taken for transthoracic sampling which was refused. Then patient was taken up for EBUS screening and growth sampled which turned out to be NSCLC. Patient was lost to follow up and no further IHC/molecular analysis was performed.

Conclusion

Rarely when EBLB is risky and cEBNA fails to yield sample for cell block, EBUS-EBNA can be used to get adequate sample. EBUS can be an additional tool for paravertebral masses if transthoracic approach is not possible.

Disclosure of funding source(s): none

Abstract #32

Tubular silicone stent removal via tracheostomy stoma: when rigid bronchoscopy is not an option!

I. Matus^a (Dr), V. Krishna Matta^b (Dr)

^a Thoracic Surgery and Interventional Pulmonology Service, Helen F. Graham Cancer Center and Research Institute, Christiana Care, Newark, De, ÉTATS-UNIS ; ^b Department of Medicine, Christiana Care, Newark, De, ÉTATS-UNIS

Background: Silicone stent removal involves rigid bronchoscopy and use of rigid forceps. Inability to intubate the rigid bronchoscope represents a rare challenge for stent removal. To our knowledge, published techniques for silicone tubular stent removal via tracheostomy stoma do not exist.

Case Report:

Fifty two year old obese female with complex idiopathic subglottic stenosis, non-surgical candidate for tracheal resection and re-anastomosis, required a 14 x 40 mm hourglass silicone stent insertion after multiple prior endoscopic treatments. Twenty four hours later developed respiratory insufficiency, requiring emergent cricothyrotomy and distal stent dislodgement.

Elective open tracheostomy later performed but stent retrieval not feasible due to inability to advance any bronchoscope beyond the glottic anatomy. Multifactorial respiratory insufficiency ensued secondary to MRSA pneumonia and the tracheal stent's partial obstruction of the left mainstem bronchus takeoff. Subsequent formation of stent-induced main carinal granulation tissue complicated ventilatory support secondary to a very severe refractory cough. Stent removal was considered imperative to patient's recovery.

Three weeks later under general anesthesia, bronchoscopic intubation failed again due to persistent glottic and subglottic obstruction. As the tracheostomy's stoma was now mature, the decision to attempt stent removal via the stoma was made.

Herein we will describe and graphically illustrate our successful stepwise technique for creating loops along multiple longitudinal axes of the tracheal stent with the use of 2-0 silk sutures at different clock positions (ie. 3 and 9 o'clock). These suture loops will be used in conjunction with Kelly clamps to facilitate the safe removal of the tubular silicone stent via the tracheostomy's stoma.

Conclusion: A novel technique based on creating suture loops along multiple longitudinal axes in different clock positions of tubular stents, can safely facilitate stent removal via mature tracheostomy stomas in rare instances wherein rigid bronchoscopy is not feasible.

Disclosure of funding source(s): none

Abstract #33

Tracheostomy in the intensive care unit: Guidelines during COVID-19 worldwide pandemic

I. Carboni Bisso^{*a} (Dr), J. Montagne^a (Dr), M. Raices^a (Dr), V. Ruiz^a (Dr), F. Rosciani^a (Dr), A. Dietrich^a (Dr), D. Smith^a (Dr), M. Las Heras^a (Dr)

^a *Hospital Italiano de Buenos Aires, Buenos Aires, ARGENTINE*

Background:

COVID-19 has become a pandemic with significant consequences worldwide. About 3.2% of patients with COVID-19 will require intubation and invasive ventilation. Moreover, there will be an increase in the number of critically ill patients, hospitalized and intubated due to unrelated acute pathology, who will present underlying asymptomatic or mild forms of COVID-19. Tracheostomy is one of the procedures associated with an increased production of aerosols and higher risk of transmission of the virus to the health personnel. The aim of this paper is to describe indications and recommended technique of tracheostomy in COVID-19 patients, emphasizing the safety of the patient but also the medical team involved.

Materials and methods:

A multidisciplinary group made up of surgeons with privileges to perform tracheostomies, intensive care physicians, infectious diseases specialists and intensive pulmonologists was created to update previous knowledge on performing a tracheostomy in critically ill adult patients (> 18 years) amidst the SARS-CoV-2 pandemic in a high-volume referral center. Published evidence was collected using a systematic search and review of published studies.

Results:

A guideline comprising indications, surgical technique, ventilator settings, personal protective equipment and timing of tracheostomy in COVID-19 patients was developed.

Conclusions:

A safe approach to performing percutaneous dilational bedside tracheostomy with bronchoscopic guidance is feasible in COVID-19 patients if appropriate security measures are taken and a strict protocol is followed. Instruction of all the health care personnel involved is key to ensure their safety and the patient's favorable recovery.

Disclosure of funding source(s): none

Abstract #34

Feasibility of EBUS-TBNA for histopathological and molecular diagnostics of NSCLC - a retrospective single-center experience

KK. Marija*^a (Dr), H. Brunnström^a (Pr), J. Kosieradzki^a (Dr), L. Ek^a (Dr), J. Staaf^b (Mlle), S. Barath^a (Dr), P. Maria^b (Pr)

^a Department of Respiratory Diseases and Allergology, Skåne University Hospital, Lund, SUÈDE ; ^b Division of Oncology, Department of Clinical Sciences Lund, Lund University, Medicon Village, Lund, SUÈDE

Background: Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive bronchoscopic procedure, well established as a diagnostic modality of first choice for diagnosis and staging of non-small cell lung cancer (NSCLC). The therapeutic decisions for advanced NSCLC require comprehensive profiling of actionable mutations, which is currently considered to be an essential part of the diagnostic process.

Objectives: The purpose of this study was to evaluate the utility of EBUS-TBNA cytology specimen for simultaneous histological subtyping, molecular profiling of NSCLC by massive parallel sequencing (MPS), as well as for PD-L1 analysis.

Materials and methods: A retrospective review of 806 EBUS bronchoscopies was performed, resulting in a cohort of 132 consecutive patients with EBUS-TBNA specimens showing NSCLC cells in lymph nodes. Data on patient demographics, radiology features of the suspected tumor and mediastinal engagement, lymph nodes sampled, the histopathological subtype of NSCLC, and performed molecular analysis were collected.

Results: The EBUS-TBNA specimen proved sufficient for subtyping NSCLC in 83% and analysis of treatment predictive biomarkers in 77% (MPS in 53%). The adequacy of the EBUS-TBNA specimen was 69% for *EGFR* gene mutation analysis, 49% for analysis of *ALK* rearrangement, 36% for *ROS1* rearrangement, and 33% for analysis of PD-L1.

Conclusion: The findings of our study confirm that EBUS-TBNA cytology aspirate is appropriate for diagnosis and subtyping of NSCLC and largely also for treatment predictive molecular testing, although more data is needed on the utility of EBUS cytology specimen for MPS and PD-L1 analysis.

Disclosure of funding source(s):

Swedish Cancer Society (190473PjO1H),
Mrs. Berta Kamprads Foundation (FBKS-2020-7),
Crafoord's Foundation (20209975),
and Sjöberg's Foundation (2019-2011)

Abstract #35

Case Series of Bronchial Adenomas Treated with Cryoablation Therapy

N. Gomez^{*a} (Dr), JR. Gonong^a (Dr), D. Teo^a (Dr)

^a LUNG CENTER OF THE PHILIPPINES, Quezon City, PHILIPPINES

Introduction: Endobronchial lesions, especially tumors that fully obstruct the central airways, provide dilemma to interventional pulmonologists. In this case series, three patients with endobronchial obstruction will be discussed.

Cases: Case 1 had an incidental finding of an atelectatic right lung on chest x-ray. Her chest CT scan showed a collapse right lung, with obliterated right mainstem bronchus and enhancing nodular structure extending in the pre-bifurcation region. Case 2 had a recurrent non-productive cough for seven years. He had an incidental radiographic finding of homogenous opacification of the right lower lung field. His chest CT scan showed a heterogenous mass at the right infrahilar region extending to the carina. A partial obstruction of the right mainstem bronchus was also noted. Case 3 had productive cough with associated non-massive hemoptysis and shortness of breath. On chest x-ray, the entire left lung was noted atelectatic. Chest CT scan showed a soft tissue density at the main bronchus. All patients underwent fiberoptic bronchoscopy, cryoablation and cryo-recanalization of the obstructed airway.

Discussion and Conclusion: Cryotherapy is an important diagnostic and therapeutic modality for treatment for lung tumors, especially for tumors causing obstruction to main airways. Patients undergoing cryotherapy can provide immediate relief of obstructive signs and symptoms, can bridge patients in preparation for further definite surgical plans, provide less complications due to less invasive type of procedure, and a treatment option for patients with poor performance status who may not tolerate surgery. Bronchial adenomas, although slow progressing tumor, are still malignant neoplasms and timely detection and treatment by definitive surgical resection is needed to improve long term prognosis. Other treatment modalities like radiotherapy and chemotherapy are still under investigation.

Disclosure of funding source(s): none

Abstract #36

Mediastinal lymphadenopathy in a high TB endemic region - An uncommon intruder

N. Vennilavan^a (Dr), D. Bhatkar^a (Dr), GS. Grace^a (Dr), U. Bhattu^a (Dr), A. Ingle^a (Dr), V. Balasubramanian^{*a} (Dr)

^a *Yashoda Hospitals, Hyderabad, INDE*

Background:

Cryptococcus is an opportunistic infection caused by encapsulated organism *Cryptococcus neoformans* which is ubiquitous in nature. Though primary infection is by inhalation route with localisation to lungs, dissemination to CNS, skin, bone and other viscera are reported in those with severe immunosuppression. Pulmonary cryptococcus most commonly manifests as multiple scattered lung nodules and consolidation. Isolated mediastinal lymphadenopathy secondary to cryptococcus in an immunocompromised patient is extremely rare. Here we present a case of isolated mediastinal lymphadenopathy secondary to cryptococcus in a patient with human immunodeficiency virus diagnosed with endobronchial ultrasound in a high tuberculosis endemic region.

Introduction:

A 50 year old lady with no known prior comorbidities presented with complaints of low grade fever, loss of appetite and loss of weight for 2 months. There was no history of cough, breathlessness, hemoptysis and fever. Her vitals were normal. On routine evaluation she was found to be HIV reactive with CD4 counts of 66 cells/micL. Chest Xray PA showed mediastinal widening. HRCT Chest revealed right paratracheal and subcarinal lymphadenopathy with normal lung parenchyma. She was then subjected to EBUS TBNA with a high pre procedure suspicion of tuberculosis. On TBNA ROSE giant cells along with fungal elements were seen with budding yeast cells. EBUS TBNA India ink stain showed budding yeast cells with halo around in a black background suggestive of cryptococcus which was confirmed with fungal culture. TBNA CBNAAT was negative for TB. Patient was initiated on anti retroviral treatment along with fluconazole based on drug susceptibility testing.

Conclusion:

To the best of our knowledge this is the first case report of cryptococcal mediastinal lymphadenopathy diagnosed by endobronchial ultrasound in a patient with HIV in a high TB endemic region.

Disclosure of funding source(s): none

Abstract #37

Transbronchial needle aspiration combined with cryobiopsy in the diagnosis of mediastinal diseases: a randomised trial

Y. Fan^a (Dr), ZS. Huang^a (Dr), K. Kontogianni^b (Dr), XL. Wu^a (Dr), K. Sun^c (Dr), WL. Fu^a (Dr), WM. Kuebler^d (Pr), FJ. Herth^{ab} (Pr)

^a Xinqiao Hospital, Third Military Medical University, Chongqing, China, Chongqing, CHINE ; ^b Thoraxklinik, and Translational Lung Research Center Heidelberg, University of Heidelberg, Heidelberg, Germany, Heidelberg, ALLEMAGNE ; ^c Three Gorges Central Hospital, Chongqing University, Chongqing, China, Chongqing, CHINE ; ^d Charité Universitätsmedizin, Berlin, Germany, Berlin, ALLEMAGNE

Background: Transbronchial mediastinal cryobiopsy is a novel sampling technique for mediastinal disease. Despite of few lung cancer misdiagnoses, its improved diagnostic yield for non-lung cancer lesions compared to endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA), suggests it as a potential complementary technique to conventional biopsy. This randomised study determined the safety profile and added value of the combined use of transbronchial mediastinal cryobiopsy and the standard EBUS-TBNA.

Methods: Patients with at least one mediastinal lesion of 1 cm or more in the short axis that needs diagnostic bronchoscopy were enrolled from hospital sites in Europe and China. Participants were randomly assigned to the combined use of EBUS-TBNA and transbronchial mediastinal cryobiopsy (combined group) or EBUS-TBNA alone (control group) in a 1:1 ratio. Co-primary endpoints were procedure-related complications and diagnostic yield. This study is registered with ClinicalTrials.gov, number NCT04572984.

Results: Between Oct, 2020 and Sep, 2021, 271 patients were recruited and randomly assigned: 136 to the combined group and 135 to the control group. The addition of cryobiopsy to standard sampling significantly increased the overall diagnostic yield for mediastinal lesions, as shown by either “between-group” (92.6% versus 80.7%, $P=0.004$) or “within-patient” (94.0% versus 82.1%, $P=0.003$) analyses. Diagnostic yields were similar for mediastinal metastasis (98.6% versus 98.6%, $P=1.00$), while the combined approach was more sensitive than standard needle aspiration in benign disorders (93.8% versus 66.7%, $P=0.001$). Furthermore, the combined approach resulted in an improved suitability for molecular and immunological tests of non-small cell lung cancer. The incidence of adverse events related to biopsy procedure did not differ between the combined and control group, and no severe complications leading to death or disability were reported.

Conclusion: The addition of mediastinal cryobiopsy to EBUS-TBNA resulted in a significant improvement of the diagnostic yield for mediastinal diseases, with a reassuring safety profile.

Disclosure of funding source(s): none

Abstract #38

Transbronchial cryo-biopsy in pulmonary Langerhans cell histiocytosis: a case report

Y. He^a (Dr), Y. Xiao^{a*} (Pr), Y. Chen^a (Dr), Y. Liu^a (Dr), Z. Li^a (Dr), Y. Yang^b (Mlle)

^a First department of Respiratory Medicine, Ya'An Hospital Affiliated to Kunming Medical University, Kunming, Yunnan, China, Kunming, Yunnan, CHINE ; ^b First department of Respiratory Medicine, Ya'An Hospital Affiliated to Kunming Medical University, Kunming, Yunnan, China, Kunming, Yunnan, CHINE

Background: Langerhans cell histiocytosis (LCH) is a rare systemic disorder characterized by the accumulation of CD1a+/Langerin+ LCH cells and wide-ranging organ involvement. The atypical LCH is difficult to confirm. There are relatively little data regarding the utility of transbronchial cryo-biopsy (TBCB) for this disorder.

Content: Authors report a case of a 46-year old man with pulmonary Langerhans' cell histiocytosis who presented with chronic cough and chest distress. Imaging of the chest showed characteristic small nodules and thin-walled cysts. This PLCH case hasn't peripheral lymph node involvement. Diagnosis is hard to confirm without transbronchial cryo-biopsy (TBCB). No major complications occurred during TBCB. We carried out a diagnostic work-up which included laboratory and radiographic analysis, bronchoscopy.

Conclusion: TBCB is a safe and effective minimally invasive modality for the diagnosis of PLCH and should be the initial method of obtaining diagnostic specimens.

Disclosure of funding source(s): none

Abstract #39

Endobronchial removal of the peripherally located foreign body with the ultrathin bronchoscopy and ultrathin cryoprobe guided by a manual navigating method

M. Yuan^a (Dr), F. Ni^a (Dr), Y. Xiao^a (Dr), W. Yin^a (Dr), Y. Hu^{*a} (Dr)

^a *Central Hospital of Wuhan, Wuhan, CHINE*

Background: Bronchoscope is a preferential method used to diagnose and remove airway foreign bodies, while for peripherally located foreign bodies, how to locate and remove them remains an intractable problem.

Case presentation: We herein report a chronic aspiration case with a tiny chili incarcerated in LB10ciiβ, with obvious granulation tissue. We used manual navigating method to locate the lesion. Firstly, we read his thin-section CT images and a three-dimensional CT image reconstruction. Then, we traced the bronchial branch in which the lesion was located by rolling thin-section CT images continuously, and recorded them with a bronchial opening sketch, marking the leading bronchus at every bifurcation point. Thus, a simulated image of endoscopic image was made. Therapeutic bronchoscope couldn't proceed into the target bronchus. While ultrathin bronchoscope successfully found the foreign body. But the chili was too tender to be extracted completely by forceps, and it was even pushed further away. Then 1.1 mm ultrathin cryoprobe was used, with an activation time of 4s, and the chili was frozen and completely removed.

Conclusion: Combined use of manual navigating method, ultrathin bronchoscope and ultrathin cryoprobe, which can easily bend and extend to the distal bronchus, and harvest large specimens by the movement of freezing and pulling out the probe, could successfully extract foreign bodies lodged in the distal airways and avoid thoracic surgery.

Disclosure of funding source(s): none

Abstract #40

Improvement in the Management of nontuberculous mycobacteria after lobar collapse therapy with endobronchial valves (EBV).

V. Luzzi^a (Dr), J. Mencarini^b (Dr), L. Corbetta^c (Pr)

^a *Interventional Pulmology, AOU Careggi, Florence, ITALIE* ; ^b *Infectious Disease, AOU Careggi, Florence, ITALIE* ;

^c *Interventional Pulmonology, AOU Careggi, Florence, ITALIE*

BACKGROUND: The incidence of Non Tuberculous Mycobacteria (NTM) has been increasing worldwide. The treatment success rate is unsatisfactory with a successfully eradicate in 60-80% of patients with a significant proportion of successfully treated patients experience disease recurrence. In a study of Corbetta [1], the Zephyr® EBV have been using in the successful management of inoperable cases of MDR and XDR-TB with cavities.

AIM: We describe our first case series of NTM with cavities not responder to therapy or/and relapsed treated with EBV as treatment adjunct to pharmacotherapy in order to accelerate the healing of the patients and increase our experience whilst awaiting the start of a randomized protocol.

METHODS: We recruited patients in Florence and EBV were implanted using a rigid bronchoscopy in general anesthesia. The number of implanted valves depended on the endobronchial anatomy of each patients.

RESULTS: We treated 3 patients (2F/1M) with *M. Xenopi* (2/3) and *M. Avium* complex (1/3). Sputum were positive at the time of the procedure . Target of EBV placement were the cavities that were located Right upper lobe (2/3) and right lower lobe (1/3). A median of 3 valves were inserted. Loss of volume of the treated lobe and cavities were seen in all patients. No complications were observed after procedure. Sputum at 3 months were negative.

CONCLUSIONS: Our early experience showed benefit in terms of conversion of sputum smear and culture to negative and radiological closure or reduction in size of the cavities with no complications. After these further demonstration of efficacy, our group is working on developing a prospective and randomized study.

Disclosure of funding source(s): none

Abstract #41

Artificial tumor targets simulating peripheral nodules in isolated pig lung models

W. Ting^a (Dr), W. Juan^a (Dr), L. Yan^a (Dr), K. Yingying^a (Dr), J. Yankun^a (Dr), N. Jinmu^a (Dr), Z. Jie^{*a} (Pr)

^a *Beijing Tiantan Hospital, Capital Medical University, Beijing, CHINE*

Background An appropriate model of peripheral pulmonary nodules is helpful for evaluating new technologies for the diagnosis and treatment of peripheral pulmonary lesions and reducing the risk of clinical trials. Human cadaveric model for peripheral nodules has been described in a few studies, however, animal models has not been reported. This article described our effort to create artificial tumor targets simulating peripheral nodules in isolated pig lungs.

Methods According to the method of Alexander C. Chen et.al described, an aqueous solution of 10% gelatin, 2% agar, 0.1% iodinated contrast, and little colored mica powder was heated to 90°C during mixing and was maintained as solution at 45°C to 50°C before injection. The warmed solution was drawn into a 5-mL syringe and was injected transthoracically into the lung parenchyma or bronchoscopically into the lung periphery through a radial probe guide sheath, respectively. Approximately 3 to 5 mL of this solution was used per artificial tumor target. CT scans were performed following injection using slice thickness of 1 mm. The maximum diameter analysis of simulated tumor targets was performed.

Results When injected the solution bronchoscopically, it is easy to flow along the bronchus and artificial tumor targets is hard to be created. In contrast, inject the solution transthoracically is a better way. The volume of material injected was recommend controlled within 2-3 ml which could create lesions 10-30 mm in diameter. The injection depth was recommended 1.5-2cm from skin which could provide a heterogenous distribution of peripheral pulmonary lesions. However, most of these lesions were without bronchus sign.

Conclusions Artificial tumor targets visible by chest CT could be created in isolated pig lungs, and injection transthoracically may be better than bronchoscopically. However, further effort is still needed to establish an ideal model.

Disclosure of funding source(s):

This study was supported by the grant from Beijing Municipal Administration of Hospitals Incubating Program (grant number: PX2021022) and Beijing Municipal Key Clinical Specialty Project (grant no.2020-129).

Abstract #42

A study on the Epithelial-mesenchymal transition in animal model of cicatricial airway stenosis

W. Ting^a (Dr), L. Yanping^a (Dr), L. Yan^a (Dr), N. Jinmu^a (Dr), Z. Jie^{a*} (Pr)

^a *Beijing Tiantan Hospital, Capital Medical University, Beijing, CHINE*

Background The treatment of cicatricial airway stenosis is currently a difficult problem in the field of interventional pulmonology. The pathogenesis is still unclear and studies are limited. Several studies have confirmed the transformation of tracheal epithelial cells into mesenchymal cells (Epithelial-mesenchymal transition, EMT) during the airway remodeling which occurred after lung transplantation, however, whether this mechanism works in the process of cicatricial airway stenosis is unclear. In this study, we intend to study the damage and repair of airway epithelial cells in cicatricial airway stenosis and the imbalance of epithelial/mesenchymal cells, in order to explore the mechanism of the formation of cicatricial airway stenosis.

Methods Eight rabbit cicatricial airway stenosis animal models were established. Normal airway epithelium and airway scar tissue specimens from animal models at different time points (14 days, 1 month, 2 months, and 3 months after epithelial injury) were obtained. The progressive expression of the epithelial marker (E-Cadherin) and the mesenchymal marker (α -smooth muscle actin, α -SMA), and the ratio between them were compared. The progressive expression of EMT marker (MMP-9) were also observed to confirm whether EMT occurred in cicatricial airway stenosis and the relationship between the degree of EMT and the cicatricial airway stenosis formation.

Results Compared with the normal airway epithelium, the expression of E-Cadherin was down-regulated in airway scar tissue, the expression of α -SMA was up-regulated, and the ratio of E-Cadherin to α -SMA was decreased, too. With the progress of cicatricial airway stenosis, the expression of MMP-9 was increased progressively.

Conclusions The cicatricial airway stenosis formed after the injury of the airway mucosa in rabbits has the process of EMT. With the progress of cicatricial airway stenosis, the degree of epithelial cells to mesenchymal transition was increased. This may provide new therapeutic targets for the disease.

Disclosure of funding source(s):

This study was supported by the grant from Beijing Municipal Administration of Hospitals Incubating Program (grantnumber:PX2021022) and Beijing Municipal Key Clinical Specialty Project(grantno.2020-129).

Abstract #43

Unusual sites of metastasis of Non-small Cell Lung Cancer

C. Marginean^{*a} (Dr), N. Laszlo^a (Dr), G. Gabriel^a (Dr), CA. Man^a (Dr)

^a *Mures County Hospital, Targu-Mures, ROUMANIE*

Introduction:

Lung cancer is the second most frequent type of cancer for both males and females and the leading cause of tumor-related deaths worldwide. The most frequent metastases sites are nervous system, liver, bones, respiratory system and the adrenal glands. Skeletal muscle metastases from lung cancer are an extremely rare phenomenon (due to the contractile properties of the muscle cells and the local pH).

Case report:

We present a case of a 61-year-old Caucasian male, admitted in our clinic for daily fever, dyspnea on effort, cough with mucopurulent sputum, asthenia, weight loss and an oval shaped tumor on the left gluteal region. Contrast thoracic CT scan was performed and it revealed a peripherally posterior ILD cavity 44/32 mm in axial diameters, with iodophilic walls and irregular edges and thickness up to 13 mm, suggesting for a lung tumor. At the bilateral hilum level and at the middle and posterior mediastinum level multiple lymphadenopathies, some with central necrosis, up to 41/16 mm were described, right pleurisy 36mm. Iodophilic lesions located in the bilateral gluteal muscles (13 mm on the right, 46 mm respectively 16 mm on the left side) were identified. A similar lesion was described in the left deltoid muscle. Histopathological examination of the lung biopsy revealed a pulmonary adenocarcinoma, and the skeletal muscle biopsy confirmed the metastatic origin of the lesions. The patient was sent to oncological treatment.

Conclusion:

The particularity of this case is the presence of an ipsilateral identical shaped skeletal muscle metastasis on the lower and upper limb from a non-small cell lung cancer is unique. This finding highlights the importance of the differential diagnosis in patients presenting skeletal muscle lesions admitted in hospital for lung tumors.

Disclosure of funding source(s): none

Abstract #44

Novel data on needle technique at EBUS TBNA shows as few as 3 agitations of the needle is enough for adequate DNA on smears along with avoiding erythrocyte contamination of the smears.

D. Fielding^a (Dr), A. Dalley^b (Dr), P. Simpson^b (Dr), K. Nones^c (Dr), V. Lakis^c (Dr), S. Sharma^c (Dr)

^a RBWH, Brisbane, AUSTRALIE ; ^b University of Queensland Centre for Clinical Research, Brisbane, AUSTRALIE ; ^c Queensland Institute for Medical Research Berghofer, Brisbane, AUSTRALIE

Background:

Optimising the EBUS TBNA needling technique is important to maintain procedural simplicity and maximise sample quality. The number of agitations of the needle within the lymph node has not been studied for lung cancer, nor has which component of the content is placed on the smear- the first or the last drops out of the needle. Fewer agitations might mean less trauma to the node, but it would be important to confirm adequate DNA was available.

Methods:

We prospectively explored three versus 10 agitations of the needle in sequential passes into the lymph node using separate needles in EBUS TBNA for malignant nodes. Resulting Diff-Quik cytology smears were quantitatively assessed using microscopic (tumour cell cellularity, abundance scores, erythrocyte contamination) and DNA yields.

Results:

In 86 patients (45M, 41F), a mean of 5.3 smears were made per patient with a total of 459 smears scored by pathologists, and 168 paired smears extracted for DNA. There was significantly less contamination by erythrocytes from three agitations (X^2 $p=0.008$) as judged by microscopy. There was no significant difference between three versus 10 agitations for smear microscopy cellularity ($p=0.29$) however there was significantly higher cellularity in smears made from the last drops out of the needle compared to the first drops ($p=0.01$). Overall there was no difference in DNA yield (469ng vs 488 ng, $P=0.84$) or DNA integrity ($p=0.20$). However there was significantly more DNA in the first pass into the node using three agitations than with other passes and with 10 agitations (Pass * Agitations interaction, $p=0.031$).

Conclusions:

Three agitations is non-inferior to 10 agitations for overall abundance of malignant cells and DNA content on smears. A smear with adequate DNA for panel sequencing could almost always be made with the first needle pass using three agitations.

Disclosure of funding source(s):

Cancer Australia
Cancer Council Queensland
Olympus Australia

Abstract #45

EBUS TBNA Diff Quik smears have highly predictable DNA content and great feasibility for large 500 gene panel testing in lung cancer, even in smears with low cellularity.

D. Fielding^a (Dr), A. Dalley^b (Dr), P. Simpson^b (Dr), K. Nones^c (Dr), V. Lakis^c (Dr), S. Sharma^c (Dr)

^a RBWH, Brisbane, AUSTRALIE ; ^b University of Queensland Centre for Clinical Research, Brisbane, AUSTRALIE ; ^c QIMR Berghofer, Brisbane, AUSTRALIE

Background

Diff quik smears are commonly collected at EBUS TBNA procedures. These smears are not commonly used for molecular analysis, despite reports of insufficient cell block material. Studies to demonstrate the great potential of smears are needed in a wide range of smear cellularities. Novel extended sequencing panels need assessment also.

Methods.

This was a prospective study of patients having EBUS TBNA for malignant lymph nodes. Rapid on-site assessment (ROSE) Diff quik smears and cell block were made in all patients. Smears had microscopy for percent malignant cellularity then were extracted for DNA content. A subset of these smears were sequenced using the TSO500® panel.

Results

A total of 181 smears from 66 patients with lung malignancy were analysed. Microscopy for percent malignant cells on the smears was highly predictive of DNA amount. DNA yield ranged from 79 to 12,000ng and mean DNA yield for each quartile of percent cellularity (<25%, 25-50%, 50-75% and >75%), showed significant differences in DNA yield ($p < 0.05$). DNA from 52 smears underwent TSO500® sequencing: 12 had <25% malignant cells, 13 25-50%, 6 50-75% and 20 had >75%. 51/52 samples produced libraries, but 4 failed coverage on vendor Quality Control. These 4 had <25% cellularity, and smear surface area on the slide was very low (< 25%) in 3. Tumour mutation burden and Microsatellite instability was reportable for 46 smears. A total of 40 smears from 13 patients with known mutations (from cell block) confirmed mutations in all smears. Additional targetable mutations were found in smears from 2 patients (KRAS and PIK3A) where cell block was insufficient.

Conclusions

Microscopy is highly predictive of DNA content on smears. DNA from smears can successfully be sequenced with a large panel in most smears even when low in cellularity providing a reliable alternative to cell block extraction.

Disclosure of funding source(s):

Cancer Australia

Cancer Council of Queensland

Olympus Australia

Abstract #46

Pulmonary Blastoma that was first diagnosed as dedifferentiated chondrosarcoma using Medical Thoracoscopy: A case report

TH. Kim^a (Dr), JH. Jeon^b (Pr), JH. Chung^c (Pr), YJ. Cho^{*a} (Pr)

^a Divisions of Pulmonary and Critical Care Medicine, Department of Internal medicine, Seoul National University College of Medicine, Seoul National University Bundang Hospital, Seongnam, CORÉE, RÉPUBLIQUE DE ; ^b Department of Thoracic and Cardiovascular Surgery, Seoul National University College of Medicine, Seoul National University Bundang Hospital, Seongnam, CORÉE, RÉPUBLIQUE DE ; ^c Department of Pathology, Seoul National University College of Medicine, Seoul National University Bundang Hospital, Seongnam, CORÉE, RÉPUBLIQUE DE

Background

Pulmonary blastoma is a rare and highly aggressive malignancy, constituting about 0.5% of all lung tumors. The tumor is composed of low-grade fetal adenocarcinoma and primitive mesenchymal cells showing various degrees of differentiation.

Case report

We report a 65-year-old man with 1 pack per day of smoking for 15 years. The patient complained of mild dyspnea and right-side chest discomfort and a chest X-ray showed right-side pleural effusion. Diagnostic thoracentesis was performed but the result was exudate nature but inconclusive (polymorpho-nuclear cell 12%, mononuclear cell 88%, ADA 19 IU/L, negative for malignant cells in cytology). Medical thoracoscopy (MT) was performed for the final diagnosis. All the pleural space was multi-septated, and severe adhesion in the pleura space was observed including a whitish mass-like lesion between the lung basal and the pleura. Multiple biopsies were done from the involved pleura and the mass. There was no endobronchial tumorous lesion in bronchoscopy. According to the pathological results, the pleura tissue showed granulation tissue without malignancy, and the white mass was diagnosed as dedifferentiated chondrosarcoma (positive for S-100 and CD99, negative for CD 34, calretinin, STAT6, D2-40).

After a multidisciplinary discussion, the patient was treated with exploratory video assisted thoracoscopic surgery. Much pleura area was dissected and a huge mass of the right lower lung was observed during surgery. Bilobectomy including decortification was performed finally. The final pathology was confirmed as pulmonary blastoma [primitive mesenchymal area (40%), chondrosarcoma (50%), adenocarcinoma (5%), and osteosarcoma (5%)], and pleural metastasis was confirmed. Additional chemotherapy is being administered.

Conclusion

MT is useful for the diagnosis of indeterminate pleural effusion, however, cautions are also needed when confirming rare malignancy such as pulmonary blastoma.

Disclosure of funding source(s): none

Abstract #47

Radial EBUS guided mini cryobiopsy without blocker balloon can safely diagnose non-malignant and malignant peripheral pulmonary lesions

K. Bennett^{*a} (Dr), M. Salamonsen^a (Dr)

^a Fiona Stanley Hospital, Perth, AUSTRALIE

Background: Transbronchial lung cryobiopsy overcomes many limitations of forceps biopsy, including increased sample size and reduced crush artefact. Application of cryobiopsy to diagnose peripheral pulmonary lesions (PPLs) has been limited due to difficulty guiding the cryoprobe to the correct location and concerns over bleeding. We hypothesise that using radial-EBUS to exclude at-risk vessels followed by 1.1mm mini cryobiopsy without blocker balloon will be safe and effective to diagnose PPLs.

Method: Participants underwent bronchoscopy with a single proceduralist between July 2020 and February 2022. All had radial-EBUS localisation of PPLs via guidesheath. Following FNax2, radial-EBUS was used to select a biopsy location without adjacent blood vessels. Under fluoroscopic guidance, a single cryobiopsy (1.1mm probe, freeze time 12sec) was taken and the bronchoscope removed en bloc for retrieval. BAL was subsequently collected. No patients had a blocker balloon.

Results: 39 procedures were included, 56% in males with a median age of 69. Average lesion size was 31mm and location according to CT third was predominantly middle(30%), outer(24%), or both(19%). Overall diagnostic yield of cryobiopsy was 49%(19/39) but for non-malignant conditions was 67%(4/6). A further 5 malignant cases were diagnosed from BAL/FNA (total yield 62%). Of the cases where no diagnosis was obtained, 2/15 cases still have no confirmed diagnosis and 2/15 were later diagnosed benign. 11/15 were later diagnosed malignant, in one of these cases the cryobiopsy freeze time had been reduced to 6 seconds due to a nearby vessel on EBUS.

One pneumothorax (11mm) and one episode of mild but persistent bleeding requiring bronchoscope wedging and tranexamic acid occurred.

Conclusion: Radial-EBUS guided mini cryobiopsy through guidesheath without blocker balloon is safe and effective for diagnosing PPLs. It has a particular advantage for the diagnosis of non-malignant conditions. More research is required to determine optimal technique.

Disclosure of funding source(s): none

Abstract #48

Role of BAL in COVID-19 patients: a prospective multicenter study

L. Ciani^a (Dr), J. Guiot^b (Pr), C. Ravaglia^c (Dr), V. Luzzi^d (Dr), L. Giuntoli^d (Dr), L. Gori^d (Dr), E. Benoit^b (Pr), E. Berillo^e (Dr), A. Morettini^f (Dr), C. Nozzoli^f (Dr), C. Nardi^g (Pr), A. Peired^h (Dr), F. Morecchiatoⁱ (Dr), F. Lavorini^f (Pr), M. Matucci Cerinic^f (Pr), R. Gian Mariaⁱ (Dr), S. Polliniⁱ (Dr), L. Maggi^e (Dr), F. Annunziato^e (Pr), V. Poletti^c (Pr), S. Tomassetti^d (Pr)

^a Department of Experimental and Clinical Medicine, Careggi University Hospital, Florence, Italy, Firenze, ITALIE ;

^b Respiratory Department, CHU Liège, Liège, Belgium., Liege, BELGIQUE ; ^c Department of Respiratory and Chest Diseases GB Morgagni-Forlì Hospital (FC)/University of Bologna, Forlì, ITALIE ; ^d Department of Experimental and Clinical Medicine, Careggi University Hospital, Florence, Italy, Florence, ITALIE ; ^e Department of Experimental and Clinical Medicine, University of Florence, Careggi University Hospital, Florence, Italy, Florence, ITALIE ; ^f Department of Experimental and Clinical Medicine, Careggi University Hospital, Florence, Italy., Florence, ITALIE ; ^g Department of Experimental and Clinical Biomedical Sciences Mario Serio, University of Florence, Azienda Ospedaliera Universitaria Careggi, Florence, Italy., Florence, ITALIE ; ^h Department of Experimental and Clinical Biomedical Sciences "Mario Serio", University of Florence, Florence, Italy., Florence, ITALIE ; ⁱ Department of Experimental and Clinical Medicine, University of Florence, and Clinical Microbiology and Virology Unit, Careggi University Hospital, Florence, Italy., Florence, ITALIE

Introduction

The present study is part of DRAGON, a prospective multicentre European project aimed at improving the diagnosis of COVID-19.

Primary aim of this study is to evaluate BAL role in detecting coexisting infections. Secondary aims are BAL impact on the management of COVID patients, characteristics of BAL cellularity in COVID patients, safety of BAL in COVID patients and healthcare providers.

Methods

The study was carried out in 2021 at Careggi University Hospital in Florence, CHU of Liege and Morgagni Hospital Forlì.

The procedure was carried out in hospitalized COVID-19 patients. All patients underwent BAL for microbiological and cytological analysis. 115 patients were enrolled.

Results

Coinfections were detected in 35 out of 115 patients. Once coinfection was identified, patients received targeted antibiotic therapy and showed improvement in symptoms after initiation of antibiotic therapy.

In the remaining patients without coinfections, BAL negativity for other pathogens favored discontinuation of empiric antibiotic therapy.

In 34% of cases, we demonstrated the presence of lymphocytic alveolitis; in 49% of cases a neutrophilic alveolitis, and in 7% of cases a mixed lymphocytic/neutrophilic alveolitis.

BAL was positive for Sars-Cov-2 in all cases, 7 PCR nasal swab performed at the time of the BAL were negative.

No major adverse events were demonstrated in the 24 hours after BAL in enrolled patients. No patients required an increase intensity of care after the procedure.

There were no cases of infection among health care workers involved in bronchoscopic procedures.

Conclusion

Coinfections in COVID-19 patients are common. BAL is a safe tool to identify the presence of coinfections and help clinicians manage these patients correctly.

BAL cellularity in covid patients shows a predominance of neutrophils, particularly in cases of coinfection. Our data, in line with previous studies, suggests an earlier negativisation of nasopharyngeal swab compared to BAL

Disclosure of funding source(s): none

Abstract #49

Bronchoscopic intervention In management of post intubation trachea stenosis - experience from a tertiary care centre from south India

RK. Manoharlal^{a*} (Dr), H. Gonuguntla^a (Dr), DG. Mascarenhas^a (Dr), N. Bhanuteja^a (Dr), P. Vidyasagar^a (Dr), AR. Manohar^a (Dr)

^a *Yashoda Hospital, Hyderabad, INDE*

Background:

Tracheal stenosis is a potentially life-threatening condition. Tracheostomy and endotracheal intubation remain the commonest causes of benign stenosis, despite improvements in design and management of tubes. Treatment of Post intubation tracheal stenosis (PITS) is still controversy as there is no international consensus on management of the same.

Aim:

To describe our bronchoscopic interventional experience and the role of silicon stents in management of benign tracheal stenosis.

Methods and material:

A prospective observational study was conducted in our institute spanning over a period of one year from April 2021 to March 2022. All patient referred for treatment of PITS were taken into study. These patients will be followed up for a period of 6 months and results compiled.

Results:

Seventeen patients were included in our study. Sixteen were males and one female with mean age of 31 years. The presenting symptoms were cough, stridor and breathlessness. The average duration of intubation was 5 days. Mean duration from extubation to development of symptoms was 2 weeks. Two third of patients had complex tracheal stenosis. The most common etiology was road traffic accident followed organophosphorus poisoning. Out of 17 patients, 16 underwent silicon stent placement and one patient underwent serial balloon dilatation. Follow up results will be presented during the conference.

Conclusion:

Though many studies prefer surgical repair as first choice for benign tracheal stenosis, our study has shown excellent results with silicon stent placement. We recommend a silicon stent placement for all complex stenosis cases.

Disclosure of funding source(s): none

Abstract #50

Management of Endobronchial TB (EBTB) stenosis - Experience from a tertiary care center from South India

DG. Mascarenhas^a (Dr), H. Gonuguntla^a (Dr), RK. Manoharlal^a (Dr), MAI. Khan^a (Dr), P. Vidyasagar^a (Dr)

^a *Yashoda Hospital, Hyderabad, INDE*

Background:

India accounts for 26 % of global burden of tuberculosis (WHO Global report 2021). Approximately 6-50 % of these cases have Endobronchial TB, however the true incidence and complications of EBTB is unknown as routine bronchoscopy is not performed in all tuberculosis cases. Despite Anti tuberculous treatment (ATT) and steroid therapy , development of bronchial stenosis is usually irreversible and requires either bronchoscopic or surgical intervention to restore airway patency.

Aim:

To describe our bronchoscopic interventional experience in post TB endobronchial stenosis.

Methods and material:

A prospective observational study was conducted in our institute spanning over a period of one year from April 2021 to March 2022. All patients referred for treatment of post TB endobronchial stenosis were taken into study. These patients will be followed up for a period of 6 months post procedure and results compiled.

Results:

Sixteen patients were included in our study. Six were males and ten females with a mean age of 29 years. The most common presenting symptoms were cough and progressive breathlessness. The average duration of completion of ATT to development of symptoms was 3 months. Out of sixteen cases, 13 had left bronchial tree involvement and and three had right bronchial tree involvement. All patients underwent electrocautery and balloon bronchoplasty and one patient underwent stenting. All patients had significant reduction in symptoms immediately post procedure. All patients are being followed up with surveillance bronchoscopy and results will be presented during the conference.

Conclusion:

Balloon bronchoplasty offers significant immediate relief of respiratory symptoms in post tb stenosis and is a valuable alternative to surgical interventions.

Disclosure of funding source(s): none

Abstract #51

Using insulation-tipped knife for rigid bronchoscopic dilatation of benign tracheobronchial stenosis

JE. Han^a (Dr), C. Kim^{*a} (Dr)

^a Department of Internal Medicine, Jeju National University Hospital, Jeju National University School of Medicine, Jeju, COREE, RÉPUBLIQUE DE

Background: Tracheal or bronchial laceration is a potential complication of rigid bronchoscopy. This study aimed to investigate the acute complications and outcomes of using an insulation-tipped (IT) knife in combination with rigid bronchoscopic dilatation for treating benign tracheobronchial stenosis.

Methods: We conducted a chart review of patients with benign tracheobronchial stenosis who were treated with rigid bronchoscopy and an IT knife at two referral centers. Treatment success was defined as a clinically stable state without worsening symptoms after 3 months of treatment.

Results: Of the 23 patients with benign tracheobronchial stenosis, 15 had tracheal stenosis and 6 had main bronchial stenosis. Among them, three cases were of simple stenosis (13%), while the others were of complex stenosis (87%). The overall treatment success rate was 87.0%. Pneumomediastinum and subcutaneous emphysema occurred due to bronchial laceration in two cases of distal left main bronchial stenosis (8.7%), and no other significant acute complications developed. Silicone stents were inserted in 20 patients, and successful stent removal was possible in 11 patients (55.0%). Six of the seven stents inserted in patients with post-intubation tracheal stenosis were removed successfully (85.7%). However, most of the patients with post-tracheostomy tracheal stenosis required persistent stenting (80%). Pulmonary function was significantly increased after treatment, and the mean increase in the forced expiratory volume in 1 s was 391 ± 171 mL (160-700 mL).

Conclusion: The combined use of an IT knife with rigid bronchoscopy can be suggested as an effective and safe modality for treatment of benign tracheobronchial stenosis. This technique may help in loosening the dense fibrotic stenosis and facilitate mechanical bougienage with a lower risk of airway injury.

Disclosure of funding source(s): none

Abstract #52

Iriscope®, a new mini-camera to evaluate small peripheral lung nodules

O. Taton^{*a} (Dr), B. Bondue^a (Pr), D. Leduc^a (Pr)

^a *Hôpital Erasme, Université Libre de Brussels, Brussels, Belgium, Bruxelles, BELGIQUE*

Background

With the increasing use of CT scans, numerous pulmonary nodules are detected. As a majority of them are benign, development of efficient non-surgical diagnostic procedure is mandatory. However, a direct endobronchial view of small peripheral pulmonary nodules is currently unavailable. Therefore, Iriscope®, an ultra-thin video-endoscopic probe of 1.7 mm, was developed to be inserted in the working channel of the bronchoscope to achieve a direct view of peripheral (outer third) nodules unreachable by videobronchoscopes.

We report here the first case describing the direct endobronchial view and appearance of a peripheral non solid nodule of 16 mm by Iriscope® during an electromagnetic navigation bronchoscopy (ENB) guided by cone beam CT (CBCT).

Case report

A 55 year old woman, with a heavy smoking history, underwent a screening low dose chest CT scan in 2019. A non solid nodule of 14 mm was identified in the outer third of the right upper lobe. During the next two years of follow-up, the nodule size and the FDG uptake increased (from 14 to 16 mm and SUV from 1.2 to 5).

The patient underwent transbronchial cryobiopsy guided by Iriscope®, ENB and CBCT. After the navigation catheter was assumed to be in the correct position according to the CBCT, an abnormal endobronchial lesion (whitish plaque) was observed by Iriscope® when it was inserted through the extended working channel.

The pathological diagnosis was adenocarcinoma confirmed by surgery (T1bN0M0).

Conclusions

For the first time, a ultra-thin video-endoscopic probe (Iriscope®) allows to achieve a direct endobronchial view of a small peripheral malignant nodule. Additional small peripheral nodules have to be evaluated by the Iriscope® in order to better define normal and pathological images as well as the beneficial impact of this new technology on the diagnostic efficiency of small peripheral pulmonary nodules.

Disclosure of funding source(s):

Lys Medical (Waterloo, Belgium) developed and provided the Iriscope®. Benjamin Bondue and Dimitri Leduc received consultancy fee and have stock options in Lys Medical Society.

Abstract #53

Ultrasound-guided trucut biopsy of lymph node - is it interventional pulmonologist forte?

A. Alaga^{*a} (Dr), G. Balakrishnan^a (Dr), C. Huan Keat^b (M.)

^a Pulmonology Department, Hospital Sultanah Bahiyah, Alor Setar, MALAISIE ; ^b CRC Department, Hospital Sultanah Bahiyah, Alor Setar, MALAISIE

Background: A spectrum of disease which investigated by pulmonologist can lead to cervical and axillary lymphadenopathy. Ultrasound(US) has revolutionised respiratory investigations and US-guided trucut biopsy of lymph nodes is an additional important skill for Pulmonologists. In Malaysia, cervical and axillary node biopsy usually done by Radiologists, Otorhinolaryngologist, and Surgeons. Our centre is first in Malaysia, where the US-guided trucut biopsy done by an Interventional Pulmonologist.

Objectives: We aimed to assess the feasibility of US-guided trucut biopsy of cervical and axillary lymph nodes performed by an Interventional Pulmonologist in the workup of patients with respiratory diseases.

Methods: Single-centre retrospective study. All patients that underwent US-guided lymph node sampling in our centre from 1st July 2021 to 30th April 2022 were included. The diagnosis, diagnostic yield, specimen adequacy and complication rate are reported. Their associations with the number of passes were assessed using the Fisher's exact test.

Results: Over 9 months, 10 patients underwent US-guided lymph node sampling by an interventional pulmonologist. 70% (7/10) of patients are male and mean age of all patients is 53.6 years. 6 of them underwent 3 passes and 4 of them underwent 4 passes of trucut biopsy with all the specimens yielded adequate results. The number of passes did not vary across characteristics, diagnosis, diagnostic yield, specimen adequacy and complications rates in the patients ($p>0.05$). 40% were diagnosed as metastatic adenocarcinoma of lung, 30% as metastatic squamous cell carcinoma of lung and 20% as Classical Hodgkin Lymphoma and 1 of them diagnosed as small cell carcinoma of lung. There were no complications during and post procedure.

Conclusion: US-guided trucut biopsy performed by an Interventional Pulmonologists are feasible and associated with an excellent result with zero complication rate. It can reduce the number of invasive procedures performed in patients. Guidelines for training is required in future.

Disclosure of funding source(s): none

Abstract #54

Endoscopic intervention combined with bronchial pulmonary embolism in the treatment of severe lung cancer : A case report

Z. Tan^a (Dr), S. Yang^{*a} (Dr)

^a *Department of Pulmonary and Critical Care Medicine, Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences, Guangzhou, China, Guangzhou, CHINE*

A 67-year-old medically free patient presented to our department of respiratory and critical care medicine with cough and hematic sputum for more than 2 months. His medical history was significant for chronic cough, dyspnea with intermittent chest pain and weight loss for 6 months. His vital signs were stable. On chest auscultation, he was noted to have right-sided decreased breath sounds and moist rales. Abdominal examination was unremarkable. Positron emission tomography/computed tomography (PET/CT) scan showed that central lung cancer with multiple lymph nodes, right pleura, and right lung metastases. In addition, it has reported colon cancer. We thought that they were double primary tumors. For lung cancer, TNM stage was cT2bN2M1a, IVA. For clinical symptoms, the Performance Status (PS) score was 3. Bronchoscopy was performed and showed that the lumen of right main bronchus was blocked by neoplasm and covered with white necrotic tissue. Histopathological results of bronchial biopsy showed squamous cell carcinoma. After 3 times of high-frequency electro-surgical ablation via bronchoscope, the right main bronchial lumen, the right middle and lower lobe opening were unobstructed though the right upper lobe opening was blocked by new organisms. Then we performed the first course of chemotherapy with paclitaxel and tislelizumab. One month later, the patient underwent percutaneous bronchial artery embolization. After two courses of chemotherapy with cisplatin, paclitaxel and tislelizumab, the patient underwent percutaneous bronchial artery embolization again. Patient did not have hematemesis or spinal cord injury after embolization. At follow-up, he had complete resolution of his symptoms, including intermittent cough. His PS score was 0. Chest computed tomography (CT) revealed the lesion and metastatic lesion in the right lung were smaller than before. TNM stage was cT3N2MO IIIb. Efficacy assessed as stable disease (SD). So we switched to tislelizumab monotherapy. In this case report, we describe a rare case of severe lung cancer successfully treated with endoscopic intervention and bronchial arterial embolization.

Disclosure of funding source(s): none

Abstract #55

Comparison of the analytical performance of the Oncomine Dx Target Test focusing on bronchoscopic biopsy forceps size in non-small-cell lung cancer.

T. Sakaguchi^a (Dr), Y. Nishii^a (Dr), S. Esumi^a (Dr), M. Esumi^a (Dr), Y. Nakamura^a (Dr), Y. Suzuki^a (Dr), K. Ito^a (Dr), K. Fujiwara^a (Dr), H. Yasui^a (Dr), O. Taguchi^a (Dr), O. Hataji^a (Dr)

^a Matsusaka Municipal Hospital, Matsusaka, JAPON

Background: Next-generation sequencing (NGS) has been implemented in clinical oncology to analyze multiple genes and to guide targeted therapy. Although the pathological diagnosis and biomarker tests for patients with advanced lung cancer have mostly been obtained with small biopsy samples, especially with bronchoscopic approaches, the performance for NGS with respect to the different sizes of biopsy forceps remains little known.

Methods: We retrospectively reviewed consecutive patients with non-small-cell lung cancer, whose FFPE samples were obtained by endobronchial biopsy/transbronchial biopsy and were submitted for the Oncomine Dx Target Test (ODxTT). We compared the analytical performance for ODxTT with respect to the size of biopsy forceps.

Results: A total of 103 samples were identified. The success rate of the ODxTT for the group with all samples obtained with small forceps biopsies (70%) was lower than that of the group with some or all samples obtained with standard forceps biopsies (83%), although without a statistically significant difference ($P=0.20$). As for the reason of unsuccessful analysis, the proportion of the samples which did not pass the nucleic acid concentration threshold in the former group (15%) was higher compared with that of the latter group (4%) ($P=0.08$). The proportion of tissue size 4mm² or larger in the former group (70%) was lower than that in the latter group (93%) ($P=0.01$).

Conclusion: The analysis of ODxTT for specimens biopsied using only small forceps is prone to be unsuccessful due to an insufficient amount of nucleic acid.

Disclosure of funding source(s):

Matsusaka Municipal Hospital received research grant funding from Novartis, GlaxoSmithKline, AstraZeneca, Daiichi Sankyo, Bayer, and Boehringer Ingelheim. K. Ito has received speaker fees as honoraria from Eli Lilly Japan, Chugai, AstraZeneca, MSD, Boehringer Ingelheim Japan, Ono, and Pfizer Japan. O. Taguchi received speaker fees as honoraria from AstraZeneca. O. Hataji received speaker fees as honoraria from Novartis Pharma, AstraZeneca, and Boehringer Ingelheim Japan. The remaining authors declare no conflict of interest.

Abstract #56

Clinical pathway for malignant pleural effusion (MPE): design, implementation process and early clinical outcomes.

I. Matus^a (Dr), V. Krishna Matta^b (Dr), J. Pellenbarg^a (Mme)

^a Thoracic Surgery and Interventional Pulmonology Service, Helen F. Graham Cancer Center and Research Institute, Christiana Care, Newark, De, ÉTATS-UNIS ; ^b Department of Medicine, Christiana Care, Newark, De, ÉTATS-UNIS

Background:

Malignant Pleural Effusion (MPE) impacts the quality of life (QOL) of this patient population with limited life expectancy while carrying a significant healthcare-burden and inpatient mortality rate. The initial diagnostic evaluation and therapeutic management of pleural effusions are commonly shared by various specialty services both in the outpatient, emergency room (ER) and inpatient settings. Non-standardized approaches may lead to fragmented care translating into multiple therapeutic and diagnostic procedures, or their delay. This current approach to the management of MPE may negatively impact patients' QOL, increase time spent in healthcare facilities and costs.

Method:

Clinical pathway created based on survey-identified areas for improvement in the management of malignant pleural effusion at our single 1299 bed institution.

Retrospective comparison as part of an interim report of outcomes between first (N=85) and second (N=87) consecutive cohorts after pathway implementation.

Outcomes include number of ER visits and hospitalizations, average number of pleural interventions per patient, number of specialty services performing interventions and number of emergent interventions avoided.

Results:

ER visits and hospitalizations due to symptomatic MPEs (43 vs. 25, $p=0.03$; 37 vs. 21, $p=0.02$ respectively), average number of pleural procedures per patient (2.19 vs. 2.21, $p=0.47$) and service lines performing procedures (1.14 vs. 1.06, $p= 0.18$) and emergent interventions avoided (29 vs. 43, $p= 0.18$), in the first vs. second consecutive cohorts, respectively.

Conclusion:

Implementation of MPE clinical pathway's centralized care, as experience was gained, offered a reduction of time spent in healthcare facilities and avoidance of emergent interventions, thereby potentially optimizing patients' quality of life.

In addition to these interim findings and upon completion of our ongoing comparison with our pre-pathway control cohort, we hypothesize the pathway's improved access to care will lower cost of care by additionally demonstrating reductions in total number of interventions upon delivering sooner definitive pleural palliative interventions.

Disclosure of funding source(s): none

Abstract #57

Case report - ASPERGILLUS PASSIVE OR AGGRESSIVE?

E. Dumoulin^{*a} (Dr), C. Mody^a (Dr), M. Kelly^a (Dr)

^a *University of Calgary, Calgary, CANADA*

This is a 48 y-o gentleman with a significant list of comorbidities. He started being sick at the age of 46 when he was diagnosed with Philadelphia-negative B-cell ALL. He received a haploidentical brother-brother ABO-incompatible allogeneic transplant. His post bone marrow transplant was complicated by chronic graft-versus-host disease, bronchiolitis obliterans and cryptogenic organizing pneumonia. He developed bilateral cavitory aspergillomas. Endoscopic resection of his right upper lobe aspergilloma resulted in significant improvement of his symptoms including hemoptysis. On biopsy, the walls of the cavity were infiltrated by hyphae consistent with aspergillus, suggesting the fungus being the cause of the cavitory lesion and not the result of colonization. A CT prior to the infection was completely normal with no evidence of scarring or cavitory disease. One month after the procedure, he had a tension pneumothorax with a persistent bronchopleural fistula that required endobronchial valves insertion. After three months, the valves were removed. He received antifungal therapy with voriconazole and then posaconazole. His imaging showed resolution of the cavitory disease in his lungs and the aspergillomas.

This an interesting case where the aspergilloma did not develop in a pre-existing cavity. Endoscopic removal of the fungus ball associated with antifungal treatment resolved both the fungal infection and the cavitory disease.

Disclosure of funding source(s): none

Abstract #58

Evaluation and experience of a newly established national navigational bronchoscopy service in Scotland

F. Millar^a (Dr), S. Giavedoni^a (Dr), J. Mccafferty^a (Dr), A. Marshall^{*a} (Dr)

^a NHS Lothian, Edinburgh, ROYAUME-UNI

Background:

Electromagnetic navigation bronchoscopy (ENB) is an emerging bronchoscopic technique allowing access to peripheral lung lesions not targetable with conventional flexible bronchoscopy. This technique was not previously available in Scotland. We report our initial experience of ENB in a UK teaching hospital servicing patients across Scotland.

Methods:

We evaluated diagnostic performance and safety outcomes from the first 63 cases of ENB from a newly established national ENB service. Lesion demographics were obtained from pre-procedure computed tomography. All procedures were performed on an outpatient basis under conscious sedation using an Olympus 1T bronchoscope and the Medtronic superDimension™ Navigation System. Sampling techniques including biopsy, needle aspiration, endobronchial brushing and endobronchial washing were performed at the discretion of the operator.

Results:

ENB procedures were carried out on patients referred from across Scotland. Two cases were excluded from analysis due to failed registration of the navigation system and unknown final diagnosis. The overall diagnostic rate was 39/61 (63.1%). Of note, five cases designated as false negatives showed evidence of cellular atypia, prompting further intervention in the form of surgical resection or CT guided biopsy. Diagnostic accuracy correlated with lesion size (<30mm 50% vs >30mm 68.75%, $p=0.1778$) and lesion location (middle third 67.9% vs outer third 59.4%, $p=0.5949$), however the use of radial EBUS (rEBUS) did not (without rEBUS 62.5% vs with rEBUS 63.1%, $p>0.9999$). This is likely explained by more challenging case selection when using rEBUS as demonstrated by significantly smaller lesions size (without rEBUS 39.2±14.2mm vs with rEBUS 29.5±13.5mm, $p=0.0081$). The complication rate was low (Pneumothorax 1/63 (1.6%) and moderate bleeding 1/63 (1.6%).

Conclusions:

These data show that we have successfully established an ENB service with a relatively high diagnostic yield and low complication rate. Ongoing experience and learning are expected to lead to further improvements in these parameters.

Disclosure of funding source(s): none

Abstract #59

Bronchoscopy-guided percutaneous tracheostomy in COVID-19 patients

V. Ruiz*^a (Dr), I. Carboni Bisso^a (Dr), F. Rosciani^a (Dr), J. Cantos^a (Dr), M. Las Heras^a (Dr)

^a Hospital Italiano de Buenos Aires, Buenos Aires, ARGENTINE

Objective:

To assess the efficacy and complications associated with performing bronchoscopy-guided percutaneous tracheostomy (PT) in COVID-19 patients.

Methods:

Prospective observational study conducted between march 2020 and february 2022. Adult patients who underwent elective bronchoscopy-guided PT were included. The efficacy of the procedure was evaluated based on the success rate in the execution or the need for conversion to open technique. Also early and late complications observed were recorded.

Results:

During the study period, 312 bronchoscopy-guided percutaneous tracheostomies were analyzed. One hundred and eighty-three were performed in COVID-19 patients and 129 among non-COVID-19 patients. Overall, 64.1% (200) of patients were male, with a median age of 66 (IQR 54 - 74). Sixty-five percent (205) presented at least one comorbidity.

Overall, oxygen desaturation was the main complication observed (20.8% [65]), but it was more frequent in the COVID-19 group occurring in 27.3% (50), with a statistically significant difference vs the non-COVID-19 patients' group (11.6% [15]); $p < 0.01$). Also, major complications such as hypotension, arrhythmias and pneumothorax were more frequently observed among COVID-19 patients but without significant differences.

PT could be executed quickly and satisfactorily in all the patients without the need for conversion to the open technique. Likewise, no suspension of the procedure was required in any case.

Conclusion:

Bronchoscopy-guided PT is an effective and safe procedure in COVID-19 patients. Nevertheless, it is highly remarkable that in our series a great number of COVID-19 patients presented desaturation during the procedure.

Keywords: tracheostomy; bronchoscopy; critical care

[Abbott, Francisco, Marcos Ortega, Sebastian Bravo, Roque Basoalto, and Eduardo Kattan. 2021. "Can We Improve Teaching and Learning of Percutaneous Dilatational Tracheostomy's Bronchoscopic Guidance?" SAGE Open Medicine 9 \(March\): 20503121211002321.](#)

[Freeman, Bradley D. 2017. "Tracheostomy Update: When and How." Critical Care Clinics 33 \(2\): 311-22.](#)

Disclosure of funding source(s): none

Abstract #60

Cost-effectiveness of cone beam CT-guided navigation bronchoscopy

S. Kops^{*a} (M.), R. Verhoeven^a (Dr), R. Vermeulen^a (Mlle), M. Rovers^a (Pr), E. Van Der Heijden^a (Dr), T. Govers^a (Dr)

^a Radboudumc Nijmegen, Nijmegen, PAYS-BAS

Background: Minimal invasive diagnostic procedures of pulmonary nodules have seen significant development in recent years with the advent of navigation bronchoscopy techniques such as cone beam CT-guided navigation bronchoscopy (CBCT-NB). Widespread implementation is however still lacking and CT-guided transthoracic biopsy (TTNB) remains the most utilized diagnostic technique, with high accuracy but also high complication rates (25%). In case of TTNB ineligible patients, treatment without pathologic proof of malignant disease is frequently ensued, risking unnecessary treatment. CBCT-NB can be a valuable alternative but has not been evaluated from a cost-effectiveness standpoint. This model-based study aims to determine if CBCT-NB is a cost-effective procedure in the workup of pulmonary nodules compared to TTNB and direct treatment.

Methods: Two decision analytical models were developed to compare CBCT-NB with TTNB and direct treatment in terms of costs and effects (quality of life). Input data were gathered in-house, from literature, and expert opinion. To assess uncertainty a distribution was modelled around each parameter and sensitivity analyses were performed. The model was run for 5000 iterations while selecting a new input value for each parameter from these distributions for every iteration, resulting in a probabilistic sensitivity analysis (PSA).

Results: CBCT-NB is cost-effective in 73% and 92% of PSA iterations when compared to TTNB, assuming a willingness to pay threshold (WTP) of €20.000 and €80.000. CBCT-NB is cost-effective in 100% of iterations compared to direct treatment at a WTP of €20.000. The minimal required diagnostic accuracy for CBCT-NB to be cost-effective was ~90% vs TTNB and ~65% vs direct treatment. CBCT-NB remained cost-effective compared to direct treatment (without pathology proven disease) until a risk of malignancy >90%.

Conclusions: CBCT-NB can be a cost-effective alternative to TTNB and direct treatment. Direct treatment is seldomly a cost-effective option and a definitive diagnosis before treatment should be pursued if possible.

Disclosure of funding source(s):

Unrestricted research grant by Siemens Healthineers

Abstract #61

Iatrogenic tracheal stenosis: another cause of persistent dyspnea after COVID-19.

A. Marin Muñoz^a (M.), M. Díez Ferrer^a (Dr), P. Trias Sabrià^a (M.), L. Méndez Mangas^a (Mme), M. Plana Pes^a (Mme), F. Rivas Doyague^a (M.), J. Tornero Salto^a (M.), S. Santos Pérez^a (Pr), R. López Lisbona^a (Mme)

^a Hospital Universitari de Bellvitge, IDIBELL, L'Hospitalet De Llobregat, ESPAGNE

Introduction

During the COVID-19 pandemic, the number of patients who required admission to the intensive care unit (ICU) and prolonged intubation (ETI) or a tracheotomy (TT) due to severe ARDS has increased. Causes of persistent dyspnea after severe COVID-19 pneumonia include diffuse lung disease and pulmonary embolism. However, other causes of persistent dyspnea need to be ruled out in COVID-19 ICU survivors, including iatrogenic tracheal stenosis (TS).

Iatrogenic TS account for 50% of the 15-20 patients evaluated every year in the laryngotracheal multidisciplinary team (MDT) of our center. The management of these patients requires an individualized and multidisciplinary assessment, including Interventional Pulmonologists, Thoracic Surgeons and Otolaryngologists.

The objective of this study was to describe the cases of iatrogenic TS after severe pneumonia due to COVID-19.

Material and methods

A descriptive study of the cases of iatrogenic TS in COVID-19 ICU-survivors evaluated at our center's MDT, from the end of the first wave to present.

Results

A total of 10 patients were included, 70% were women, with a median age of 60 years [53.5-64.5]. The median ICU stay was 58.5 days [34-91]. All patients were intubated and 9 of them (90%) required TT, in 2 cases due to extubation failure. Symptoms at diagnosis included dyspnea in 3 (30%), stridor in 6 (60%) and 1 (10%) was asymptomatic. TS location was glottic in 2 (20%) and tracheal in 8 (80%). The main cause of TS was ring fracture secondary to TT (40%).

Conclusions

Iatrogenic TS is a rare cause of dyspnea in COVID-19 ICU-survivors, but it must be considered in these patients given the high number of patients who required prolonged ETI or TT during the COVID-19 pandemic.

Disclosure of funding source(s): none

Abstract #62

Bronchial thermoplasty; its long-term efficacy in severe asthma

P. Wijsman^{*a} (Mlle), A. Goorsenberg^a (Dr), J. D'Hooghe^a (Dr), N. Ten Hacken^b (Dr), E. Weersink^a (Dr), E. Bel^a (Pr), P. Shah^c (Pr), J. Annema^a (Pr), P. Bonta^a (Dr)

^a Amsterdam UMC location University of Amsterdam, Amsterdam, PAYS-BAS ; ^b University Medical Center Groningen, University of Groningen, Groningen, PAYS-BAS ; ^c Royal Brompton Hospital, Department of Pulmonology, London, ROYAUME-UNI

Background Bronchial thermoplasty (BT) is a bronchoscopic treatment for uncontrolled severe asthma patients who remain uncontrolled despite optimal medical therapy. Previously we published the data of the TASMA RCT (Goorsenberg AWM et al. AJRCCM 2021; 203:175-184), which showed clinical benefit 6 months after BT. The aim of this study is to analyse the long-term clinical outcomes of BT.

Methods 22 severe asthma patients of the TASMA trial in the Netherlands were followed for 2,5 years after BT. Main outcome parameters were the Asthma Quality of Life Questionnaire (AQLQ), the Asthma Control Questionnaire (ACQ) and annualized exacerbation rate. Statistical analysis was done by ANOVA for repeated measures and Bonferroni post-test.

Results A repeated measures ANOVA showed that mean AQLQ ($p < 0,001$), ACQ ($p < 0,001$), and exacerbation rate ($p = 0,004$) all differ significantly between time points. Post hoc tests using the Bonferroni correction revealed that after 2,5 years AQLQ improves by an average of 1,1 ($p = 0,003$), ACQ improves by an average of 0.9 ($p = 0,02$) and exacerbation rate reduced with an average of 2,8 ($p = 0,09$).

Conclusion BT results in persistent improvement in quality of life and asthma control and reduction in exacerbation rate. Data of this trial mirror the results on AQLQ, ACQ and exacerbation rate of previous RCTs and large registries. BT should be considered as a valuable treatment for severe asthma with favourable long term outcomes.

Disclosure of funding source(s):

This study was supported by the Netherlands Lung Foundation (Grant number: 5.2.13.064JO), Stichting Astma Bestrijding (SAB): grant nr. 1018/041 and The Netherlands Organization for Health Research and Development (ZonMw grant number: 90713477) and Boston Scientific Corporation.

Abstract #63

The ThinICE protocol: the combination of cryobiopsy and ultrathin bronchoscopy for the peripheral lung nodule.

L. Giuntoli^a (Dr), V. Luzzi^a (Dr), L. Ciani^a (Dr), M. Trigiani^a (Dr), L. Gori^a (Dr), L. Corbetta^a (Pr), R. Piperio^a (Dr), A. Sorano^a (Dr), F. Potenza^b (Dr), S. Ferraro^a (Dr), V. Pasini^a (Dr), C. Ammatuna^a (Dr), F. Lavorini^a (Pr), C. Comin^a (Pr), E. Rosi^a (Dr), S. Tomassetti^a (Pr)

^a Aou-Careggi, Florence, ITALIE ; ^b Aou-Careggi, Firenze, ITALIE

Introduction: Endoscopic sampling of lung lesions is a key moment in the diagnostic process, for both histologic diagnosis and biomolecular profiling of lung lesions. Given the low diagnosis likelihood of current endoscopic techniques, we propose a novel technique using the “ultrathin” 3mm bronchoscope with the 1.1mm cryoprobe as the sampling tool, for lung lesions not directly visible with standard bronchoscope.

Objective: The main aim of the study is to determine the superiority of combined ultrathin and cryobiopsy versus regular bronchoscope and regular forceps biopsy, measured as diagnostic yield. Secondary aim of the study include: Safety and feasibility, adequacy and quality both ROSE and histology evaluation.

Methods: The study is a multi centric, prospective and randomised trial between two groups. One group is assigned to “ultra thin” in which sampling of the lesion is conducted with the ultrathin instrument and the 1.1mm cryoprobe. The second group is assigned to “conventional” in which sampling is obtained using the “standard” 4 or 6mm bronchoscope with endoscopic forceps.

Results: The study has just started only at our centre and is currently ongoing. To date we have enrolled 4 patients in the ultra thin group: in all 4 we were able to endoscopically identify a lesion. In 3 out 4 cases fluoroscopy was needed. In 3 patients we achieved histologic diagnosis via cryobiopsy only, with one case still pending. In all cases ROSE showed a richer cellularity than usually seen with the conventional biopsy using the endoscopic forceps resulting in easier detection of atypical cells. So far no difference were noticed between the groups regarding adverse effect.

Discussion: The use of ultra thin endoscope associated with the use of the 1.1 mm cryoprobe could prove to be a useful tool in the diagnosis of the peripheral lung lesions with or without the use of fluoroscopy.

Disclosure of funding source(s): none

Abstract #64

Cryobiopsy in rare lung tumors: a case and point series

L. Giuntoli^{a*} (Dr), V. Luzzi^a (Dr), L. Ciani^a (Dr), M. Trigiani^a (Dr), L. Corbetta^a (Pr), L. Gori^a (Dr), A. Sorano^a (Dr), F. Potenza^a (Dr), S. Ferraro^a (Dr), V. Pasini^a (Dr), C. Ammatuna^a (Dr), C. Comin^a (Pr), E. Rosi^a (Dr), F. Lavorini^a (Pr), S. Tomassetti^a (Pr)

^a AOU-Careggi, Florence, ITALIE

Introduction: Cryoprobe is a transbronchial biopsy (TBB) tool that yields larger tissue samples than forceps. TBLC has shown promise in several studies in providing meaningful histological information in other rare lung disease, slowly but steadily overcoming the necessities for surgical lung biopsy.

Objective: The purpose of this case series is to show that TBLC opens up unprecedented possibilities in the diagnosis of rare lung tumors, disease that where previously diagnosed only via surgical lung biopsy.

Methods: Here we show 4 clinical cases referred to our center during the past two years for lung nodules suspected for rare malignancies: all underwent TBLC as the first attempt into the histological characterization of such lesions. The first is a 14 y.o. female with no previous condition with a PET positive lung nodules found as part of the work-up for multiple episode of hemoptisys. The histological result was a myofibroblastic tumor. The second is a 30 y.o. female with no previous condition with multiple cystic lesions at chest-CT executed for dyspnea. The histological result was Langerhans cell histiocytosis, with mutation of the BRAF gene, and currently undergoing treatment with deratinib. The third is a 18 y.o female with “congenital encephalopathy” and previous surgical removal of thigh skin melanoma, found as part of the radiological FU. Th histological diagnosis was Pulmonary sclerosing pneumocytoma. The fourth case is a 43 y.o. woman affected by multiple sclerosis, with a peripheral lung lesion. The histological diagnosis was lymphoid hyperplasia

Results: Histologycal diagnosis was achieved in all cases without the need for further procedure. The quality of the samples allowed the necessary genetic and biomarkers studies to be performed. One procedure was complicated by pneumothorax.

Discussion: Rare lung diseases can now be easily diagnosed via cryobiopsy. Cryobiopsy is becoming a valid alternative to SLB for histopathological diagnosis in patients with rare lung tumors.

Disclosure of funding source(s): none

Abstract #65

Clinical outcomes of therapeutic rigid bronchoscopy: 3-year experience of single center

DS. Jeon^a (Dr), HC. Kim^a (Pr), YJ. Jung^a (Pr), CM. Choi^a (Pr), WJ. Ji^{*a} (Pr)

^a Asan Medical Center, Seoul, CORÉE, RÉPUBLIQUE DE

Background: Although the field of interventional pulmonology has grown significantly over the past few decades, the use of rigid bronchoscopy in South Korea is still limited. The aim of this study was to analyze our clinical experience of rigid bronchoscopy for central airway diseases at a single tertiary center during 3 years period.

Methods: We retrospectively reviewed all cases who underwent rigid bronchoscopy from April 2019 to March 2022 at Asan Medical Center in South Korea. All rigid bronchoscopies were performed under general anesthesia in operating room or intensive care unit. Total 83 rigid bronchoscopies were performed on 58 patients.

Results: Among 58 patients, 35 (60.3%) were men, the median age was 59.0 years (IQR, 54.0-66.0 years). The most common etiologies of airway pathologies were malignancy (n=35, 60.3%), after that, TB stenosis (n=9, 15.5%), post lung transplantation stenosis (n=6, 10.3%), and other benign stenosis (n=8, 13.7%). The level of airway obstruction included mainly trachea (n=34, 41.0%), right (n=18, 21.7%) and left (n=18, 21.7%) main bronchus. The average of procedure time was 53.1 minutes (95% confidence interval[CI], 48.0-58.6 minutes). Stent insertion was done in 75 cases (90.4%), stent removal or reposition was done in 6 cases (7.2%), and tumor removal was done in 2 cases (2.4%). Silicone stent was the most frequently used in 71.1% of patients. Successful rate of procedure was 94.0%. Complications occurred in 9 procedures (10.8%), most common complication was bleeding (6.0%); however, there was no fatal complication case.

Conclusions: Therapeutic rigid bronchoscopy is an effective and safe treatment modality for central airway obstruction. We suggest that interventional pulmonologists must consider using a rigid bronchoscope in treating patients with central airway diseases.

Key words: Rigid bronchoscopy, Central airway obstruction, Complication

Disclosure of funding source(s): none

Abstract #66

Transbronchial lung cryobiopsy guided by radial miniature probe EBUS in interstitial lung diseases - Polish experience

M. Gnass^{*a} (Dr), A. Filarecka^a (Dr), J. Soja^b (Pr), A. Ćmiel^c (Pr), A. Bartczak^a (Dr), D. Czyżewski^d (Pr), A. Szlubowski^a (Pr)

^a Pulmonary Hospital in Zakopane, Zakopane, POLOGNE ; ^b Jagiellonian University in Cracow, Cracow, POLOGNE ; ^c Department of Applied Mathematics, AGH University of Science and Technology, Cracow, POLOGNE ; ^d Medical University of Silesia, Katowice, POLOGNE

INTRODUCTION: Transbronchial lung cryobiopsy (TBLC) most often is performed in intubated patient with fluoroscopic control. The histological yield of TBLC reaches 80%. Pneumothorax and bronchial bleeding are the main complications.

OBJECTIVES: In our pulmonology centers intubation and fluoroscopy are not used for TBLC and biopsy site is selected according to lung CT and radial EBUS findings (both opacities and vessels). 5 years after introducing this methodology we examined efficacy and safety profile of this approach. Our hypothesis was that the type of interstitial lung disease (ILD) influences the diagnostic yield of TBLC.

METHODS: A multicenter Polish retrospective study to analyze the influence of cryobiopsy on the final diagnosis and complications in patients with granulomatous and other ILDs was conducted.

RESULTS: 173 patients (M:85,F:88) of mean age (SD) 54.4 (13.5) years underwent TBLC since March 2017 to April 2022. 87 due to suspicion of granulomatous ILD (sarcoidosis, HP, TBC) and 86 due to other ILDs. Sensitivity and accuracy of TBLC in both groups were 93.9%, 94.3% and 64,3%, 65%, respectively and significantly higher for granulomatous ILDs ($p < 0,05$); overall were 78.9% and 79,8%. Pneumothorax occurred in 4.6% in the first and 4.7% in the second group. No severe or moderate bleeding was observed.

CONCLUSIONS: TBLC without intubation and fluoroscopy control guided by radial EBUS miniature probe is safe and has similar yield to other modalities. The type of suspected disease has the biggest impact on biopsy efficacy.

Disclosure of funding source(s): none

Abstract #67

Risk factors and prognosis of airway complications after lung transplantation : A meta-analysis of 39 observational studies

J. Huang^a (Dr), Z. Zheng^a (Dr), J. Lin^a (Dr), Q. Lian^a (Dr), S. Huang^a (Dr), Y. Liu^a (Dr), C. Ju^a (Pr), S. Li^{*a} (Pr)

^a *Guangzhou Institute of Respiratory Health, State Key Laboratory of Respiratory Disease, National Clinical Research Center for Respiratory Disease, National Center for Respiratory Medicine, the First Affiliated Hospital of Guangzhou Medical University, Guangzhou, Guangdong, CHINE*

Abstract

Background: Airway complications (AC) are leading causes of significant morbidity and mortality after lung transplantation, but its predictors and outcomes remain controversial. This study aimed to identify potential risk factors and prognosis of AC after lung transplantation.

Methods: A systematic review was performed by searching PubMed, Embase and Cochrane Library. All observational studies reporting outcome and potential factors of AC after lung transplantation were included. The incidence, mortality and estimated effect of each factors for AC were pooled by using random-effects model.

Results: Thirty-nine eligible studies with 52401 patients undergoing lung transplantation were included for meta-analysis. The pooled incidence of AC was 12.4% (95% confidence interval [CI]: 9.4-15.7) and the most frequent AC is bronchial stenosis (78.3%, 1405/1853). AC-related mortality rates at 30-days, 90-days, 6 months, 1 year and 5 year were 7%, 8.5%, 20.7%, 23.5% and 44.1%, respectively. We also found that AC were associated with worse overall survival in lung transplant recipients (hazard ratio [HR] 1.66, 95%CI 1.05-2.62). Significant predictors of increased risk of AC after lung transplantation included male recipient (odds ratio [OR] 1.59), bilateral lung transplantation (OR 2.08), mechanical ventilation (OR 1.46), cytomegalovirus infection (OR 1.16), acute rejection (OR 1.36), post-operative ICU admission (OR 1.62) and smoking history of donor (OR 1.19). Moreover, diagnosis of cystic fibrosis (OR 0.625, compared to emphysema) and perioperative usage of extracorporeal membrane oxygenation (OR 0.63) were protective factors for AC in lung transplant.

Discussion: Our study indicated that AC after lung transplantation remain common and significantly increased short- and long-term mortality. Several risk factors for AC and have been identified, providing comprehensive evidence for appropriate donor-recipient selection and optimal risk mitigation strategies.

Disclosure of funding source(s): none

Abstract #68

Transbronchial lung cryobiopsy in sarcoidosis - multiple vs single biopsy

M. Gnass^{*a} (Dr), S. Orzechowski^a (Dr), A. Bartczak^a (Dr), D. Czyżewski^b (Pr), A. Ćmiel^c (Pr), J. Soja^d (Pr), A. Szlubowski^a (Pr)

^a Pulmonary Hospital in Zakopane, Zakopane, POLOGNE ; ^b Medical University of Silesia, Katowice, POLOGNE ; ^c Department of Applied Mathematics, AGH University of Science and Technology, Cracow, POLOGNE ; ^d Jagiellonian University in Cracow, Cracow, POLOGNE

INTRODUCTION: Transbronchial lung cryobiopsy (TBLC) is widely used in diagnosing interstitial lung diseases. Two to five biopsies from two different sites should be taken according to the current approach. The main complications of this procedure are pneumothorax and bronchial bleeding. The complication rate is correlated, among others, with number of biopsies.

OBJECTIVES: On the basis of our five years experience in TBLC guided with radial EBUS miniature probe we hypothesized that in patients suspected of stage III sarcoidosis performing single biopsy could be effective enough for histological diagnosis and allow to minimize complications.

METHODS: A multicenter Polish retrospective study to analyze TBLC efficacy and complications in patients with stage III sarcoidosis was performed.

RESULTS: Since March 2017 to January 2022 57 patients (M:32;F:25) of mean age (SD) 46.7 (10.5) years were identified. Multiple biopsy (2-4) was performed in 34 cases and single in 23. Mean (SD) biopsy number was 1.75 (0.74). Sensitivity and accuracy were 96.8% and 97.06% in multiple biopsy group and 95.45% and 95.83% in single biopsy group. The difference between groups was insignificant (P=0.87). Specificity was 100% in both. Location of the biopsy (upper vs middle/lower lobes) and consolidations visible in ultrasound imaging did not influence significantly on the result (P=0.2 and 0.23 respectively). But the tendency for higher yield in upper lobes and with positive ultrasound findings was observed. Pneumothorax was observed in 3 cases, 1 requiring chest tube. No mild or severe bleeding was noticed.

CONCLUSIONS: Taking single biopsy by TBLC with radial EBUS guidance seems to be efficient enough for diagnosing patients suspected of stage III sarcoidosis.

Disclosure of funding source(s): none

Abstract #69

Long-term follow-up of intralobar bullae after endobronchial valve treatment for emphysema

O. Taton^{*a} (Dr), V. Heinen^b (Pr), B. Bondue^a (Pr), DJ. Slebos^c (Pr), P. Shah^d (Pr), K. Carron^e (Dr), O. Moens^a (Dr), D. Leduc^a (Pr)

^a *Hôpital Erasme, Université Libre de Brussels, Brussels, Belgium, Bruxelles, BELGIQUE* ; ^b *Department of Pneumology, Centre Hospitalier Universitaire de Liège, Liège, Belgium, Liege, BELGIQUE* ; ^c *Department of Pulmonary Diseases, University Medical Center Groningen, University of Groningen, Groningen, Groningen, PAYS-BAS* ; ^d *Royal Brompton Hospital, London, London, ROYAUME-UNI* ; ^e *Department of Pneumology, AZ Delta, Menen, Belgium, Menen, BELGIQUE*

Background

Endoscopic lung volume reduction using unidirectional endobronchial valves (EBV) is a new technique in the treatment of patients with severe emphysema. However, the movements of the thoracic structures after endobronchial valves insertion are still unpredictable. We report the unusual outcome of six patients after valves insertion in the left upper lobe (LUL).

Case Reports

These six patients developed septate and isolated bullae in their left lung within 48 hours after EBV insertion in their LUL. All patients fulfilled the key selection criteria for endoscopic lung volume reduction therapy. Careful examination of their chest CT scan performed before valves insertion showed absence of bulla adjacent to the target lobe, paraseptal emphysema, severe scarring, fibrotic lesions and significant pleural adhesions.

All had LUL treatment and the appearance of the bullae occurred concomitantly with a rapid loss of volume of the target lobe complicated by a pneumothorax within two days after EBV insertion.

The outcomes of patients 1, 2 and 3, were uneventful with complete resolution of the bullae. An air-liquid level in the LUL bullae occurred within two days after EBV placement in patients 4, 5 and 6 and was associated with a bacterial infection. A six week antibiotic treatment was given.

Conclusions

Parenchymal or interlobar bulla is a complication after endobronchial valves insertion for endoscopic lung volume reduction in patients with severe emphysema. In case of bulla without an air-liquid level, a conservative attitude should be taken as spontaneous resolution was described, whereas in presence of an air-liquid level in the bulla, antibiotic prophylaxis should be discussed to prevent secondary infection. In both situations, there is a complete resolution of those bullae.

Disclosure of funding source(s):

OT, VH, BB, KC, OM and DL have no conflicts of interest in this work. DJS is a physician-advisor and investigator for Pulmonx, CA, USA. PS received lecture fees and is a consultant of Pulmonx, CA, USA.

Abstract #70

Effect of tracheobronchial foreign body removal using flexible bronchoscopy in adult

H. Kim^a (Dr), JH. Jeong^b (Dr), HJ. Park^c (Dr), CM. Choi^c (Pr), TS. Shim^c (Pr), W. Ji^{*c} (Pr)

^a Division of Pulmonary, Allergy and Critical Care Medicine, Department of Internal Medicine, Hallym University Kangdong Sacred Heart Hospital, Seoul, CORÉE, RÉPUBLIQUE DE ; ^b Division of Pulmonology and Allergy, Department of Internal Medicine, Gyeongsang National University Hospital, Gyeongsang National University School of Medicine, Jinju, CORÉE, RÉPUBLIQUE DE ; ^c Department of Pulmonary and Critical Care Medicine, Asan Medical Center, University of Ulsan College of Medicine, Seoul, CORÉE, RÉPUBLIQUE DE

Background: Although tracheobronchial foreign body (FB) aspiration is life-threatening condition, there are a few studies on the effectiveness of bronchoscopic treatment in adults. The aim of this study was to evaluate the clinical characteristics, outcomes of flexible bronchoscopic FBs removal in adults

Methods: In this retrospective study, we collected medical records of patients diagnosed airway FB aspiration at Asan Medical Center, South Korea, from January 2003 to December 2020.

Results: A total number of enrolled patients who underwent flexible bronchoscopic FB was 68. The median age of the patients was 65 years, 85% was males. All of the patients received flexible bronchoscopy and 94% of patients successfully removed FB (62/66). 4 patients who failed FB removal by flexible bronchoscopy were rescued by rigid bronchoscopy. Neurologic disease with dysphagia was the most common underlying comorbidities (26.5%); artificial teeth and dental device were the most common aspirated FB (38.2%). It showed a tendency to aspirate better into the right (43/68, 63.2%) than the left bronchus (23/68, 33.8%, $p=0.056$). The success rate of FB removal within 4 weeks was higher than those after 4 weeks ($P=0.005$).

Conclusion: Flexible bronchoscopy is useful procedure to remove tracheobronchial FB and bronchoscopic removal delayed more than 4 weeks after aspiration had a high possibility of technical failure. Furthermore, aspiration of FB in tracheobronchial tree appeared to be prevalent in the patients who had neurologic disease or underwent dental procedure.

Disclosure of funding source(s): none

Abstract #71

Association between morphologic classification by medical thoracoscopy and microbiological yield among the patients with TB pleurisy

J. Ryoo^a (Dr), Y. Hong^b (Dr), KH. Kim^b (Pr), JY. Choi^b (Pr), HW. Kim^b (Pr), AY. Shin^b (Pr), JS. Kim^b (Pr), JH. Ahn^b (Pr), JH. Ha^{a,b} (Pr)

^a Bucheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Republic of Korea, Bucheon, CORÉE, RÉPUBLIQUE DE ; ^b Incheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Republic of Korea, Incheon, CORÉE, RÉPUBLIQUE DE

Background: This study aimed to investigate the association between morphologic classification by medical thoracoscopy (MT) and microbiological yield among the patients with TB pleurisy.

Methods: Medical records of patients who underwent MT and were diagnosed as TB pleurisy with microbiological or histologic evidence between 2016 and 2021 at Incheon St. Mary's hospital were retrospectively reviewed. Two respiratory physicians classified all cases into 5 groups by gross findings identified with MT. Diagnostic yield of microbiological test (acid-fast bacilli (AFB) culture or TB-polymerase chain reaction (PCR)) with overall specimens including pre-MT pleural fluid, targeted pleural washing fluid and pleural tissue by each classification was investigated.

Results: A total of 62 patients (15 cases of empyema type, 14 cases of macronodular type mimicking malignancy, 12 cases of pseudomembranous type, 18 cases of micronodular type and 3 cases of minimal lesion type) were enrolled. The proportion of AFB culture positivity was highest among the empyema group (10/15) (66.7%, (95% CI: 38.4%-88.2%)), followed by macronodule group (6/14) (42.9% (17.7%-71.1%)), pseudomembrane group (5/12) (41.7% (15.2%-72.3%)), micronodule group (4/18) (22.2% (6.4%-47.6%)), and minimal lesion group (0/3) (0.0% (0.0%-70.8%)). That of TB-PCR was highest in the empyema group (11/15) (73.3% (44.9%-92.2%)), followed by micronodule group (8/18) (44.4% (21.5%-69.2%)), macronodule group (6/14) (42.9% (17.7%-71.1%)), pseudomembrane group (5/12) (41.7% (15.2%-72.3%)), and minimal lesion group (0/3) (0.0% (0.0%-70.8%)).

Conclusion: With our results, we can hypothesize how TB pleurisy progress - from minimal lesion to micronodules, to macronodules or pseudomembrane and eventually into empyema. Further study is needed to verify our hypothesis.

Disclosure of funding source(s): none

Abstract #72

The treatment of Bronchopleural fistula with tailored metallic occlusion stent

Z. Xie^a (M.), J. Zeng^a (Mlle), M. Ke^{*a} (Dr)

^a Xiamen Medical College Affiliated Second Hospital, Xiamen, CHINE

Background: Bronchopleural fistula (BPF) is an infrequent but life-threatening complication after pulmonary resection. We aimed to explore the feasibility and efficacy of tailored metallic occlusion stent in the treatment of BPF.

Method: We retrospectively reviewed the medical records of the patients who underwent placement of Y-shaped tailored metallic stent between June 2021 and January 2022. A special metallic covered airway stent dedicated for BPF occlusion was designed. The appropriate metallic stent was selected according to the location of fistula and surrounding airway anatomy. One branch of the selected Y-shaped stent was completely closed on-site as occluded branch by suturing and bundling up. The clinical efficacy and complications were analyzed.

Result: A total of 11 patients were included, each patient received one stent. The stents were successfully placed in 10 patients. One failed to complete the placement for excessively large angle at the bifurcation. The follow-up time was ranged from 3 to 10 months. All the 10 patients achieved clinical success. Four patients were cure which defined as complete relief of symptoms, disappearance of pleural residual cavity and the removal of stent for one month; two patients achieved complete remission which defined as complete relief of symptoms, significant shrinkage of residual cavity (>50%) and removal of stent for one month; the other four patients were partial clinical remission, whose symptoms were relieved, residual cavity was shrank (<50%), but stent cannot be removed. The intercostal drainage tube was successfully removed in all patients. The occluded branch sustained well closed during follow-up. The main complications were cough, granulomatous proliferation, mucus retention. No serious complication happened.

Conclusion: Tailoring Y-shaped covered metallic stent on-site is feasible, and the occlusion stent could manage BPF effectively and safely. This innovation might expand the clinical application of metallic stent and provide a new choice for BPF.

Disclosure of funding source(s): none

Abstract #74

Real-world performance of the crown-cut endobronchial ultrasound guided transbronchial aspiration needle

WY. Byun^a (M.), F. Oezkan^b (Dr), C. Loeffler^c (M.), U. Siebolts^d (Dr), L. Diessel^d (Dr), N. Lambrecht^e (Dr), S. Eisenmann^{*e} (Dr)

^a The Ohio State University College of Medicine, Columbus, ÉTATS-UNIS ; ^b University Medicine Essen- Ruhrlandklinik, Department of Interventional Pulmonology, Essen, ALLEMAGNE ; ^c University Hospital Halle, Halle, ALLEMAGNE ; ^d University Hospital Halle, Institute of Pathology, Halle, ALLEMAGNE ; ^e University Hospital Halle, Department of Pulmonology, Halle, ALLEMAGNE

Background: Advancements in personalized medicine have increased the demand for endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) samples that are larger and have preserved tissue architecture. This has led to innovations such as the 3-point crown-cut SonoTip TopGain® (Medi-Globe, Rohrdorf, Germany) needle that contrasts with the standard single-bevel ViziShot 2® (Olympus, Tokyo, Japan) needle. Our objective is to compare the biopsy sample characteristics, diagnostic accuracy, and patient safety between the SonoTip TopGain® and ViziShot 2® needles.

Methods: Twenty patients with enlarged mediastinal and/or hilar lymph nodes requiring EBUS-TBNA for diagnostic workup were enrolled at the University Hospital Halle. The lymph node with the highest probability for malignant infiltration based on size and sonographic appearance was chosen for each patient. Each lymph node was targeted using both the SonoTip TopGain® and ViziShot 2® needles. The samples were then analyzed by a pathologist.

Results: Four patients could not be biopsied with the SonoTip TopGain® needle which could not penetrate cartilage in positions 11L, 11R, and 4L. The mean sample dimension of the SonoTip TopGain® was greater than that of the ViziShot 2® (0.41 cm, $\sigma = 0.24$ cm versus 0.21 cm, $\sigma = 0.096$ cm; $p = 0.007$). The SonoTip TopGain® yielded significantly greater high-power fields compared to the ViziShot 2® (15.88, $\sigma = 13.04$ versus 2.79 $\sigma = 4.13$; $p = 0.005$). There were no significant differences regarding diagnostics and safety.

Conclusion: More tissue can be sampled using the SonoTip TopGain® needle when cartilage penetration can be avoided. Thus, anatomy must be considered to maximize the benefits of the crown-cut needle design. Clinical usefulness of the SonoTip TopGain® needle for different diagnoses and how it compares to other methods such as cryobiopsy are current areas of exploration.

Disclosure of funding source(s): none

Abstract #75

A new NGS panel called lung cancer compact panel detection of KRAS G12D from pulmonary invasive mucinous adenocarcinoma

D. Minami^{1*} (Dr), N. Takigawa² (Pr), Y. Nakajima³ (Dr), N. Miyahara⁴ (Pr), Y. Mizumori⁵ (Dr), M. Ueda⁶ (Dr), S. Nakamura⁷ (M.), F. Suzuki⁸ (M.), Y. Sato⁹ (M.), K. Morikawa¹⁰ (Dr), A. Kanehiro¹¹ (Dr)

¹ Department of Respiratory Medicine, Hosoya Hospital, Ibara City, Okayama, JAPON ; ² Department of Internal Medicine, Kawasaki Medical School, Okayama, JAPON ; ³ Department of Internal Medicine, Himeji Saint Mary's Hospital, Himeji, JAPON ; ⁴ Department of Respiratory Medicine, National Hospital Organization Himeji Medical Center, Himeji, JAPON ; ⁵ Department of Thoracic Surgery, National Hospital Organization Himeji Medical Center, Himeji, JAPON ; ⁶ DNA Chip Research Inc., Tokyo, JAPON ; ⁷ Division of Respiratory Medicine, Department of Internal Medicine, St. Marianna University School of Medicine, Kawasaki, JAPON

Background: Lung cancer compact panel is next-generation sequencing (NGS panels) developed by DNA Chip Research Inc (Tokyo, Japan). The new panel permits sample analysis, including the detection of fusion genes, even when the tumour cell is very low (1%). We report a case with pulmonary invasive mucinous *KRAS G12D*, diagnosed by samples whose tumor cell content was as very low as 2-3%. **Case report:** A 79-year-old woman with findings of abnormal chest shadows in the left lower lobe, who had presented lumbar spinal canal stenosis, and referred to our hospital. Although endobronchial ultrasound-guided transbronchial biopsy with a guide sheath (EBUS-GS) was tried initially, we could not obtain sufficient specimens for pathological diagnosis because of severe cough and pulmonary bulla adjacent to the tumor. Although brushing cytology was categorized as class II (Papanicolaou classification), the solution was subjected to a new NGS panel research called lung cancer compact panel, because of sufficient EBUS view with EBUS-GS. As a result, *KRAS G12D* was detected in the panel research. Therefore, the patient underwent surgery without pathological evidence, and surgical pathology subsequently confirmed the diagnosis of pulmonary invasive mucinous adenocarcinoma. **Conclusion:** As observed, lung cancer compact panel was efficacy for both detection of *KRAS G12D* and diagnosis of pulmonary invasive mucinous adenocarcinoma.

Disclosure of funding source(s): none

Abstract #76

Tranexamic acid versus adrenaline for iatrogenic bleeding during flexible bronchoscopy: a double blind randomized control trial

G. Glodić^a (Dr), I. Sabol^b (Dr), F. Džubur^a (Dr), M. Janković Makeka^a (Dr), D. Baričević^a (Dr), M. Koršić^a (Dr), F. Popović^a (Dr), D. Srdić^a (Dr), M. Samaržija^a (Pr), S. Badovinac^a (Dr)

^a University Hospital Centre Zagreb, Zagreb, CROATIE ; ^b Ruder Bošković Institute, Zagreb, CROATIE

Background: The most commonly used topical hemostatic agents during flexible bronchoscopy (FB) are cold saline and adrenaline. Although widely used for hemostasis in trauma and surgery, data supporting the use of tranexamic acid (TXA) for endobronchial bleeding are limited. Our aim was to compare the efficacy of topical TXA versus adrenaline in controlling iatrogenic bleeding during FB.

Methods: we conducted a cluster-randomized, double blind, single center trial in a tertiary teaching hospital. Following hemostasis failure after 3 applications of cold saline (4°C, 5ml), patients were randomized to receive up to 3 applications of TXA (100mg, 2ml) or adrenaline (0.2mg, 2ml). If bleeding persisted, crossover was allowed (for up to 3 further applications) before proceeding with other interventions. Bleeding severity was graded by the bronchoscopist using a visual analogue scale (VAS; 1 - very mild, 10 - severe).

Results: During the study period 2033 FB were performed with 575 bleeding episodes (mean VAS 3.6±1.3). Bleeding was stopped with cold saline in 432 patients (75.1%). A total of 142 patients were randomized to adrenaline (N=67) or TXA (N=75), and after excluding 12 patients for protocol violation, 130 patients were included in the final analysis. There was no difference in the bleeding control rate between the groups - bleeding was stopped in 83.1% (54/65) and 83.1% (54/65) patients receiving adrenaline or TXA, respectively (p=1). The severity of bleeding and number of applications needed for bleeding control (N) were similar in both groups (adrenaline mean VAS = 4.9 ± 1.3, N=1.8 ± 0.8; TXA mean VAS = 5.3 ± 1.4, N= 1.8 ± 0.8). We recorded no drug related adverse events.

Conclusion: We found no significant difference between adrenaline and TXA for controlling iatrogenic endobronchial bleeding, thus adding to the body of evidence that TXA could be used safely and effectively during FB.

Disclosure of funding source(s): none

Abstract #77

The Utility of Ultrathin cryoprobe with Cone-beam Computed Tomography in Diagnosis of Pulmonary Ground-glass Nodules : A Retrospective Study

Z. Huang^a (Dr), J. Chen^a (Dr), F. Xie^a (Dr), S. Liu^a (M.), Y. Zhou^a (M.), M. Shi^b (Pr), J. Sun^{*a} (Pr)

^a Department of Respiratory Endoscopy, Shanghai Chest Hospital, Shanghai Jiao Tong University, Shanghai, CHINE ;

^b Department of thoracic and cardiovascular surgery, Huashan Hospital, Affiliated with Fudan University, Shanghai, CHINE

Background: Persist ground-glass nodules (GGNs) tend to be malignant. However, it is difficult to localise and acquire GGNs in transbronchial lung biopsy. The purpose of this study is to investigate the efficacy and safety of cryobiopsy (CB) with cone-beam computed tomography (CBCT)

Methods: From August 2020 to November 2021, consecutive patients who underwent different biopsy methods with CBCT were initially enrolled and patients with solid nodules or rebiopsy subsequently were excluded. Demographic data, diagnostic yield, complications, and factors affecting diagnostic yield were recorded.

Results: Total 34 patients with GGNs (consolidation to tumor ratio < 50%) were included. The arrival rate of the endobronchial ultrasound probe under CBCT was 73.5% (25/34). The diagnostic yield of biopsy under CBCT was 50.0% (17/34) and there was statistical significance between total CB and total FB (65.4% vs. 33.3%, $p=0.020$). After excluding reconfirmation failure population, the diagnostic yield was 68.0% (17/25) and there was statistical significance between CB and FB (77.3% vs. 47.4%, $p=0.047$). In univariate analysis, the factors of reconfirmation of CBCT and bronchus sign can affect diagnostic yield of CBCT ($p= 0.016$ and $p= 0.001$, respectively). No pneumothorax or severe hemorrhage was observed in this study.

Conclusions: CBCT combined with an ultrathin cryoprobe is a promising tool for harvesting pulmonary ground-glass nodules.

Disclosure of funding source(s): none

Abstract #78

Coblation in interventional pulmonology for central airway obstruction -an existing concept for newer horizon

G. Lokesh^a (Dr), K. Shyam^b (Dr), G. Uday Kiran^a (Dr), V. Sandeep^a (Dr)

^a Manipal hospitals, Vijayawada, INDE ; ^b birla hospitals, Kolkata, INDE

BACKGROUND

Conventionally we use hot and cold techniques including electrosurgery and Laser and cryotherapy for recanalization of obstructed airway, however Coblation is a radio frequency energy approximately 40 to 70 degree Celsius which allows minimal thermal damage to the tissues, unlike traditional radio frequency techniques like electrocautery which has 400 to 600 degrees Celsius.

CASE SERIES

In this article we present series of 3 cases with central airway obstruction, coblation technique was used for deobstruction in all three cases. First case is 54 year old female with stridor with subglottic mass found out to have metastatic papillary carcinoma of thyroid, second case 23 year old male with history of head injury underwent craniotomy, on tracheostomy for 5 months on evaluation found to have tracheal stenosis above the level of tracheostomy. Third case is of a 70 year old gentleman with subglottic mass, biopsy was suggestive of tracheal amyloidosis. all three cases airway patency was achieved with coblation, on follow up there was no recurrence or scarring.

Conclusion:

Relatively low temperature 40 to 70 degrees Celsius and use of continuous saline irrigation minimises the risk of airway fires and decrease the risk of scarring compared to electrocautery which has higher temperatures (400 degrees to 600 degree Celsius)

Coblation technology with modified wands with 55cm length can be a potential alternative energy in interventional pulmonology for central airway obstruction with its advantages of shorter surgery time and economically lesser cost of the equipment compared to laser technology in resource limited settings

Bibliography:

1. Matt BH, Coffee LA Reducing risk of fire in the operating room using coblation technology Otolaryngology-Head and Neck Surgery (2010) 143, 454-455 doi:10.1016/j.otohns.2010.05.013
2. Doh Young Lee, Young Ju Jin. Application of Coblation Resection in Various Benign Laryngotracheal Diseases, Seoul National University College of Medicine, Seoul, Korea

Disclosure of funding source(s): none

Abstract #79

A case report of pulmonary tuberculosis with metal-induced diffuse lung disease

L. Wang^{*a} (Dr), J. Xia^a (Dr), L. Wang^a (Dr), J. Ye^a (Dr)

^a *Department of Pulmonary Medicine, Affiliated Hangzhou First People's Hospital, Zhejiang University School of Medicine, Hangzhou, CHINE*

Purpose

The purpose of this report is to reveal the value of bronchoscopy in the diagnosis of metal-induced diffuse lung disease complicated with pulmonary tuberculosis.

Methods

A case of pulmonary tuberculosis complicated with metal-induced diffuse lung disease was retrospectively analyzed. The medical history, clinical manifestations, auxiliary examination and diagnosis and treatment process were analyzed. Review relevant literature to summarize the value of bronchoscopy in diagnosis and treatment..

Results

The patient worked as a steel galvanizing and had a smoking history of 10 pack* years. Due to physical examination, chest CT showed diffuse lung lesions, right lung masses, cavities (Fig 1), and multiple nodules. No shortness of breath, fever, cough, chest pain symptoms. Pulmonary function test results: VCmax 99%, FEV1/FVC 83%, MEF75 75%, MEF50 58%, MEF25 36%, MVV 85%, TLCO 87% . Bronchoscopy biopsy showed granulomatous inflammation with necrosis in the right lung and positive staining for acid-fast bacilli (Fig 2A). A biopsy of the left lower lung was positive for Prussian blue staining, confirming the deposition of iron-containing substances in the alveolar space (Fig 2B).

Conclusions

The diagnosis of metal-induced allergic diseases is always dependent on the level of knowledge of the physician. With the help of bronchoscopy, the components of metal that causing allergic alveolitis can be identified, and it is helpful for the diagnosis of coexisting diseases.

Disclosure of funding source(s): none

Abstract #80

Two case of concomitant tuberculosis and lung cancer diagnosed by bronchoscopy

L. Wang^{*a} (Dr), J. Xia^a (Dr), J. Ye^a (Dr), L. Wang^a (Dr)

^a *Department of Pulmonary Medicine, Affiliated Hangzhou First People's Hospital, Zhejiang University School of Medicine, Hangzhou, CHINE*

Purpose:

To explore the diagnostic value of bronchoscopy in pulmonary tuberculosis complicated with lung cancer, as well as the clinical features and treatment progress of pulmonary tuberculosis complicated with lung cancer.

Method:

In the past 1 year, 2 patients with pulmonary tuberculosis complicated with lung cancer diagnosed by bronchoscopy in our department were collected.

result:

Both patients were previously diagnosed with pulmonary tuberculosis and had received regular anti-tuberculosis treatment. CT scan of the chest showed typical imaging findings of tuberculosis. All patients presented with cough without hemoptysis, chest pain, night sweats and fever. Sputum was negative for *Mycobacterium tuberculosis*. The tumor markers in case 1 were NSE 25.76 µg/L and CYFRA21-1 4.95 µg/L; in case 2 the tests were normal. Complete bronchoscopy biopsy, all diagnosed as lung cancer, staging examination confirmed all advanced lung cancer. The bronchoalveolar lavage fluid of case 1 was positive for Xpert. BALF of case 2 was positive for *Mycobacterium tuberculosis* by qPCR.

Conclusion:

Both pulmonary tuberculosis and lung cancer are common diseases of the respiratory system, and patients with pulmonary tuberculosis have a higher risk of developing lung cancer. The clinical manifestations and imaging of the two diseases are similar, which leads to missed diagnosis of lung cancer. Bronchoscopy can reduce the possibility of missed diagnosis and identify the coexistence of the two diseases, which is conducive to treatment and improved prognosis.

Disclosure of funding source(s): none

Abstract #82

Tracheal complications of prolonged mechanical ventilation during the COVID19 pandemic: a single center experience

S. Badovinac^a (Dr), G. Glodić^{*a} (Dr), F. Popović^a (Dr), D. Baričević^a (Dr), M. Samaržija^a (Pr)

^a *University Hospital Centre Zagreb, Zagreb, CROATIE*

Background: Tracheal complications of mechanical ventilation (MV) include postintubation (PITS) and post tracheostomy (PTTS) tracheal stenosis and tracheoesophageal (TE) fistulas. Risk factors for these complications include prolonged MV, reintubation and poor endotracheal tube cuff management, all of which were common in severe COVID19 patients during the pandemic.

Methods: we conducted a retrospective review of all patients referred to our bronchoscopy unit for endoscopic evaluation of PITS, PTTS or TE fistulas complicating MV for COVID19 from March 2021 to March 2022.

Results: A total of 21 of patients were evaluated during the study period with a mean age of 60.3 years. The median duration of MV was 14 (9.75-19.5) days. Reintubation after MV weaning and tracheostomy were required in 14.3% and 38.1% of patients, respectively. Patients presented with stridor (71.4%), dyspnea (38.1%) or aspiration (4.7%) after a median of 42 (19.5-60) days after extubation with a further delay of 15 (3-42) days until final diagnosis. Simple PITS was found in 62% of cases with a mean diameter of 5.54 ± 1.6 mm, complicated PITS in 28.6% and TE fistulas in 9.4% of patients. Thirteen (62%) patients were successfully treated endoscopically with serial dilatation and electrocautery. Restenosis after treatment was observed in 76.9 % of patients after a median of 30 (22.5-49) days. Six patients required upfront surgery while three patients required further endoscopic dilatation after surgery. Interestingly, 18 of the 21 patients were referred from a single hospital, after treatment in the same ICU.

Conclusions: We experienced an increase in referrals to our bronchoscopy unit at a tertiary teaching hospital during the study period with a cluster of patients from a single ICU. The high rate of restenosis emphasizes the importance of multidisciplinary management as well as the prevention of tracheal complications with high quality ICU care during the COVID19 pandemic.

Disclosure of funding source(s): none

Abstract #83

Impact of remote pulmonology case observations on cost and time expenditures for providers

B. Benn^a (Dr), J. Kurman^a (Dr)

^a *Medical College of Wisconsin, Milwaukee, ÉTATS-UNIS*

Background

Given the wide-reaching impact of physician shortages, clinician burnout, and a global health crisis, the need to broadly disseminate specialized knowledge is essential to deliver effective, global interventional pulmonology care. This demand is compounded as novel, quickly evolving pulmonology technologies come to market. This analysis evaluates the role of remote case observation in untethering physicians and clinical teams from traditional scheduling constraints, limited provider access, and travel burdens when introducing a new medical technology within a health system.

Methods

We performed a retrospective analysis following the launch of a peripheral lung navigation platform, Illumisite (Medtronic, Minneapolis, MN, USA), which employed the Explorer Surgical (Global Healthcare Exchange, Louisville, CO, USA) digital case management platform to remotely broadcast procedures and enable collaboration among physicians. We collected data on 10 remote case observations from April through November 2021 and analyzed its impact on travel costs and time away from practice.

Results

18 individual physicians remotely observed 10 Illumisite procedures. U.S. cost estimates were \$2,000 per case observer, including airfare, lodging, transportation, and meals, and an average of 72 hours away from a visiting physician's practice. Estimated cost savings were \$36,000, and time savings were 1,296 hours (54 days away from a provider's practice).

Conclusion

Our analysis demonstrates that remote interactive case observation offers a unique opportunity to increase access to procedural expertise, while saving money and time for observing physicians. Time gained by providers avoiding travel may lead to additional patients treated and procedures performed at their institutions. The cost savings allow for additional investments in procedural training and product innovation. This technology has the potential to create a paradigm shift in medical education and procedural training. The applications of this analysis are global in nature, setting the stage for additional research in interventional pulmonology and across other specialties.

Disclosure of funding source(s): none

Abstract #84

High diagnostic yield of electromagnetic navigation bronchoscopy performed under cone beam CT guidance: results of a randomized Belgian monocentric study.

B. Bondue^{*a} (Pr), O. Taton^a (Dr), F. Tannouri^a (Dr), N. Van De Velde^a (Dr), M. Remmelink^a (Pr), D. Leduc^a (Pr)

^a CUB Hôpital Erasme, université libre de Bruxelles, Brussels, BELGIQUE

Background. With the increasing use of low dose CT scans, numerous pulmonary nodules are detected. As a majority of them is benign, development of efficient non-surgical diagnostic intervention is mandatory. Electromagnetic navigation bronchoscopy (ENB) has been developed to reach difficult to access lesions. The aim of the present study was to compare the diagnostic yield of ENB procedures performed in a classical endoscopy suite or in a hybrid room equipped by a cone beam CT (CBCT).

Methods. A monocentric randomized study was performed in the Erasme Hospital between January 2020 and December 2021. Lung nodules of maximum 30 mm of diameter were eligible. In both arms (endoscopy or CBCT suites), ENB, fluoroscopic guidance and a radial endobronchial ultrasound were used to reach the lesion. Then six trans-bronchial biopsies (TBB) and one trans-bronchial lung cryobiopsy (TBLC) were performed.

Results. 49 patients were randomized (24 in the endoscopy and 25 in the CBCT arms). The lesion size was $15,9 \pm 4,6$ mm and $16,6 \pm 6,0$ mm respectively (mean \pm SD, p=NS). The diagnostic yield of ENB performed under CBCT guidance was 80% compared to 42% when performed in the endoscopy suite under standard fluoroscopic guidance (p<0,05). Duration of the procedure in the CBCT and endoscopy arms was 80 ± 23 and 61 ± 13 minutes respectively (mean \pm SD, p<0,01). Performing TBLC in addition to TBB increased the diagnostic yield of 16% (17% and 12,5% in CBCT and endoscopy suites respectively, p=NS).

Conclusion. This study highlighted the additional value to perform ENB procedure under CBCT guidance for less than 2 cm of diameter pulmonary nodules.

Clinical trial registration number: NCT05257382

Disclosure of funding source(s):

This study was supported by the Fonds Erasme (financial support to purchase ENB catheters and platform).

Abstract #85

Feasibility, safety and tolerability of thermal ablation in COPD patients with peripheral malignant pulmonary nodules

L. Yang^{*a} (Pr), Y. Hu^b (Dr), M. Ao^a (Dr)

^a Department of Respiratory and Critical Care Medicine, The First Affiliated Hospital of Chongqing Medical University, Chongqing, CHINE ; ^b Department of Emergency and Critical Care Medicine, The First Affiliated Hospital of Chongqing Medical University, Chongqing, CHINE

Background Currently, the feasibility, safety and tolerability of thermal ablation for COPD patients with peripheral malignant pulmonary nodules have not been reported.

Methods We prospectively collected the data from consecutive inoperable inpatient with highly suspected or confirmed malignant peripheral pulmonary nodules who underwent CT-guided therapeutic thermal ablation in our hospital from January 1st, 2019 to May 31th, 2022. They were divided into COPD group and non-COPD group. Depending on whether the patient was diagnosed with malignant pulmonary nodules at baseline, thermal ablation directly alone or simultaneous percutaneous lung biopsy and thermal ablation were performed, respectively. The incidence, severity and risk factors of complications, changes in MMRC score, discharge time and hospitalization expenses in two groups were compared.

Results 194 patients were prospectively enrolled in this study with 67 in the COPD group and 127 in the non-COPD group. The total incidence of pneumothorax after procedures was significantly higher in the COPD group (32.84%) than in the non-COPD group (15.75%, $p < 0.05$), but the severity of pneumothorax was mainly mild and there was no significant difference in treatment for pneumothorax ($p > 0.05$). COPD and / or pulmonary bullae was an independent high-risk factor for pneumothorax after procedures (OR=3.742, $p < 0.05$). The incidence of pneumothorax between I-II(30.77%) with III-IV(60%) or A-B(30.77%) with C-D(60%) degree lung function did not reach the significant difference ($p > 0.05$). In the COPD group, the MMRC score was significantly increased at post-procedures than at the baseline ($p < 0.05$), but there was no significant difference in discharge time after procedures and hospitalization expenses between patients with or without pneumothorax ($p > 0.05$).

Conclusions Although the incidence of pneumothorax and AECOPD after CT-guided thermal ablation was increased in inoperable high-risk COPD patients with peripheral malignant pulmonary nodules, there was no significant difference in treatment and economic burden, and it is feasible, safe, and well tolerated.

Disclosure of funding source(s):

Chongqing Science and Technology Commission, Chongqing People's Municipal Government (cstc2019jscx-msxmX0184), Discipline Innovation Fund of discipline Cultivation project from the First Affiliated Hospital of Chongqing Medical University (XKST134) and Program for Youth Innovation in Future Medicine, Chongqing Medical University supported for the conduct of the study and had no such involvement.

Abstract #86

Risk of bleeding associated with transbronchial biopsy using flexible bronchoscopy in patients with suspected pulmonary hypertension

Y. Takashima^{*a} (Dr), N. Shinagawa^a (Pr), D. Morinaga^a (Dr), J. Nakamura^a (Dr), M. Furuta^a (Dr), T. Shoji^a (Dr), H. Asahina^a (Dr), E. Kikuchi^a (Dr), J. Kikuchi^a (Dr), J. Sakakibara-Konishi^a (Dr), I. Tsujino^a (Pr), S. Konno^a (Pr)

^a *Department of Respiratory Medicine, Faculty of Medicine, Hokkaido University, Sapporo, JAPON*

Background: The safety of endobronchial ultrasound-guided transbronchial biopsy (EBUS-TBB) in patients with a finding of pulmonary hypertension (PH) is controversial. Little is known about the relationship between the risk of bleeding associated with EBUS-TBB in the presence of PH suspected on echocardiography or chest CT.

Methods: To assess the risk of bleeding associated with EBUS-TBB in patients with presumed PH per echocardiography or chest CT, we retrospectively reviewed the medical records of 314 consecutive patients who underwent EBUS-TBB using a guide sheath (GS), as well as echocardiography and chest CT. A bleeding complication was defined as over one minute of suctioning; repeated wedging of the bronchoscope; instillation of cold saline, diluted vasoactive substances, or thrombin due to persistent bleeding. PH was defined as peak tricuspid regurgitation velocity (TRV) > 2.8 m/s on echocardiography or pulmonary artery to aorta ratio (PA:A ratio) > 0.9 on chest CT.

Results: In total, 35 (11.1%) patients developed bleeding and all cases were managed safely. Furthermore, 17 (5.4%) and 59 (18.8%) patients were suspected to have PH based on echocardiography and chest CT, respectively. Of the patients suspected to have PH on echocardiography, 5 (5/17=29.4%) patients developed bleeding. Of the patients suspected to have PH on chest CT, 11 (11/59=18.6%) patients developed bleeding. Univariate analysis revealed that long diameter (≥ 30 mm) of the lesion, lesion location (biopsy site was inner side than segmental bronchus), bronchoscopic diagnosis of malignancy, and additional biopsy were potential predictive factors of bleeding. The finding of PH on echocardiography correlated significantly with bleeding ($p = 0.03$). On multivariate analysis, long diameter of the lesion ($p = .021$) and finding of PH on echocardiography ($p = .049$) were significantly associated with bleeding.

Conclusion: PH suspected based on echocardiography may be a risk factor of significant but manageable bleeding associated with EBUS-TBB using a GS.

Disclosure of funding source(s): none

Abstract #87

The Effectiveness And Safety Of Zephyr Endobronchial Valve For The Treatment Of Heterogeneous Emphysema In China : A Multi-center Randomized Controlled Clinical Trial

X. Xie^{a*} (Pr), X. Li^a (Pr), X. Li^a (Pr), Y. Huang^b (Pr), Q. Feng^c (Pr), X. Wang^a (Pr), J. Luo^a (Pr), C. Wei^a (Mme), J. Liu^a (Mme)

^a The First People's Hospital of Neijiang, Neijiang, CHINE ; ^b Chongqing People's Hospital, Chongqing, CHINE ; ^c Integrated traditional Chinese and Western Medicine Hospital of Southern Medical University, Guangzhou, CHINE

Objective: To assess the efficacy and safety of Zephyr valve Endobronchial Valve (EBV) for treating Chinese patients with severe heterogeneous emphysema without collateral ventilation.

Methods: This prospective, multi-center, randomized controlled clinical trial enrolled patients from 3 sites from April 2017 to April 2020. Subjects were randomized into an EBV group and Standard-of-Care (SoC) group. The subjects from the SoC group received Standard-of-Care and were discharged after post-bronchoscopy; those with EBV underwent placement of Zephyr EBV valves during the same session. The primary outcome was the percentage of subjects who showed improvement in the post-bronchodilator (post-BD) FEV1 of $\geq 15\%$ at 1-year follow-up. Secondary endpoints were: the difference between an absolute change in FEV1, Six-Minute Walk Distance (6MWD), St. George's Respiratory Questionnaire (SGRQ), Chronic Obstructive Pulmonary Disease Assessment Test (CAT), Modified Medical Research Council Dyspnea Scale (mMRC) at 12-months.

Results: A total of 60 subjects (20 EBV, and 40 SoC) were included. At 12-months, 55% EBV and 25% SoC subjects had a $\Delta FEV1 \geq 15\%$ ($p < 0.001$). with a between-group absolute difference of 30.0, RR:2.2 [95% CI: 22.84% to 57.16%; $p < 0.001$; Intention-to-Treat], from baseline to 12-months follow-up difference in FEV1 (0.249L, [95% CI: 0.200 to 0.298]), 6MWD (+154.640meters, [95% CI: 120.463 to 188.817]), mMRC (-0.75 points, [95% CI: -0.287 to -1.213]), SGRQ (-14.125 points, [95% CI: -13.076 to -15.174]), CAT (-9.10 points, [95% CI: -8.24 to -11.35])(all $p < 0.05$)

Conclusions: Compared to Standard-of-Care (SoC), Zephyr valve EBV can improve lung function, dyspnea, quality of life, and exercise capacity for at least 1-year in COPD patients without collateral ventilation.

References:

1. Low SW, Lee JZ, Desai H, Hsu CH, Sam AR, Knepler JL. Endobronchial Valves Therapy for Advanced Emphysema: A Meta-Analysis of Randomized Trials. *J Bronchology Interv Pulmonol.* 2019;26(2):81-89.

Disclosure of funding source(s):

This work was supported by the Key Support Project of Sichuan Provincial Health Commission[17ZD003].

Abstract #88

Utility of endobronchial sonographic mediastinal nodal patterns for prediction and correlation with final diagnosis: Indian experience

S. Goyal^{*a} (Dr), U. Parakh^b (Dr), B. Bhalhotra^b (Pr), N. Jain^b (Dr)

^a Artemis Hospitals, Gurugram, INDE ; ^b Sir Ganga Ram Hospital, New Delhi, INDE

Background:

Sonographic features of mediastinal nodes on convex probe endobronchial ultrasound (CP-EBUS) can be used for prediction of various pathologies. Studies to define benign vs. malignant; further sub grouping benign pathologies at a tuberculous endemic country are very few. Our work utilizes large sample size to assess utility of CP-EBUS patterns to aid the operator to predict, sample the most suspicious node and correlate with final diagnosis.

Methods:

Four hundred sixty nine patients (n=469) who underwent CP-EBUS over a period of 24 months at a tertiary care medical center were retrospectively studied. Lymph nodal EBUS patterns such as size, shape, margins, echogenicity, central hilar structure (CHS) and central necrosis sign (CNS) were recorded, compared and correlated with final diagnosis.

Results:

Out of total cases (n=469); malignancy confirmed in (n=68), 44 came out inconclusive and rest turned out benign (n=357) specifically sarcoidosis (n=129), tuberculosis (n=183), reactive (n=36) and others (n=9). Round shape had high sensitivity and absence of CHS has a high positive predictive value for malignant nodes ($p<0.04$). Presence of CNS had low accuracy for prediction of malignancy among Indian population in contrast to other studies. Tuberculosis showed significant presence of CNS (34.9% vs. 2.3%; $p<0.001$) and heterogenous echotexture (62.3% vs. 17.8%; $p<0.01$) in contrast to sarcoidosis.

Conclusion:

Presence of central hilar structure was suggestive of benign disease specifically reactive nodes. Central necrosis and heterogeneity were found highly specific for tuberculosis over sarcoidosis. EBUS patterns to suggest malignancy have low specificity in a tuberculous endemic country but are useful to predict benign pathology and further sub grouping of benign diseases.

Disclosure of funding source(s): none

Abstract #89

Global research trends in pediatric bronchoscopy: A bibliometric analysis

H. Cheng^a (Pr), Y. Li^a (Pr), S. Hu^a (Mlle), H. Qiao^a (Pr), F. Meng^{a*} (Pr)

^a Pediatric department, The first hospital of Jilin University, Changchun, CHINE

Keywords: pediatricbronchoscopy; research trends; hotspots; bibliometric analysis

Background: Pediatric bronchoscopy has been widely applied in the diagnosis and treatment of pulmonary related diseases during recent two decades. This study aimed to explore the current status and hotspots of pediatric bronchoscopy by bibliometric analysis.

Methods: The Web of Science core collection database was retrieved for articles on pediatric bronchoscopy. The screened period ranged from the creation of the database to April 28, 2022. The original articles written in English were selected to obtain data. Microsoft Excel, Endnote and VOSviewer were used to analyze the data.

Results: There were 675 original articles with a total citation frequency of 14169. The first related article was published in 2003, then the number of published articles was increasing gradually and reached 78 in 2021. The United States of America (USA) and China were the top two countries with the most articles. They contributed 42.51% articles. The top one institution with the most articles was University of Pennsylvania. *Pediatric Pulmonology* published the most articles (110 articles). The most productive authors contributed 14 articles respectively, and they were Cakir Erkan, from Bezmialem Vakif University in Turkey and Goussard Pierre, from Stellenbosch University in South Africa. By cluster analysis, the keywords were divided into six clusters: trachea malformations, pneumonia and asthma diseases, trachea-esophageal malformations, foreign body, sedation, and risk assessment. The sedation cluster appearance time was the latest one (2014.08±0.57). The most occurrence keywords were management (128), bodies (177), diagnosis (93), complication (82), and bronchoalveolar lavage (75).

Conclusion: Pediatric bronchoscopy draw attention of the worldwide pediatricians, and the number of related articles gradually increased. The USA and China played the leading roles in the research. The hotspots focused on the trachea and esophageal malformation, pneumonia and asthma diseases, foreign body, sedation, and risk assessment.

Disclosure of funding source(s):

Natural Science Foundation of Jilin Province(20200201464JC)

Education Department Scientific Research Project of Jilin Province (JJKH20221077KJ)

Abstract #90

Endobronchial-ultrasound Needle Aspiration Combing With Endoscopic Ultrasound-fine-needle Aspiration In Lymphoma Diagnosis And Subtype Classification

L. Zhang^a (Dr), S. He^a (Dr), YM. Zhang^a (Dr), L. Wang^b (Dr), GQ. Wang^{*a} (Dr)

^a National Cancer Center/National Clinical Research Center for Cancer/Cancer Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing, CHINE ; ^b National Cancer Center/National Clinical Research Center for Cancer/Cancer Hospital & Shenzhen Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Shenzhen, CHINE

Background

EBUS-TBNA and EUS-FNA are efficient and safe approaches in the assessment of undefined deep-seated lesions, especially in neoplasm. However, the application of EBUS-TBNA and EUS-FNA in lymphoma diagnosis remains undetermined and unrecognized. In this study, we evaluate the role of EBUS-TBNA combing with EUS-FNA in lymphoma diagnosis and subtype classification.

Methods

We retrieved the database of all patients undergoing EBUS-TBNA or EUS-FNA in the department of Endoscopy, National Cancer Center/Cancer Hospital from January 2008 to June 2021 and identified patients with suspected or diagnosed lymphoma. A retrospective analysis was performed, and clinical data were carefully studied.

Results

A total of 4,121 patients underwent endoscopic ultrasound-guided puncture, including 2,501 cases of EBUS-TBNA and 1,620 cases of EUS-FNA. Among these patients, 192 were suspected of lymphoma, therefore 123 underwent EBUS-TBNA and 69 underwent EUS-FNA. Consequently, 51 patients (26.56%) were diagnosed with lymphoma, including 29 patients diagnosed by EBUS-TBNA and 22 patients by EUS-FNA. The overall sensitivity of ultrasound-guided endoscopic puncture for lymphoma diagnosis was 62.75%. The sensitivity of EUS-FNA (72.73%) was likely higher than those of EBUS-TBNA (55.17%), but the difference was not statistically significant ($p = 0.199$). The negative predictive values of EBUS-TBNA and EUS-FNA were 87.85% and 88.68% ($P=0.879$), respectively. The specificity rates and positive predictive values of both groups were 100%. Among 29 new-onset cases, 20 (68.97%) were classified as lymphoma subtypes. Thirteen cases were initially diagnosed by EBUS-TBNA, of which 10 (76.92%) were specifically classified. In addition, 16 lymphoma cases were initially diagnosed by EUS-FNA, of which 10 (62.5%) were classified. One patient experienced fever after EUS-FNA was cured by conservative method.

Conclusion

EBUS-TBNA combing with EUS-FNA is an effective, minimally invasive diagnostic method for patients with suspected lymphoma. These two approaches are similar in lymphoma diagnosis and valuable in classifying lymphoma subtypes.

Disclosure of funding source(s):

This work was supported by Sanming Project of Medicine in Shenzhen [grant number SZSM201911008].

Abstract #91

Multicenter Clinical Study of Transbronchial RFA in peripheral lung cancer: An interim analysis of 3-month Follow-up

Z. Changhao^a (Dr), S. Jiayuan^b (Pr), C. Difei^a (M.), S. Zhuquan^a (Dr), C. Siguo^c (Pr), W. Feng^d (Pr), W. Xiaoping^e (Pr), L. Guangnan^f (Pr), Z. Xiaojun^g (Pr), L. Fengming^h (Pr), Z. Nanⁱ (Pr), W. Hongwu^j (Pr), J. Longyu^k (Pr), L. Fa^l (Pr), L. Chunfang^m (Pr), W. Shimanⁿ (Pr), G. Qing^o (Pr), W. Xiang^p (Pr), T. Chunli^a (Dr), L. Shiyue^a (Pr)

^a The First Affiliated Hospital of Guangzhou Medical University, National Clinical Research Center for Respiratory, Guangzhou Institute of Respiratory Disease., Guangzhou, CHINE ; ^b Shanghai Chest Hospital, Shanghai, CHINE ; ^c Sir Run Run Shaw Hospital, College of Medicine, Zhejiang University, Hangzhou, CHINE ; ^d Affiliated Beijing Chaoyang Hospital of Capital Medical University, Beijing, CHINE ; ^e Shandong Provincial Chest Hospital, Ji-Nan, CHINE ; ^f The Second Affiliated Hospital of Guangxi Medical University, Nanning, CHINE ; ^g Henan Province People Hospital, Zhengzhou, CHINE ; ^h West China Hospital of Sichuan University, Chengdu, CHINE ; ⁱ Emergency General Hospital, Beijing, CHINE ; ^j Dongzhimen Hospital, Beijing University of Chinese Medicine, Beijing, CHINE ; ^k The Third Xiangya Hospital of Central South University, Changsha, CHINE ; ^l Shenzhen Hospital, University of Chinese Academy of Science, Shenzhen, CHINE ; ^m DaLian Municipal Central Hospital, Dalian, CHINE ; ⁿ The first hospital of Shanxi Medical University, Taiyuan, CHINE ; ^o Renmin Hospital of Wuhan University, Wuhan, CHINE ; ^p The Second Xiangya Hospital of Central South University, Changsha, CHINE

Background: Given the demonstrated good ablation effects of percutaneous radiofrequency ablation(RFA) and the hypothesis endobronchial approaches have a lower complication rates than transthoracic techniques, with the development of bronchoscopy navigation, transbronchial RFA was preliminary considered as an novel interventional treatment for inoperable lung cancer. But there is no comprehensive and systematic evidence to confirm its clinical efficacy and safety.

Method: This is a multicenter study of transbronchial RFA on peripheral lung tumor. A 3-month interim analysis of patients characteristic, RFA technique performance, and safety are described.

Result: Enrollment of 126 subjects from 16 clinical centers has completed 3-month follow-up, 54 subjects were female, and the median age was 67.5 (range:23-85). The mean tumour size(mean±SD) was 18.59mm±5.86 (range:5.22mm-29.58mm). COPD(16/126, 12.70%) and emphysema (8/126, 6.35%) represented the most predominant thoracic comorbidities. Bronchoscopic navigation was conducted in all procedure, with the assistance of fluoroscopy (86.51%, 109/126) , radical-EBUS (91.27%, 115/126), and other assist device. All the operations were uneventful with average ablation range of 31.34±11.45mm and median operative time of 81minutes. In terms of safety profiles, a total of 66 patients (66/126, 51.59%) had 194 adverse events according to 3-month follow-up. Incidence of hemoptysis was 6.35% (8/126), 7.94%(10/126) of pleural effusion, and 3.97%(5/126) of pneumothorax. 15 patients complained chest pain(15/126, 11.90%), and 5 patients had fever(5/126, 3.97%). 9 patients (9/126, 7.14%) developed with 13 serious adverse events in 3-month follow-up. All patients but one improved after systemic treatment. This patient dead due to pulmonary infection in 1 week after RFA procedure. Age >70 years and range of ablation were figured as independent risk factors for SAE by multivariate logistic regression analysis.

Conclusion: 3-month result of 126 subjects enrolled preliminary demonstrate satisfied technique performance and safety of transbronchial RFA procedure. Continued follow-up are required to further evaluate its efficacy and safety.

Disclosure of funding source(s): none

Abstract #92

Failure of Pleural Biopsy with the Hybrid Knife: A Case Report

YH. Zhang^{*a} (Pr)

^a *The First People's Hospital of Yunnan Province, Kunming, CHINE*

Background : If fibrotic pleuras were encountered, the standard flexible forceps (SFF) may limit biopsies because the SFF lacks mechanical strength to obtain sufficient pleural specimens. All of the limitations may be overcome, theoretically, by using a Hybrid Knife with a high-pressure water jet. However, we failed to perform pleural biopsy in a patient with the Hybrid Knife.

Case Report: A 67-year-old man admitted to our hospital presented with a cough and shortness of breath of a 3-month duration. The chest computed tomography scan showed a massive pleural effusion in the right chest cavity. Pleural fluid analysis revealed a yellowish exudate. Semi-rigid thoracoscopy was performed under local anesthesia. Whitish slightly thickened parietal pleural lesions without nodules were observed, and the surface was smooth. Because we could not obtain specimens from the pleural lesions using an SFF for about 3 minutes, we used the Hybrid Knife (T-type) to perform dissection of pleural lesions. A water jet to inject a solution of 0.9% sodium chloride and methylthioninium chloride into the parietal pleura with 30 cm H₂O of water jet pressure. The performance failed although we tried several times. We used the SFF for pleural biopsy again and tried many times. After about 20 minutes, we obtained a piece of pleura (3×2mm) finally. The pathological diagnosis was metastatic lung adenocarcinoma. Because we suspected that there was something wrong with this Hybrid Knife, we conducted an animal experiment with healthy pig lungs, which confirmed that it was normal.

Conclusion: Although medical thoracoscopic biopsy with an Hybrid Knife is a convenient and effective technique, it is not always effective when hard fibrothorax is encountered.

Disclosure of funding source(s): none

Abstract #94

Clinical application of balloon dilatation-guided combined perforation placement difficult Y-shaped silicone stent in the treatment of malignant complex tracheal stenosis

B. Cuixia*^a (Pr), Z. Jinhua^a (Pr)

^a *Jining No.1 People's Hospital, Jining Shandong, CHINE*

Abstract: Objective To investigate the efficacy and safety of balloon dilation guided drilling combined with Y silicone stent in the treatment of malignant complex airway stenosis. **Methods** In the process of Y-shaped silicone stent implantation for malignant complex airway stenosis, 8 patients with difficult stent implantation were treated with balloon dilatation-guided combined puncture technique. Observe Y silicone stent placement success rate, the time required, difficulty breathing ease the situation, intraoperative and postoperative complications such as index. **Results** The y-shaped silicone stent was successfully implanted in all 8 patients with malignant complex airway stenosis by balloon dilatation-guided combined with perforation technology. Postoperative dyspnea was significantly relieved, and no complications occurred during or after surgery, and no operation-related deaths occurred. **Conclusion** Balloon dilatation-guided combined perforation technology can successfully implant Y-shaped silicone stent, which can be used as the optimal solution to solve the difficulty of implant Y-shaped silicone stent.

Keywords : Rigid bronchoscopy;Bronchoscopy; Balloon ; Perforation ; Y-shaped silicone stent ; Tracheal stenosis

Disclosure of funding source(s): none

Abstract #95

Novel minimally invasive technique for whole lung lavage

F. Frangopoulos^a (Dr), I. Porfyrides^a (Dr), A. Granitsas^a (Dr), S. Sofokleous^a (Dr), I. Zervou^a (Dr), Y. Damianou^a (Mme), K. Demetriadou^a (Mme), T. Adamide^a (Dr)

^a Nicosia General Hospital, Nicosia, CHYPRE

Background

Pulmonary Alveolar Proteinosis (PAP) is characterized by alveolar accumulation of surfactant. Whole lung lavage (WLL) is the standard treatment but there are no guidelines standardizing the procedure.

Case Report

A 29-year-old female diagnosed with autoimmune PAP was referred to our clinic due to progressive respiratory failure for WLL. At presentation she was hypoxic requiring 10 lpm supplemental oxygen. After informed consent the patient was intubated supine with a single lumen endotracheal tube. Each segmental lobe of the left lung was sequentially blocked with a bronchoscope connected to a sterile single use Pulse Lavage device. The Pulse Lavage can administer steady pressurized pulsed solution, has a suction adaptor and built in battery pack, its fully disposable and designed for use in orthopaedic surgical procedures.

Every segmental lobe was repeatedly washed (4-5 cycles) for 8-10 seconds with slow installation of 150-200 ml warmed saline. The fluid of every cycle was subsequently drained through the device. A total of 5,6 litres were administered with 4,8 litres return. Directly afterwards the patient was extubated and transferred to the ward.

The procedure during the right lung lavage was better standardized and better tolerated due to the improved lung function three weeks after the first session. In two hours a total of 9 litres were administered with 8.85 litres return.

Three weeks after the second lung lavage, at the follow up visit, the saturation was normal (97%). Pulmonary Function tests were significantly improved: Forced Vital Capacity by 25,8% Total Lung Capacity by 20,8% and Diffusion by 10,5%.

Conclusion

We propose a less invasive technique with no need for double lumen intubation and lung isolation, with controlled and homogenous lavage, with less installed and residual fluid, no need for positioning, physiotherapy or vest, fast extubation, no prolonged mechanical ventilation and less procedural time.

Disclosure of funding source(s): none

Abstract #96

Forgotten grass aspiration during a childhood game - complications in adulthood

G. Glodić^a (Dr), A. Petrović Vlahović^b (Dr), F. Popović^a (Dr), M. Samaržija^a (Pr), S. Badovinac^a (Dr)

^a University Hospital Centre Zagreb, Zagreb, CROATIE ; ^b Special hospital for lung disease "Rockefellerova", Zagreb, CROATIE

Background: Endobronchial foreign body is a rare but potentially life-threatening diagnosis. If not recognized and treated promptly, it can cause recurrent pneumonia, bronchiectasis, recurrent haemoptysis and other complications. Here we present a case of a bizarre foreign body found in a patient with a history of recurrent pneumonia.

Case report: A 19-year-old male with a history of recurrent pneumonia and no other comorbidities was admitted to our tertiary teaching hospital for further diagnostic evaluation after a foreign body with a metallic appearance and empyema were revealed on a chest CT scan in another institution. Flexible bronchoscopy discovered a branched black foreign body covered in pus in the lateral segment of the right lower lobe (RB9). Extraction with forceps was attempted but the foreign body disintegrated so it was only partially removed. Particles of the foreign body were immediately recognized by the patient and identified as a grass known as wall barley (*Hordeum murinum*). He remembered he accidentally inhaled it during a game in his childhood but did not consider that information significant. With a tendency of complete removal, a combined rigid and flexible bronchoscopy was performed under general anaesthesia. Parts of the grass were repeatedly extracted with standard biopsy forceps and rat tooth grasping forceps until completely removed. A follow-up CT scan described cystically dilated bronchi in the RB9 segment and no remaining foreign body.

Conclusion: Even if not obvious from patient history, endobronchial foreign body should be considered as a possible differential diagnosis of recurrent pneumonia. Mineralization of organic material trapped in the airway for a prolonged period of time can lead to unusual appearances on conventional chest films and CT scans. Timely recognition of foreign body aspiration and accessibility of rigid bronchoscopy can reduce long-term complications such as recurrent pneumonia and bronchiectasis.

Disclosure of funding source(s): none

Abstract #97

Metagenomic Next-Generation Sequencing for severe pneumonia after allogeneic transplantation Diagnosis: Lung Biopsy versus Bronchoalveolar Lavage Fluid

J. Junhong*^a (Pr), W. Il^a (Mlle)

^a *Department of Pulmonary and Critical Care Medicine, Dushu Lake Hospital Affiliated to Soochow University, Suzhou, China, Suzhou, CHINE*

Purpose: To discuss the value with metagenetic second-generation sequencing (mNGS) from different sources specimens, about patients diagnosed with severe pneumonia after allogeneic hematopoietic stem cell transplantation (allo-HSCT). **Method:** A total of 54 patients with severe pneumonia after allo-HSCT from April 2018 to October 2021 were included in this retrospective study. All patients' specimens in the same site were collected through bronchoscopy. All completed mNGS detection. Compared the performance of two specimen assays for mNGS detection in diagnosis and pathogen identification, comparing differences in the types of pathogenic bacteria detected by the two samples. **Results:** In 54 patients who underwent bronchoscopy, none of them developed severe complications. The positive rate of mNGS was 74.1% in lung tissue and 66.7% in BALFmNGS. The positive rate of combined detection of the two was significantly increased. In bacteria, viruses and fungi, respectively, the positive detection rate of the two samples was not statistically significant. **Conclusion:** In patients with severe pneumonia after allo-HSCT, there was no significant difference in the diagnostic performance between lung tissue mNGS and BALF mNGS, and the positive rate of the combination of the two was high, while its negative rate could rule out the diagnosis to some extent.

Disclosure of funding source(s): none

Abstract #98

Hypoxia inhibits fibroblast collagen deposition in tracheoesophageal fistulas through autophagy.

X. Xu^a (Dr), J. Li^{a*} (Pr), J. Cui^a (Dr), Z. Liu^a (Dr), Y. Wang^a (Dr), S. Li^a (Dr), D. Chen^a (Dr)

^a *Guangdong Provincial People's Hospital, Guangzhou, CHINE*

Objective

To explore the mechanism of hypoxia-mediated autophagy in the formation of post intubation tracheoesophageal fistula.

Methods

1. Detect the expression of HIF-1 α and α -SMA in normal tracheal tissue samples and tracheoesophageal fistula samples by immunohistochemistry;
2. Divide the tracheal fibroblasts into 2 groups: Normoxia group and hypoxia group. The two groups of cells were cultured in 21% O₂ and 1% O₂ incubators respectively, and the migration capacity of the two groups of cells at 0h, 12h, and 24h was determined by scratch experiment; after the two groups of cells were cultured for 12h, the cells were collected to extract protein, and the expression of HIF-1 α and α -SMA and autophagy-related proteins and Col-1 was determined by Western Blot method; the expression of α -SMA was analyzed by cell immunofluorescence.
3. The experiment was divided into four groups: Normoxia group (21% O₂), hypoxia group (1% O₂), CQ (10 μ M, 24h) + hypoxia group (1% O₂, 12h), RP (1 μ M, 24h) + hypoxia group (1% O₂, 12h). α -SMA and Col-1 expression were determined by immunofluorescence and Western Blot respectively.

Results

1. Expression of HIF-1 α and α -SMA in tracheoesophageal fistulas is increased.
2. Hypoxia had no effect on the migration ability of tracheal fibroblasts.
3. Under hypoxic condition, the expression of HIF-1 α and α -SMA in human tracheal fibroblasts is increased.
4. Under hypoxic condition, the autophagy activity of tracheal fibroblasts is enhanced, and expression of Col-1 is reduced.
5. Under hypoxic condition, autophagy activity was inversely correlated with Col-1 expression in tracheal fibroblasts

Conclusion

Hypoxia promotes the differentiation of tracheal fibroblasts into myofibroblasts. Under hypoxic conditions, the autophagy flux of tracheal fibroblasts increases, inhibiting the production of tracheal fibrosis, possibly by promoting the breakdown of collagen in tracheal fibroblasts.

Key words : Hypoxia, Benign acquired tracheoesophageal fistula, Tracheal fibroblasts, Autophagy

Disclosure of funding source(s): none

Abstract #99

“One tube two ways” technique in tracheoesophageal fistula: esophageal metal stent removal and tracheal Y silicone stent placement in a rigid bronchoscopy procedure

H. Xu^a (Dr), S. Li^a (Pr), Y. Chen^{*a} (Pr)

^a *GuangZhou Medical University First Affiliated Hospital/Guangzhou Institute of Respiratory Health/ National Center of Respiratory Medicine, Guangzhou, CHINE*

Objective : To evaluate the curative effect of removing esophageal metal stent and placing Y silicone stent by a rigid bronchoscopy to treat the tracheoesophageal fistula caused by metal stent placement for esophageal cancer.

Methods :

Participants: Patients who were diagnosed with esophageal cancer and tracheoesophageal fistula in our department from January 2018 to May 2021.

Remove the esophageal metal stent: Under general anesthesia and muscle relaxation, ventilation is maintained by chest tube; Insert the 14 mm rigid bronchoscopy to the esophagus 2 cm per step guided by balloon, which half in rigid bronchoscopy and half in the esophagus and dilated from 12-14 mm; The incarcerated oversized metal stent were gripped, twisted and pulled by rigid forceps.

Insert the Y silicone stent: remove the chest tube and replace the 14 mm rigid bronchoscopy. According to the characters location, size, number, and diameter of the fistula, to cut and place the Y silicone stent at the bedside.

Reexamination of bronchoscopy after operation, regular outpatient follow-up and chest CT.

Results : 15 patients were enrolled, 12 males and 3 females. All cases completed the planned bronchoscopy operation and successfully resuscitated the extubation under general anesthesia.

Dyspnea and airway obstruction were relieved in all cases immediately after operation, the fistulas were completely closed/covered, no significant reflux. During the follow-up period, no significant migration; airway obstruction due to tumor proliferation has been founded in 4 patients who require interventional treatment to maintain the curative effect; Only little granulation tissue hyperplasia were founded in 6 patients. No death or immediate complications related to stent or interventional operation.

Conclusion :

Esophageal metal stent removal and tracheal Y silicone stent placement in a rigid bronchoscopy procedure for tracheoesophageal fistula caused by esophageal metal stent is safe and effective, and more convenient compared with traditional surgery operation.

Disclosure of funding source(s): none

Abstract #100

Therapeutic effect and mechanism of bronchoscopic cryoablation on airway stenosis caused by tracheal cartilage injury in rabbits

J. Junhong^{*a} (Pr), W. Il^a (Mlle)

^a *Department of Pulmonary and Critical Care Medicine, Dushu Lake Hospital Affiliated to Soochow University, Suzhou, China, Suzhou, CHINE*

Objective: To establish a rabbit model of tracheal chondrocyte injury, and to observe the therapeutic effect of cryoablation on cartilage injury-induced airway stenosis by EB-OCT analysis under bronchoscopy.

METHODS: Rabbit tracheal chondrocyte injury model was established and identified. Western blot, real-time quantitative PCR, flow cytometry TUNEL technology, and CCK8 method were used to detect chondrocyte injury at 4 time points before and 1, 3, and 5 days after injury. Collagenase type (coll-II), matrix metalloproteinase 1 (MMP-1), matrix metalloproteinase 13 (MMP-13), matrix metalloproteinase inhibitor 1 (TIMP-1) mRNA expression and change trend. The characteristics of bronchoscopy and EB-OCT images were observed in animals at 2, 4, and 6 weeks after operation.

Results: Rabbit tracheal chondrocytes were successfully cultured, and a chondrocyte injury model was established. The gray value of MMP-1 and MMP13 in the freezing group and the injured group gradually increased after modeling, and the gray value of COL-II gradually decreased. After injury, the values of MMP-1 and MMP13 in the freezing group increased and then decreased, and COL-II decreased and then increased gradually compared with the injury group, and the difference was statistically significant. After injury, the apoptosis rate of the cryoablation group was significantly lower than that of the injury group, and the difference was statistically significant.

Conclusion: Rabbit tracheal chondrocytes were successfully cultured by simplified trypsin and type II collagenase sequential digestion. Compared with normal chondrocytes, the injured tracheal chondrocytes had higher expression of MMP-1 and MMP-13, and lower expression of COL-II. Cryotherapy of injured tracheal chondrocytes has a certain therapeutic effect on injured chondrocytes by inhibiting the expression of MMP-1 and MMP-13, increasing the expression of COL-II, and reducing apoptosis. Bronchoscopic cryo-freeze-thaw therapy has a certain therapeutic effect on airway stenosis caused by tracheal cartilage.

Disclosure of funding source(s): none

Abstract #101

Value of electromagnetic navigation bronchoscopy combined with radial ultrasound in diagnosis of small peripheral lung lesions

Y. Fu^a (M.), J. Jiang^{*a} (Pr)

^a Department of Pulmonary and Critical Care Medicine, Dushu Lake Hospital Affiliated to Soochow University, Suzhou, China; Department of Pulmonary and Critical Care Medicine, The First Affiliated Hospital of Soochow University, Suzhou, China., Suzhou, CHINE

[Abstract] Objective To study the application of electromagnetic navigation technology (ENB) combined with radial ultrasound (r-EBUS) in the diagnosis and treatment of small peripheral pulmonary lesions (average lesion size was 18.95mm and mean distance between pleura and lesion was 1.27cm). **Methods** ENB was performed by fiberoptic bronchoscopy; the location of the lesion was determined by radial ultrasound after navigation, and biopsy specimens were obtained through the working channel. **Results** A total of 33 lesions in 32 cases, the navigation success rate was success rate was 87.87%(29/33). The sensitivity, specificity, agreement rate, negative predict value and Youden index were 50%(6/12), 100%(21/21), 81.82%(27/33), 77.7%(21/27) and 0.5, respectively. The consistency of ENB combined with r-EBUS and gold standard was moderate (Kappa=0.56). **Conclusion** For small peripheral pulmonary lesions, ENB can be promoted as a new effective bronchoscopy technique in combination with radial ultrasound.

Disclosure of funding source(s):
Lunhealth Medtech Company

Abstract #103

The innovative solution for tracheal reconstruction in the treatment of benign tracheal stenosis

M. Rusakov^a (Pr), V. Parshin^a (Pr), M. Simonova*^a (Dr)

^a Sechenov University Hospital, Moscow, RUSSIE, FÉDÉRATION DE

Background: T-tube tracheal reconstruction is an effective method for benign tracheal stenosis treatment. We propose our technique of T-tube tracheal reconstruction, which has been successfully performed since 1980-s.

Methods: The idea of proposed technique is a surgical tracheoplasty (dissection of the tracheal scar tissue and tracheoplasty with soft neck tissue with the subsequent T-tube placement to form a tracheal lumen). The main difference from the classic Montgomery T-tube is the use of a wider external limb (diameter 23 mm). Due to a large tracheal stoma, the extraction and placement of the T-tube is carried out through the stoma without the use of bronchoscope. In most cases, patients can remove the tube to clean it themselves and a doctor can easily adjust the T-tube. Usually a T-tube stays in place for 6 months, after this patient is decannulated and a monitoring period (without a tube) is carried out for 2-4 weeks. After that, tracheoscopy is performed to estimate the tracheal lumen. If the diameter of the lumen is sufficient, closure of the persistent stoma via soft neck tissue is performed. If the lumen is insufficient, retracheoplasty is done.

Results: 495 patients who underwent 1210 T-tube tracheal reconstructions from 2001 to 2021 were recruited. 135 (27.27%) patients underwent 2 tracheal reconstructions, 210 (42.43%) patients underwent 3 reconstructions, 150 (30.3%) patients underwent 4 and more reconstructions. 352 (71.11%) patients successfully completed treatment with subsequent closure of stoma. 9 (1.89%) patients remain long-term tracheotomized (tracheostomy tube or T-tube). 85 (17.17%) patients undergo treatment at present. Hospital mortality was 0.81% of the total number of patients.

Conclusion: The innovative T-tube tracheal reconstruction demonstrates high efficiency. This technique is very convenient for both: a patient, who can care for the T-tube and stoma by himself, and a doctor, who can model the tube easily.

Disclosure of funding source(s): none

Abstract #105

Feasibility and safety of pleural biopsy using rigid forceps in semi-rigid medical thoracoscopy

S. Kang^a (Dr), JY. Kim^b (Pr), C. Pak^a (Pr), JH. Kim^a (Pr), SW. Ra^a (Pr), Y. Jegal^a (Pr), KW. Seo^a (Pr), JJ. Ahn^a (Pr), T. Lee^a (Pr), G. Chae^a (Pr)

^a Department of Internal Medicine, Ulsan University Hospital, University of Ulsan College of Medicine, Ulsan, CORÉE, RÉPUBLIQUE DE ; ^b Division of Allergy and Respiratory Medicine, Department of Internal Medicine, Soonchunhyang University Cheonan Hospital, Cheonan-Si, Chungcheongnam-Do, CORÉE, RÉPUBLIQUE DE

Background: Semi-rigid medical thoracoscopy (MT) is a pleural procedure that could be easily performed by a pulmonologist. However, the flexible forceps biopsy through working channel of semi-rigid thoracoscope has a disadvantage in that the diagnostic yield is not high due to the small size of biopsy specimen (compared to the rigid forceps biopsy) and the procedure time is long to acquire a large number of biopsy specimens. To overcome these limitations, methods such as cryobiopsy have been used for MT. Recently, we have successfully used rigid forceps (used in rigid MT) in semi-rigid MT. We would like to share our experience and report short-term data on feasibility and safety.

Methods: Insertion of rigid forceps [34410MB (Karl Storz, Germany): outside diameter [OD] 5mm, length [L] 43cm; 10371L (Karl Storz, Germany): OD 2mm, L 35cm] was done with careful insertion tip rotation in the chest wall opening outside the dedicated trocar of semi-rigid thoracoscope [LTF-240 (Olympus, Japan)]. We retrospectively analyzed patients who underwent the semi-rigid MT using rigid forceps between November 2020 and April 2022 at Ulsan University Hospital.

Results: Forty patients [age (years, mean \pm SD): 69.2 \pm 12.8; male (n, %): 23, 57.5%] underwent semi-rigid MT using rigid forceps. All patients succeeded in inserting rigid forceps during semi-rigid MT. Regarding safety issues, no patients died due to complications related to the semi-rigid MT, and no significant bleeding or infectious complication was noted. Chest tube removal was successfully performed within 7 days in 75% (30/40) at 4.4 \pm 2.1 day. The main cause of delayed removal was that the volume of drainage continued due to malignant effusion. The longest diameter of the biopsy specimens was 1.4 \pm 1.2 cm, and definitive pathologic diagnostic yield was 80% (32/40).

Conclusion: In semi-rigid MT, pleural biopsy using rigid forceps was feasible and safely performed.

Disclosure of funding source(s): none

Abstract #106

A prospective study of position selection combined with autologous blood intrathoracic infusion in the treatment of postoperative persistent air leakage

H. Zhang^{*a} (Pr), C. Ge^a (M.), C. Chen^b (Mlle), Z. Zheng^a (M.), G. Xue^a (M.), W. Xu^a (M.), C. Duan^a (Mme), Y. Cai^a (M.), W. Zhang^a (Mme), L. Wang^a (Mme), Z. Sun^a (Mme), Z. Li^a (Mme)

^a Department of Respiratory and Critical Care Medicine, Rizhao Hospital of Traditional Chinese Medicine, Rizhao City, Shandong Province, CHINE ; ^b Department of Respiratory Medicine, Rizhao People's Hospital, Rizhao City, Shandong Province, CHINE

Background Persistent air leakage (PAL), generally defined as air leakage persisting despite 3 days of water seal drainage, is a common complication of thoracotomy and VATS. It may result in poor prognosis. Our innovative medical thoracoscopic intervention for spontaneous pneumothorax and giant emphysematous bulla (MTIFSPGEB) also faced PAL. We had proposed an effective innovative comprehensive intervention method, utilizing the effects of position selection, continuous negative pressure suction and thrombin (hereinafter referred to as "position plus 1.0") in PAL with expanded lung after MTIFSPGEB. For PAL patients with an unexpanded lung or those who failed to respond to "position plus 1.0", 100ml autologous blood and 5000IU thrombin dissolved in 10ml physiological saline were injected into thoracic cavity in turn combined with body position selection, namely "position plus 2.0". The efficacy and safety of "position plus 2.0" were investigated in this study.

Methods It was a prospective study conducted from 2020 to 2022. PAL after MTIFSPGEB with an unexpanded lung on CT or PAL after the application of "position plus 1.0" was treated by "position plus 2.0". Catheter drainage was continued with or without negative pressure suction (-16~-20cmH₂O), while maintaining the selected body position for 24-48 hours. If there was still air leakage after 48 hours, the above steps would be repeated until leakage stopped, up to 3 times.

Results 17 patients were included. After the intervention of "position plus 2.0", PAL was stopped successfully in 16 cases (94.12%). The times of "position plus 2.0" applied was 1.0(1.0, 1.5). During hospitalization, PAL relapsed in 3 cases (17.65%). Complications included fever (4 cases), pleural effusion (4 cases) and empyema (1 case).

Conclusion The comprehensive intervention "position plus 2.0" is safe, effective and easy to operate for the treatment of PAL with unexpanded lung after MTIFSPGEB or PAL after the application of "position plus 1.0".

Disclosure of funding source(s):

Shandong Province Development Project for Medical Health Science and Technology (202003021202)

Abstract #107

Unusual manifestation of persistent pleural and pericardial effusion a case report

A. Fathurrachman^a (Dr), A. Zen^a (Dr), A. Linda^a (Dr), S. Sudarto^a (Dr), P. Rouilly^a (Dr), A. Rasyid^a (Dr)

^a PERPARI SUMSEL, Palembang, INDONÉSIE

Introduction: Pleural effusion is abnormal fluid accumulation in pleural space. Pericardial effusion is abnormal fluid accumulation in pericard space, it is classified in mild effusion (< 10 mm), moderate effusion (10-20 mm), severe effusion (> 20 mm). Persistent effusion is intermittent accumulation of effusion in sub space.

Case Report: A man, 32 yo. Came to emergency room with dyspnea since 3 days ago. Patient with history of pleuritis exudativa tuberculosis since 1 month ago, and taking intensive phase of tuberculosis drug every day in the morning. Sensorium composmentis, Blood pressure 90/60 mmHg. HR 120 x/m. RR 30 x/m. Temperature afebris. Muffling heart sound. Echocardiography: moderate pericardial effusion. We do pericardiocentesis and left thoracosynthesis, the fluid was serous xanthochrome. As long as our treatment around 3 weeks, the patient repeat pericard effusion and we do 4 times pericardiocentesis. Cytology was chronic granulomatous, Gen Xpert of pericard and pleural fluid not detected mycobacterium tuberculosis, Pericard and pleural fluid culture: Mycobacterium tuberculosis. We continue the Fixed Dose Combination tuberculosis therapy. Add metilprednisolon 3x8 mg and titrate the dose every 2 weeks.

Discussion: In this case, even though the patient got Fixed Dose Combination therapy for 1 month, the fluid persist in pericard and pleural space, and it manifest like cardiac tamponade. Its a dilemma because basically after > 2 weeks druf therapy the Mycobacterium Tuberculosis should be eliminate. We think another immunocompromised condition but null. We think bacteria resistant but null. We use adjuvant therapy for persistent effusion that caused by Mycobacterium tuberculosis that proved by culture.

Conclusion: Additional therapy for persistent effusion in pericard and pleura should be given to reduce effusion that can cause cardiac tamponade if misdiagnosed. Additional corticosteroid should be preferred.

Disclosure of funding source(s): none

Abstract #108

A New Anesthesia Method for Montgomery T-tube Tracheal Stent Implantation

Z. Yang^a (Pr), J. Jiang^{*a} (Pr)

^a *Department of Respiratory and Critical Care Medicine, Dushu Lake Hospital affiliated to Soochow University, Suzhou, CHINE*

Background: The Montgomery T-tube tracheal stent(Montgomery T-tube) is often used to treat subglottic stenosis, and the general anesthesia carried out by an anesthesiologist and the rigid bronchoscopy performed by an endoscopist are required for the placement of Montgomery T-tube. However, this way is not suitable for all types of patients.

Case presentation: Here, we describe a patient with cervical spinal cord injury and incomplete paraplegia who was successfully implanted with Montgomery T-tube for subglottic stenosis after intravenous induction of conscious sedation combined with high-flow nasal cannula oxygen(NFHC) and expect to provide a reference for the treatment of these patients.

Conclusions: Intravenous induction of conscious sedation combined with NFNC could help with Montgomery T-tube Implantation and the treatment of patients in this particular situation. However, more data are needed to support the use of this anesthesia method.

Disclosure of funding source(s): none

Abstract #109

Nocardia infection Presenting as a mediastinal mass in a ceramic worker diagnosed by EBUS-TBNA

W. Wu^a (Dr), X. Su^a (Mme), C. Lin^a (Dr), Z. Zhuang^b (M.), Z. Yixiang^a (Dr), X. Lin^a (Dr), H. Jiaming^a (Mme), Z. Zhu^a (Dr), Z. Huaping^{*a} (Dr)

^a *The Second Affiliated Hospital of Fujian Medical University, Quanzhou, CHINE* ; ^b *Quanzhou Jinjiang Anhai Hospital, Quanzhou, CHINE*

Background: Nocardia is ubiquitous soil saprophytes that are transmitted by either airborne or direct cutaneous inoculation route. Nocardia species more frequently cause invasive infections in immunocompromised patients but might be observed in immunocompetent patients. **Case presentation:** We report a rare case of Nocardia infection presenting as a large mediastinal mass in an immunocompetent ceramic worker. A 54-year-old man with no previous history of immune dysfunction, a ceramic worker by profession, was referred and admitted to our hospital because of a persistent fever for 19 days. Chest CT showed multiple nodules on the right lung and a large middle mediastinal mass. Anti-infective treatment was ineffective. To identify the etiology, we performed Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) and obtained purulent exudates which were further identified as Nocardia species by weakly acid-fast and metagenomic next-generation sequencing (mNGS). He was subsequently treated with intravenous imipenem/amikacin, switched to intravenous imipenem and oral trimethoprim/sulfamethoxazole, and the clinical symptoms were significantly improved. After this, the patient improved and he was discharged. He continued on oral trimethoprim-sulfamethoxazole for 6 months. During the last year and a half of follow-up, the patient recovered well, with no complications, and CT findings of the mediastinal mass improved significantly. **Conclusions:** Patients with subacute to chronic respiratory symptoms, elevated inflammatory markers, mediastinal masses, a history of soil-related occupational exposure, and absence of common respiratory pathogens under evaluation are high indicators of suspected Nocardia infection. An invasive approach may be necessary to obtain tissue diagnosis to direct treatment in these cases. EBUS-TBNA is a useful and safe technique for the diagnosis of mediastinal infectious lymphadenopathy of unknown origin. Once the diagnosis is established, prompt antibiotic therapy should be performed, and these appropriate medications can lead to significant radiological improvement.

Disclosure of funding source(s):

This work was sponsored by the Fujian Provincial Natural Science Foundation (2021J01258) and the Talent Training Project of the Provincial Respiratory Medical Center (HXZX202204).

Abstract #110

Lung abscess with complicated loculated empyema a case report

A. Fathurrachman^{*a} (Dr), A. Zen^a (Dr), A. Linda^a (Dr), S. Sudarto^a (Dr), P. Rouilly^a (Dr), A. Rasyid^a (Dr)

^a *PERPARI SUMSEL, Palembang, INDONÉSIE*

Introduction: Nowadays lung abscess event are quite rare due to improvement in medicine, except in special population like immunocompromised. If not treated well th mortality of lung abscess around 15-20 %. Complication thorough bronchus or surrounding tissue can lead to empyema, which lead indication to operate.

Case Report: A man, 43 yo. Came to pulmonologist ward with right chest pain since 6 days ago. Patient with white purulent sputum since 2 weeks ago. No history of any lung disease or any metabolic disease. Sensorium composmentis, Blood pressure 110/70 mmHg. HR 100 x/m. RR 30 x/m. VAS 7. Temperature 38C. Right lung: stem fremitus somber from V intercostae. Chest X-ray: right lung abscess. Lung ultrasonography: loculated effusion on lower lobe chest. We do thoracosynthesis, the fluid was thick green liquid and bad odor. As long as our treatment around 1 weeks with several drainase, the patient repeat pleural effusion. So, we refer the patient to cardiothoracic surgery department, and perform right lung decortication and remove the loculated pleural sac. and we give clindamycin for 1 month. After 1 month there are no any persistent pleural effusion and chest xray follow up showed good improvement on right lung.

Discussion: In this case, even though the patient got several thoracosynthesis and drug combination therapy. The effusion keep persist. This is due to the loculated sac are remain, and keep producing effusion.

Conclusion: in patient with lung abscess we must treat the patient fast and well. SO, there are no more complication arise. And preferred to remove the pleural sac by operate if the effusion persistent.

Disclosure of funding source(s): none

Abstract #111

The choice of TEF nutrition

Y. Wang^{*a} (Dr)

^a *Department of Pulmonary and Critical Care Medicine, Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences, Guangzhou, CHINE*

Tracheoesophageal fistula (TEF) is a refractory clinical complication, commonly seen after esophageal cancer or lung cancer surgery, with extremely high mortality and poor prognosis. Aspiration pneumonia is the main complication of TEF. There are various causes of aspiration pneumonia. The clinical manifestations of aspiration pneumonia caused by different airway inhalations are different.

Aim

To explore the effect of different dietary patterns on TEF aspiration pneumonia and the source of TEF airway reflux

Methods

Six experimental beagle dogs were used, numbered 2101-2103, 3101-3103. Using the method of mid-neck incision. The Medtronic aortic punch was used to construct the tracheal and esophageal fistulas. After the completion of construction, 2101-2103 animals were fed by nasogastric feeding tube, and 3101-3103 animals were fed by intravenous nutrition. The airway secretions and inhalations were observed by bronchoscopy within a one-week observation period, and the properties of secretions and inhalations were recorded. After the observation, the animals were sacrificed and the animals were dissected to observe the source of inhalation

Result

1. Compared with intravenous nutrition, although the nasogastric feeding tube can effectively cross the fistula site, the flow diet causes more airway aspiration and airway secretion than intravenous nutrition, and the anatomical results show that the flow diet Lung inflammation was more severe in diet animals, with smaller areas of lung consolidation
2. According to our results, the main source of airway inhalation is the reflux of gastric contents. The properties of these substances are similar, and in the case of intravenous nutrition, there is still a certain risk of airway aspiration due to gastric secretion.

Conclusion

Compared with nasogastric feeding tube flow diet, intravenous nutrition can better relieve TEF airway content accumulation and aspiration pneumonia. At the same time, the main source of intra-airway reflux aspiration is gastric secretion.

Disclosure of funding source(s): none

Abstract #112

Endoscopic resection with ablation therapy for primary endotracheal adenoid cystadenocarcinoma

Q. Liu^a (Dr)

^a *Shanghai East Hospital, Shanghai, CHINE*

Without enough study due to the rarity of disease, treatment of TACC is still controversial today. Currently commonly used treatment methods for TACC include surgery, radiotherapy, or chemotherapy. Result of a recent published systematic review indicate that further exploration for better treatments and better-quality data to provided directions for physicians is still expected based on limited evidence. We still have not enough evidence to evaluate thermal ablation or cryoablation for TACC. Here we described an endotracheal intubated 34-year-old female of Primary endotracheal adenoid cystadenocarcinoma (TACC) who was misdiagnosed for more than 3 years. She was received endoscopic resection with repeated thermal ablation followed by cryoablation therapy and radiotherapy 5 years later. No metastasis or breathing difficulties was observed within nearly 10 years following up. Evaluation of the endoscopy therapy over extensive surgical resection for TACC is urged.

Disclosure of funding source(s): none

Abstract #113

Diagnostic yield and safety of bronchoscopic lung cryobiopsy in evaluation of pulmonary lesions

M. Encheva^a (Pr), S. Zabadanova^a (Dr), E. Naseva^b (Pr), G. Hinkova^a (Dr), H. Yordanov^a (Dr), P. Titorenkov^a (Dr)

^a Military Medical Academy, Sofia, BULGARIE ; ^b Medical University of Sofia, Sofia, BULGARIE

Background: Endobronchial and peripheral pulmonary lesions are commonly considered as neoplasms until proven otherwise. Bronchoscopic lung cryobiopsy (BLCB) is a novel technique for diagnosing histologically transbronchial and endobronchial large samples obtained with minimal artifacts.

Objectives: Diagnostic yield of BLCB in central and peripheral pulmonary lesions; relationship between demographic data and risk factors of the patients and the histological variant of the identified neoplasm.

Methods: A retrospective study (January 2021 - January 2022) of 131 patients with CT-positives pulmonary lesions (central and peripheral) who underwent BLCB using 2.4 and 1.9 mm cryoprobe. Diagnostic yield of BLCB was analysed as a positive diagnosis after histological and immunohistochemical examination along with the complications rate of the procedure.

Results: Neoplasms were identified in 94.6% of 373 biopsies, performed on 131 patients. 95.7% of patients with centrally located lesions (n=116) showed neoplasms. The total number of biopsies in patients with peripheral lesions (n=15) was 33 as 22 of them showed neoplasm (66.7%). A relationship between lesions location and histological outcome was established ($p < 0.001$). In patients with adenocarcinoma, the number of comorbidities was significantly lower ($p = 0.009$). Squamous cell carcinoma was more common in patients with comorbidities ($p < 0.0001$) - COPD ($p = 0.024$), AH ($p = 0.05$), DM ($p = 0.008$). The age of patients with squamous cell carcinoma was significantly higher ($p = 0.005$), and the number of comorbidities was substantially greater ($p = 0.001$). The mean age of carcinoid patients was significantly lower ($p = 0.003$). Carcinoid was considerably more common in non-smokers ($p = 0.012$) with no risk factors ($p = 0.010$). Metastasis were found much more frequently among patients with any neoplasm ($p < 0.001$). Bleeding after BLCB occurred in 29% of cases; no pneumothorax was found. Bleeding was observed more commonly after BLCB of metastases ($p = 0.059$)

Conclusions: BLCB represents a safer and promising technique with a great diagnostic yield in identification of central and peripheral pulmonary lesions.

Disclosure of funding source(s): none

Abstract #114

Electromagnetic Navigation Bronchoscopy guided indocyanine green injection for localization of pulmonary nodules-system review and meta-analysis

X. Mao^a (Dr), H. Hu^a (Dr), E. Chen^{*a} (Pr)

^a Sir Run Run Shaw Hospital, School of Medicine, Zhejiang University, Hangzhou, CHINE

Background: Precious location for peripheral pulmonary lesions (PPLs) is crucial for surgery operation. Injection indocyanine green (ICG) with the guidance of electromagnetic navigation bronchoscope (ENB) is newly developed method in locating PPLs. But the operation success rate various in different centers. Thus we conducted this meta-analysis to evaluate the pooled operation success rate of this new method.

Method: We used the key words of “ICG” or “indocyanine green” AND “electromagnetic navigation” AND “lung” or “pulmonary”. Publications before 31st Mach, 2022 are searched. The references of selected studies were also reviewed. The detailed data were extracted, respectively. And the operation success rate was pooled with the STATA 22.0.

Result: Finally, four studies, including 309 PPLs, are enrolled in meta-analysis. The operation success rate various from 86.0% to 100.0%, and the pooled operation success rate is 93.2% (95% confidence interval: 86.0 - 98.2%). No complications reported.

Conclusion: Injection ICG with the guidance of electromagnetic navigation bronchoscope (ENB) is a excellent method in locating PPLs.

Disclosure of funding source(s):

This work was support by Key R&D Program of Zhejiang (2022C03086).

Abstract #115

The contribution of bronchial fibroscopy in intensive care and surgery departments.

Y. Benbetka*^a (Pr)

^a *CHU LAMINE DEBAGHINE, Alger, ALGÉRIE*

First described in 1897 by Kilian; exploration of the subglottic airways has really developed, especially after the development of the flexible endoscope. We propose in this work, the study of the contribution of this bronchial fibroscopy in the intensive care and surgery departments as well as the various problems encountered. It is a retrospective study of 50 interventions at the level of the different services: - 20 for difficult intubation: Operating rooms. - 30 for aspiration : intensive care. In intensive care, the field of application of bronchial fibroscopy has extended, thus protected brushing and LBA make it possible to establish a diagnosis of bacterial pneumopathies with good specificity. Intubation is done by: - See nasal/buccal. - Tracheostomy tube). - Tracheal intubation tube Bronchial fibroscopy solves the problems of difficult intubation or probe positioning; patients at risk of difficult intubation are identified during the pre-anaesthesia consultation.

Disclosure of funding source(s): none

Abstract #116

Long-term follow-up of a novel TTS airway stent placement in malignant central airway obstruction

M. Zhang^{*a} (Mlle)

^a Suzhou Dushu Lake hospital / Dushu Lake Hospital Affiliated to Soochow University, Soochow, CHINE

Background: Metallic airway stent is an critical approach to malignant central airway obstruction (CAO). We demonstrated the efficacy of a novel through-the-scope (TTS) metallic airway stent system in previous study. We showed the long-term follow-up of the TTS stent system in malignant CAO patients.

Methods: From Jan 2015 to Dec 2021, 98 consecutive malignant CAO patients with airway stent implantation were enrolled. All patients were followed up to death or at least 60 months.

Results: 98 stents (59 OTW stents, 39 TTS stents) were implanted in 95 CAO patients guiding by a flexible bronchoscope under local anesthesia, or by rigid bronchoscope under general anesthesia. Stents were placed in the trachea (17 stents), right or left main bronchus (18 stents), and right middle bronchus (1 stent) respectively. The one-time successful rate was similar in two groups (100.00% vs. 97.67%). The mMRC score and stenosis grade improved significantly after stent implantation. The main short-term complications included secretion retention, granulation and tumor in-growth. The main long-term complications included granulation, tumor in-growth and stent fracture. The medium overall survival (OS) after stent implantation were 7.81 months in TTS group and 10.90 months in OTW group.

Conclusion:In the long-term follow-up malignant CAO patients ,the novel TTS stent system showed similar efficacy with OTW stent, but with less stent-relative complication.

Disclosure of funding source(s): none

Abstract #117

Clinical study of airway stent implantation in the treatment of patients with malignant central airway obstruction

Y. Xing^a (Mlle), J. Jiang^{*a} (Pr)

^a Department of Pulmonary and Critical Care Medicine, Dushu Lake Hospital Affiliated to Soochow University, Suzhou, CHINE

[Abstract] Objective To determine the clinical features and long-term results related to the improved prognosis of patients with malignant central airway obstruction (MCAO) after airway stent implantation. Methods A retrospective analysis of all patients who underwent stent placement for MCAO in our hospital from January 2013 to April 2020. Data were collected for each patient, including baseline data, clinical characteristics, laboratory test data, stent implantation data, treatment and survival after stent implantation. The survival rates were compared using Log-rank tests. Potential prognostic factors were identified using multivariate Cox hazard regression models. Results Total 98 consecutive patients who underwent airway stent placement due to MCAO were included in this study. Lung cancer (53/98, 54.08%), esophageal cancer (22/98, 22.45%) and thyroid cancer (3/98, 3.06%) were the main common diseases that caused MCAO in this study. The median survival time of these patients after airway stent placement was 5.5 months. Univariate analysis showed that primary disease, ECOG PS score, stent site, hemoglobin (Hb), albumin (ALB) and serum lactate dehydrogenase (LDH) were related to the survival rate of MCAO patients ($P < 0.05$). The Cox risk regression model showed that the ECOG PS score ($OR = 3.468$, $95\%CI = 1.426-8.432$, $P = 0.006$) and the stent site ($OR = 1.544$, $95\%CI = 1.057-2.255$, $P = 0.025$) were significantly related to survival rate. Conclusions The survival rate of MCAO patients after airway stenting is related to the ECOG PS score score prior to the stenting and the site of stent placement.

[Key words] Airway stent implantation; Malignant central airway obstruction; Cancer; Survival; Prognostic factors

Disclosure of funding source(s): none

Abstract #118

Weakly Supervised Hierarchical Multi-label Classification of Lung Cancer Types Based on Rapid On-Site Evaluation in Transbronchil Biopsy

J. Chen^a (Dr), C. Gu^a (Mlle), X. Zheng^a (Dr), Y. Li^a (Dr), F. Xie^a (Dr), S. Liu^a (M.), Y. Zhou^a (M.), J. Sun^{*a} (Pr)

^a Department of Respiratory Endoscopy, Department of Respiratory and Critical Care Medicine, Shanghai Chest Hospital, Shanghai Jiao Tong University, Shanghai, CHINE

Background: Rapid on-site evaluation (ROSE) plays a crucial role in determining the type of lung cancer to guide optimal management during transbronchil biopsy procedure. However, its application has been limited due to the insufficient and subjectivity of cytopathologists. This study aims to validate the weakly supervised deep convolutional neural network (DCNN) in the classification of lung cancer subtypes on the ROSE slide images.

Methods: A total of 811 ROSE whole slide images stained with Diff-Quik were retrospectively collected from Shanghai Chest Hospital between July 2019 and November 2020, which were randomly assigned for training, validation, and test. Hierarchical multi-label attention model (HMLAM) based on ResNet50 was proposed for the sorting the ROSE images, three internal sub-models (N1, N2, N3) were constructed to differentiate the subtypes of lung cancer: benign vs. malignant, malignant lesions subtyping, and non-small cell lung cancer subtyping. In the test dataset, the performance of HMLAM was compared with pathologists, interventional respiratory physicians and ROSE technicians.

Results: The area under the curve of HMLAM's three sub-models (N1, N2, N3) was 0.9032 (95%CI: 0.8530-0.9543), 0.8773 (95%CI: 0.8416-0.9129) and 0.8458 (95%CI: 0.7998-0.8918), and the accuracy was 0.8678, 0.7397, and 0.6733, respectively. Human-machine controlled test show that pathologists had the highest interrater consistency and accuracy, followed by the HMLAM achieved 0.5428 kappa and 0.6494 accuracy, outperforming interventional respiratory physicians and ROSE technicians subsequently.

Conclusions: This study presented that large-scale weakly supervised DCNN has the potential to assist respiratory interventionists in the subcategories of ROSE images during transbronchial sampling. Intuitively, HMLAM is expected to partially replace the function of cytopathologists, resulting in a substantial reduction in time and expense associated with the procedure in the bronchoscopy suite.

Disclosure of funding source(s): none

Abstract #119

Thoracoscopie médicale (MT) dans le diagnostic de l'épanchement pleural malin (MPE)

Y. Kheloui^a (Pr), S. Alihalassa^a (Pr)

^a *Public hospital establishment of Blida/faculty of medicine/university of Blida 1, Blida, ALGÉRIE*

I/Introduction : En présence d'une pleurésie, le recours à une aspiration pleurale suivie d'une biopsie à l'aiguille fait souvent partie d'une démarche diagnostique pratiquée. Cependant, le diagnostic de rendement de ces derniers reste dans le MPE.

II/ Matériels et méthodes : Une étude prospective de trois ans réalisée dans le service de pneumologie de Blida auprès de 120 patients admis pour problème diagnostique d'épanchement pleural liquidien récidivant malgré plusieurs cytologies et biopsies pleurales à l'aiguille, évoluant dans un contexte néoplasique ou non néoplasique et / soit la présence d'une notion d'exposition à l'amiante. Une thoracoscopie assistée par vidéo endoscopie utilisée, avec un portail unique sous anesthésie locale ou sédation consciente. Les services d'anatomie pathologique analysent toutes les biopsies réalisées et une étude en immunohistochimie réalisée. L'examen s'est terminé par un drainage pleural.

III/ Résultats : 116 patients inclus et 04 exclus, 64 hommes 56 femmes, l'âge moyen est de 58,75 +/- 3,88 ans, extrêmes 26 et 83 ans, PS <2, antécédent médical de néoplasie est retrouvé chez 52%, sinon aucun. Le résultat d'une cytologie positive est de 32%, négatif dans 68%, ou une positivité des biopsies pleurales à l'aiguille pratiquées sont positives dans 27% et négatives dans 73%. L'aspect macroscopique de la MT est évocateur de malignité dans 68 % des cas, non spécifique dans 26,7 % et normal dans 5,3 %. Le nombre de biopsies pleurales est compris entre 1 et 20 avec une moyenne de 07 ; le résultat histologique : carcinome 100cas (86%) autres 16(14%), cancer poumon 35%, sein 24%, mésothéliome 13%, autres carcinomes 28%. Le rendement du MT était de 99 %. La MT a révélé l'origine de la tumeur dans 42,2 %. Le drainage pleural a duré moins de 5 jours dans 91,4 % des cas retrait immédiat dans 36,2 % .

IV/Conclusion : La MT dans le diagnostic de l'EMP est très efficace, sûre et inoffensive.

Disclosure of funding source(s): none

Abstract #120

Pleurodèse chimique dans les épanchements pleuraux malins (EMP)

Y. Kheloui^a (Pr), S. Alihalassa^{*a} (Pr)

^a *Public hospital establishment of Blida/faculty of medicine/university of Blida 1, Blida, ALGÉRIE*

I-INTRODUCTION: chemical pleurodesis or talc Poudrage (TP) is one of the therapeutic options of MPE performed under medical thoracoscopy that has as objective, the pleural symphysis and the drying of the pleural effusion.

II-OBJECTIVE: To study the efficacy and safety of chemical pleurodesis.

III-MATERIALS AND METHODS: prospective study over three years including 46 patients with a proven or recurrent MPE with macroscopic features suggestive of neoplasia but systematically followed by biopsies. The TP carried out under TM, we used talc sterile, and the cyclines, we did not make the comparison between the two products. 82, 5% under local anesthesia (LA) and 17.5% LA + sedation. End examination by evaluation of diffusion of talc and pleural drainage.

IV -RESULTS:

52% women and 48% men were included, aged from 26 to 82 years with an average of 56.34 y. The neoplastic history found in 76%, 24 % have not neoplastic history. The breast cancer in 35%, lung in 15%, MPM in 7%, others in 20%. good diffusion is found in 87% against 13%, a pleural drainage is applied which lasted less than 5 days in 9%; 5 days in 87% ; 5 to 10 days 2%; more than 11 days 2%.

The post-operative complications are empyema 2%, air leaking 17.5%, fever 10.5%, subcutaneous emphysema 4%. No distress respiratory syndrome no death. Controlling at 30 days 85.5% pleurodesis success, at 60 days 80.5% of success.

V-DISCUSSION

VI- CONCLUSIONS: palliative treatment very effective and without risk for the patient against recurrence of effusion, dyspnea, and pain in MPE.

Keywords : pleurodesis, malignant pleural effusion ,efficiency

Disclosure of funding source(s): none

Abstract #121

Electromagnetic Navigation Bronchoscopy with Multimodalities for Peripheral Pulmonary Nodules: A Prospective, Multicenter, Cohort Study

Y. Li^a (Dr), W. Chen^b (Dr), F. Xie^a (Dr), R. Huang^c (Dr), X. Zheng^a (Dr), X. Liu^d (Dr), Y. Xiao^e (Dr), L. Cao^f (Pr), M. Ke^c (Pr), S. Wu^d (Pr), Y. Hu^e (Pr), J. Sun^{*a} (Pr)

^a Department of Respiratory Endoscopy, Department of Respiratory and Critical Care Medicine, Shanghai Chest Hospital, Shanghai Jiao Tong University, Shanghai, CHINE ; ^b Department of Pulmonary and Critical Care Medicine, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, CHINE ; ^c The Second Affiliated Hospital of Xiamen medical college, Xiamen, CHINE ; ^d Department of Pulmonary and Critical Care Medicine, The First Hospital of Shanxi Medical University, Taiyuan, CHINE ; ^e Department of Respiratory, Central Hospital of Wuhan, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, CHINE ; ^f Xiangya Hospital Central South University, Changsha, CHINE

Ying Li, Wei Chen, Fangfang Xie and Rui Huang contributed equally to this article.

Background: We reported a real-world application strategy of a novel electromagnetic navigation bronchoscopy (ENB) system for peripheral pulmonary nodules, in order to find the optimal diagnostic modalities based on lesions characteristics and individual operational preference of clinicians.

Methods: This prospective, cohort study enrolled consecutive patients adopted ENB between March 2019 and August 2021 at six clinical centers. ENB was flexibly applied with different modalities. The primary endpoint was the diagnostic yield of ENB based on at least 6-month follow up. Procedural details and complications were also recorded.

Results: A total of 479 subjects with 479 nodules were enrolled in this study. The average lesion size was 20.6±6.0 mm. The overall diagnostic yield of ENB bronchoscopy was 79.7% (382/479). The sensitivity for malignant nodules was 81.6% (298/365), and for benign nodules was 73.7% (84/114). The diagnosis yield of different guided strategies showed no significant difference. Univariate analysis identified lesion size, lesion property, CT-bronchus sign, rEBUS position, rapid-on-site evaluation (ROSE) were predictors associated with diagnostic yield. Lobar location, lesion nature, anesthesia, bronchoscopes, guided sheath, fluoroscopy were not identified to be associated with bronchoscopic diagnostic yield. Multivariate analysis showed that lesion size, lesion property and CT-bronchus sign were correlated with diagnosis yield. Complications occurred in 15 moderate bleeding during bronchoscopy and 1 pneumothorax which required tube drainage.

Conclusion: ENB is an efficient diagnostic tool for peripheral pulmonary lesions.

Disclosure of funding source(s): none

Abstract #122

Endobronchial Ultrasound Multimodal Videos Based Artificial Intelligence EBUSnet for Segmentation and Prediction of Intrathoracic Lymphadenopathy

J. Chen^a (Dr), J. Li^b (M.), C. Gu^a (Mlle), X. Zheng^a (Dr), Y. Li^a (Dr), F. Xie^a (Dr), S. Liu^a (M.), W. Dai^b (Pr), J. Sun^{*a} (Pr)

^a Department of Respiratory Endoscopy, Department of Respiratory and Critical Care Medicine, Shanghai Chest Hospital, Shanghai Jiao Tong University, Shanghai, CHINE ; ^b School of Electronic Information & Electrical Engineering, Shanghai Jiao Tong University, Shanghai, CHINE

Junxiang Chen, Jin Li and Chuanjia Gu contributed equally to this article.

Background: Endobronchial ultrasound (EBUS) imaging has been established as a cornerstone in initial detection and evaluation the nature of intrathoracic lymphadenopathy. Nevertheless, the inherent limitation of clinical practice due to the dynamic image related interpretation such as subjectivity of bronchoscopist and interobserver variability. In this study we developed a EBUS network (EBUSnet) for segmentation and prediction the property of intrathoracic lymphadenopathy based on EBUS multimodal videos.

Methods: In the study, 1006 lymph nodes (LNs) of EBUS videos were gathered from a single center between July 2018 and June 2020 retrospectively to train and validate the EBUSnet, which consists of region of interest detection module and real-time auxiliary diagnosis system. Between July and October 2020, 267 LNs of EBUS videos were prospectively gathered from multiple centers for test dataset. A transfer dataset containing 245 lung lesions of EBUS videos from a single center was collected retrospectively.

Results: In the validation and test cohort, the area under the curve (AUC) and accuracy of multimodal EBUSnet were 88.97% (95% CI: 84.13%-93.82%) and 81.20% (95% CI: 74.47%-87.94%), 84.90% (95% CI: 80.00%-89.80%) and 81.27% (95% CI: 76.07%-85.77%) respectively. The capability of multimodal EBUSnet in distinguishing benign and malignant LNs was superior to unimodal, also excellent than the qualitative analysis of experienced interventional pulmonologist. Besides, the multimodal EBUSnet had the tallest AUC of 80.87% (95% CI: 71.05%-90.68%) and accuracy of 87.07% (95% CI: 80.55%-92.04%) in the transfer cohort.

Conclusion: This study demonstrated that EBUSnet has a valuable performance and generalized ability in predicting the malignancy of intrathoracic lymphadenopathy and lung lesions. The EBUSnet may be beneficial to the automated real-time evaluation of targeted LNs, which assisted in EBUS procedure can valuable reducing unnecessary biopsies and shortening examination time.

Disclosure of funding source(s): none

Abstract #123

Investigating the diagnosis for TB pleurisy using medical thoracoscopy ; a novel specimen, targeted washing after pleural biopsy

YJ. Hong^a (Dr), J. Ryoo^b (Pr), JH. Ha^a (Pr), AY. Shin^a (Pr), JS. Kim^a (Pr), KH. Kim^a (Pr), JY. Choi^a (Pr), SH. Lee^c (Pr), HW. Kim^{*a} (Pr)

^a Division of Pulmonary, Allergy and Critical Care Medicine, Department of Internal Medicine, Incheon St. Mary's Hospital, The Catholic University of Korea School of Medicine, Incheon, CORÉE, RÉPUBLIQUE DE ; ^b Division of Respiratory and Critical care, Department of Internal Medicine, Bucheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Bucheon, CORÉE, RÉPUBLIQUE DE ; ^c Division of Pulmonary, Critical Care and Sleep Medicine, Department of Internal Medicine, Eunpyeong St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, CORÉE, RÉPUBLIQUE DE

Background: This study aimed to investigate the additional diagnostic yield of medical thoracoscopy (MT) on microbiological confirmation of tuberculous pleural effusion (TPE).

Methods: Medical records of patients who underwent MT and were diagnosed as TPE with microbiological or histologic evidence between 2016 and 2021 at Incheon St. Mary's hospital were retrospectively reviewed. Sensitivity of microbiological results (acid-fast bacilli (AFB) culture or TB-polymerase chain reaction (PCR)) of pre-MT pleural fluid and those of targeted pleural washing fluid and pleural tissue obtained during MT were compared. Difference of sensitivity was verified with McNemar's test.

Results: A total of 56 patients were enrolled. As for pre-MT pleural fluid, sensitivity of AFB culture and TB PCR was 7.1% (4/56) and 1.8% (1/56), respectively. As for targeted pleural washing fluid, sensitivity of AFB culture and TB-PCR was 26.8% (15/56) and 14.3% (8/56), respectively. As for pleural tissue, sensitivity of AFB culture and TB-PCR was 23.2% (13/56) and 50.0% (28/56), respectively. MT showed additional 32.1% (95% CI: 15.4% - 46.6%, $p < 0.001$) of sensitivity gain in AFB culture and 50.0% (95% CI: 32.1% - 63.7%, $p < 0.001$) in TB-PCR. With targeted pleural washing, additional 21.4% (95% CI: 5.9% - 35.9%, $p = 0.004$) of sensitivity gain in microbiological confirmation was identified, whereas additional 46.4% (95% CI: 27.9% - 60.9%, $p < 0.001$) of sensitivity gain was identified with pleural biopsy.

Conclusion: With MT, 60.7% of additional sensitivity gain in microbiological confirmation of TPE was identified, which underscores the role of MT in diagnosis of TPE.

Disclosure of funding source(s): none

Abstract #124

Drainage pleural après thoracoscopie médicale diagnostique(TM)

Y. Kheloui^a (Pr), S. Alihalassa^{*a} (Pr)

^a *Public hospital establishment of Blida/faculty of medicine/university of Blida 1, Blida, ALGÉRIE*

1-Introduction: Unexplained pleurisy requires TM for diagnostic purposes, which ends with the placement of a chest drain, the question of the removal of the drain is not yet decided, this is the reason why we will contribute by our experience in this field to enrich the literature.

2-Material and Methods: Retrospective study on files of patients admitted for TM diagnosis between 01-01-2006 and 31-12-2010, TM for pleurodesis and pneumothorax (PNO) excluded, i.e. 191 patients included in the study.

TM is performed under local anesthesia with a single entry point, pleural exploration and biopsies performed on the parietal pleura. A chest drain 24 F is inserted and connected to a suction system at the end of the examination. Lung re-expansion is evidenced by the absence of bubbling, clinical, ultrasound and radiological examination which determine the decision to withdraw the drain.

3-Results: free pleural cavity in 132 cases (73%) and reduced in 59. Out of 191,179 pleural biopsies performed, 85 (47.5%) malignant, 45 (25%) infectious, 41 (22%) non-specific inflammatory, 8 (4.5%) normal. Less than 4 hours of drainage in 121 cases (63%), 24 to 48 hours 52 cases (27%) more than 48 hours 18 cases (9%). Hospitalization was on average 14 days with 50% between 0 and 7 days, 30 % between 7 and 10 days, 18% more than 10 days. Complications were rare 08 cases in total (4%): 2 subcutaneous emphysemas, 03 sepsis, 3 persistent PNO.

4-Comments and conclusion: rapid removal (in less than 4 hours or even immediately) is possible, in our study it appears that: 63% removal before 4 hours, 90% removal within 48 hours following TM, which allowed us considerably shorten the duration of hospitalization and reduce morbidity and health costs.

Disclosure of funding source(s): none

Abstract #125

Radio-histological correlation of lung features in sever COVID-19 through CT-scan and lung ultrasound evaluation.

P. Trias-Sabrià^a (Dr), E. Dorca Duch^a (Dr), M. Molina Molina^a (Pr), S. Aso^a (Dr), M. Díez-Ferrer^a (Pr), A. Marin^a (Dr), J. Bordas^a (Dr), J. Sabater^a (Pr), P. Luburich^a (Pr), B. Del Río^a (Dr), X. Solanich^a (Dr), J. Dorca^a (Pr), S. Santos^a (Pr), G. Suárez-Cuartin^a (Pr)

^a Hospital Universitari de Bellvitge, L'Hospitalet De Llobregat, ESPAGNE

BACKGROUND: COVID-19 patients can develop severe pneumonia causing respiratory failure. Lung histological samples were scarce due lack of autopsies. We aimed to correlate histological COVID19 features with radiological findings through Lung Ultrasound (LU)-guided postmortem Core Needle Biopsies (CNB) and Computerized Tomography (CT)-scans.

METHODOLOGY: Observational prospective study including 30 consecutive severe COVID19 patients. The thorax was divided into twelve explorations regions to correlate LU and CT-scan features. Histological findings were also related to radiological features through CNB biopsies.

RESULTS: Mean age: 62.56 ± 13.27 y-o, male (96.7%). Postmortem LU-CNB were obtained in 12 patients (25 samples). 30 patients were evaluated with both thoracic LU and CT-scan, representing a total of 279 thoracic regions explored. The most frequent LU finding was B2-lines (49.1%). The most CT-scan finding was Ground-Glass Opacity (GGO, 29%). Pathological CT-scan findings were commonly observed when B2-lines or C-lines were identified through LU (PPV 87.1%). Histological samples showed diffuse alveolar damage (DAD) (75%) and chronic interstitial inflammation (25%). The observed DAD was heterogeneous, showing multiple evolving patterns: exudative (33.3%), fibrotic (33.3%) and organizing (8.3%) phases. In those patients with acute or exudative pattern, two lesions were distinguished: classic hyaline membrane; and fibrin “plug” in alveolar space (acute fibrinous organizing pneumonia, AFOP). C-profile was described in 33.3%, and presented histological signs of DAD and lung fibrosis. The predominant findings were collagen deposition (50%) and AFOP (50%). B2-Lines were identified in 66.7%; the presence of hyaline membrane was the predominant finding (37.5%), then organizing pneumonia (12.5%) and fibrosis (37.5%). No A-lines or B1-Lines were observed in these patients.

CONCLUSION: LU B2-lines and C-profile are predominantly identified in severe COVID19 patients with respiratory worsening, which correspond to different CT patterns and histological findings of DAD and lung fibrosis.

Disclosure of funding source(s):

We thank CERCA programme for the financial support.

Abstract #126

Virtual Bronchoscopic Navigation and Endobronchial Ultrasound with a Guide Sheath without Fluoroscopy for Diagnosing Peripheral Pulmonary Lesions, A Randomised Non-inferiority Trial

X. Zheng^a (Pr), L. Zhang^b (Pr), C. Zhong^c (Pr), F. Xie^a (Dr), S. Li^c (Pr), G. Wang^b (Pr), J. Sun^{*a} (Pr)

^a Department of Respiratory Endoscopy, Department of Respiratory and Critical Care Medicine, Shanghai Chest Hospital, Shanghai Jiao Tong University, Shanghai Engineering Research Center of Respiratory Endoscopy, Shanghai, CHINE ;

^b Department of Endoscopy, National Cancer Center/National Clinical Research Center for Cancer/Cancer Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing, CHINE ; ^c State Key Laboratory of Respiratory Disease, National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Health, The First Affiliated Hospital of Guangzhou Medical University, Guangdong, CHINE

Xiaoxuan Zheng, Lei Zhang and Changhao Zhong contributed equally to this research.

Background: Transbronchial sampling of peripheral pulmonary lesions (PPLs) is routinely performed under fluoroscopy. However, advanced ancillary techniques have become available, such as virtual bronchoscopic navigation (VBN) and radial endobronchial ultrasound with a guide sheath (rEBUS-GS). This study was performed to determine whether the diagnostic utility of VBN and rEBUS with a GS is similar with or without fluoroscopy.

Methods: This multicenter non-inferiority trial randomized patients with PPLs suspicious of malignancy to a VBN-rEBUS-GS group or a VBN-rEBUS-GS-fluoroscopy group at 3 centers. The bronchoscope was advanced to the targeted bronchus under VBN guidance and the rEBUS-GS was inserted to confirm the lesion, with or without fluoroscopy. The primary endpoint was the diagnostic yield, and the margin used to establish non-inferiority was -10%. The secondary endpoints were the times for rEBUS, GS, and the total operation. Complications were also recorded.

Results: 496 subjects were assessed from September 2018 to July 2019 and 436 subjects were enrolled in the study. 426 subjects were finally analyzed, 212 in non-fluoroscopy-guided group and 214 in fluoroscopy-guided group. The adjusted diagnostic yield in the non-fluoroscopy-guided group (84.6%) was not inferior to that in the fluoroscopy-guided group (84.8%), with a diagnostic difference of -0.2% (95% CI: -6.7%, +6.3%). Multivariable analysis confirmed that bronchus sign and lesion nature were valuable diagnostic predictors in non-fluoroscopy-guided group. Relative to the fluoroscopy-guided group, the non-fluoroscopy-guided group had shorter rEBUS, GS, and total operation times. No severe complications occurred in either group.

Conclusion: Transbronchial diagnosis of PPLs using VBN-rEBUS-GS without fluoroscopy is a safe and effective method that is non-inferior to VBN-rEBUS-GS with fluoroscopy. Positive bronchus sign and malignant nature are associated with high diagnostic yield in VBN-rEBUS-GS without fluoroscopy for the diagnosis of PPLs.

Disclosure of funding source(s): none

Abstract #127

The effectiveness of bronchial fistula occluder in the treatment of bronchial infection

J. Cui^{*a} (M.)

^a *Guangdong Provincial People's Hospital, Guangzhou, CHINE*

[Abstract]

Objective: to verify the effectiveness of occluder in the control of pulmonary infection in the treatment of bronchopleural fistula;

Methods: the basic situation, treatment, chest imaging examination, antibiotic use, inflammatory index changes and other indexes of patients with bronchopleural fistula diagnosed in Guangdong Provincial People's Hospital from 2012 to 2022 were collected. The patients were divided into routine treatment group and occluder data group to evaluate the pulmonary imaging control, inflammatory index changes, hospital stay and cost.

Results: 22 cases of bronchopleural fistula were collected; In terms of treatment, 8 cases (36.4%) were treated with occluder, 11 cases (50%) were treated with conventional conservative treatment, and 3 cases (13.6%) were treated with other treatment methods such as biological glue, valve and operation. There were 18 cases (81.8%) of bronchopleural fistula complicated with infection, 16 cases (72.7%) of pneumothorax, 18 cases (81.8%) of pleural effusion, 7 cases (31.8%) of sputum culture, 8 cases (36.4%) of bronchial flushing fluid culture and 8 cases (36.4%) of pleural effusion culture. After inserting the occluder, chest imaging improved, pneumothorax absorbed and pleural effusion decreased, $P < 0.05$. The inflammatory indexes (WBC, PCT, CRP) were significantly higher than before, $P < 0.05$. The length of stay was shorter than that of the routine treatment group, but the cost was higher than that of the routine treatment group.

Conclusion: the treatment of bronchopleural fistula with occluder is helpful to control pulmonary infection, pneumothorax absorption, improve inflammatory indexes, shorten hospital stay, but increase medical expenses.

Key words: occluder, bronchopleural fistula, infection

Disclosure of funding source(s): none

Abstract #128

Computed tomography (CT)-guided percutaneous combined with microwave ablation and 125I seed implantation for the treatment of advanced and metastatic lung cancer

DH. Chen^a (Mlle), B. Cai^b (Dr), J. Chen^c (Dr), X. Xu^d (Mlle), SX. Li^c (Mlle), B. Yuan^e (Pr), RD. Xu^f (Pr), J. Li^g (Pr)

^a Baiyun Branch of Nanfang Hospital, Guangzhou, CHINE ; ^b Dali university, Dali, Yunnan, China., Yunnan, CHINE ; ^c Department of Pulmonary and Critical Care Medicine, Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences. Guangzhou, Guangdong, China., Guangzhou, CHINE ; ^d 4. Department of Pulmonary and Critical Care Medicine, Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences. Guangzhou, Guangdong, China., Guangzhou, CHINE ; ^e Department of Pulmonary and Critical Care Medicine, The First People's Hospital of Yunnan Province. The Affiliated Hospital of Kunming University of Science and Technology, Kunming, Yunnan, China, Kunming, CHINE ; ^f Department of Comprehensive interventional Oncology, Guangdong Provincial People's Hospital, Guangdong Academy of Medical Sciences. Guangzhou, Guangdong, China., Kunming, CHINE ; ^g Department of Pulmonary and Critical Care Medicine, The First People's Hospital of Yunnan Province. The Affiliated Hospital of Kunming University of Science and Technology, Kunming, Yunnan, China., Kunming, CHINE

Objective: To investigate and analyze the clinical efficacy of CT guided microwave ablation (MWA) combined with ¹²⁵I seed implantation in the treatment of lung malignancies.

Methods: Records of Forty-four patients, who were followed up for advanced or metastatic lung cancer treated with MWA or MWA combined with 125I seed implantation from January 2015 to December 2020 in Guangdong Provincial People's Hospital, were retrospectively reviewed, 28 patients were treated with MWA (MWA group) and 16 patients were treated with MWA combined with 125I seed implantation (Combined group). The recent outcomes, complications, Karnofsky score (KPS), survival and factors associated with survival were compared between the two groups of patients.

Results: The effective rate was 21.43% in the MWA group and 56.25% in the combined group, $P < 0.05$; The complication rate was 46.43% in MWA patients and 62.50% in combined group, $P > 0.05$; KPS score was lower than before treatment in both groups ($P < 0.05$) after treatment in one month. KPS score in combined group was higher than before treatment in this group after treatment in three months, and also much higher than MWA group scores in the same period ($P < 0.05$). The combined group showed higher median survival time than MWA group (32.00 (14.749,49.251) vs 12.009 (9.273,14.727) months respectively ; $P < 0.05$) . The factors associated with survival were subjected to Cox regression, which the protective factors were treatment modality [HR=0.400, 95% CI (0.849,0.957), $P=0.048$] and preoperative KPS [HR=0.902, 95% CI (0.85049, 0.957), $P=0.001$].

Conclusion: CT-guided MWA combined with 125I seed implantation is safe and effective in the treatment of advanced and metastatic lung cancer, which can control its progression and prolong survival time.

Disclosure of funding source(s):

This research was supported by The Major Science and Technology Special Program Fund of Yunnan Biomedical Special Program (No.:202102AA100012).

Abstract #129

Preliminary data on cryobiopsy performed with ultrathin bronchoscopy in the diagnosis of peripheral lung lesions suspected of malignancy

E. Tagliabue^{*a} (Dr), T. Aloe^a (Dr), IMG. Piroddi^a (Dr), F. Scifio^a (Dr), S. Garuti^a (Dr), M. Bellotti^a (Dr), M. Grosso^a (Dr), E. Barisione^a (Pr)

^a IRCCS Ospedale Policlinico San Martino, Genova, ITALIE

The management of non-small cell lung cancer has become increasingly complex in the background of personalized medicine approach. The bronchoscopic cryobiopsy (CB) is a recent technique that has proved its rule in the diagnosis of both endobronchial and peripheral lung tumours (1). In our center we used CB performed with the Ultra-Thin bronchoscopy (UT) with fluoroscopic guide (2). It can allow higher diagnostic rate and a superior quality of the collected samples for histopathological and molecular diagnosis of lung cancer. (3)

This are preliminary data of 13 patients with suspected peripheral lung cancer who underwent CB with UT (March-December 2021). Of these 13 patients (mean age 74.6 years), 3 were female; 2 of them were active smokers, 3 stopped smoking , 3 never smoked. For the 5 remaining no medical history was available. Seven patients had a clinical oncological history. Before bronchoscopy, all patients were studied with contrast-enhanced chest CT. 4 were characterized as pulmonary opacities, while of the remaining peripheral lesions 3 were masses and 6 were nodules.

The diagnostic yield of CB was 84,6% with histological diagnosis. 9 patients were diagnosed with lung cancer (adenocarcinoma: 4; squamous-cell carcinoma: 1; NSCLC-not other specified: 1; mucoepidermoid carcinoma: 1; carcinoid: 1). One patient was diagnosed with non-Hodgkin lymphoma and one patient with organized pneumonia and two patients' samples were not diagnostic. Pneumothorax occurred in only one case, and only one patient had mild bleeding. In adenocarcinoma samples immunohistochemical analysis was performed.

CB in association with UT allows collection of large and nearly intact tissue samples, improving the diagnostic rate, facilitating the measurement of multiple biomarkers and making histologic diagnosis quicker (4). Patient enrolment is ongoing during this new year.

1.DOI: [10.1097/MCP.0000000000000848](https://doi.org/10.1097/MCP.0000000000000848)

2.DOI:[10.21037/jtd-2020-abpd-001](https://doi.org/10.21037/jtd-2020-abpd-001)

3.DOI: [10.1155/2013/730574](https://doi.org/10.1155/2013/730574)

4.DOI: [10.3390/ijms22052625](https://doi.org/10.3390/ijms22052625)

Disclosure of funding source(s): none

Abstract #130

Effects of Tiotropium on airway remodeling in patients with early stage COPD accessed by EB-OCT

ZQ. Zhou^{*a} (Dr), SY. Li^a (Pr), NS. Zhong^a (Pr)

^a *The 1st affiliated hospital of Guangzhou medical university, Guangzhou institute of respiratory health., Guangzhou, CHINE*

Background: It's still not clear whether use of long-acting bronchodilators be beneficial in early-stage COPD patients to decelerate airway remodeling. We aim to investigate the effects of Tiotropium on airway remodeling in GOLD I COPD patients. **Method:** We enrolled 71 patients with GOLD I COPD who were randomize divided into 3 groups. Patients in Group 1 (n=24) received Tiotropium 18 μ g once daily and SABA as need (T+S) during 24 months treatment period. Patients in Group 2 (n=24) received T+S during the first 12 month, and SABA as needed from the 12 to 24 months. Patients in Group 3 (n=23) receive SABA as needed during the 24 months treatment period. EB-OCT was performed to access airway remodeling at month 0, 12, 24. Pulmonary function test was performed every 3 months. **Results:** Baseline characteristics and baseline airway parameter access by EB-OCT were similar among three groups (All $P > 0.05$). Tiotropium resulted in a significantly larger airway inner luminal area (Ai) than baseline in medium-sized ($7.31 \pm 3.91 \text{mm}^2$ v.s. $10.06 \pm 4.66 \text{mm}^2$, P

Disclosure of funding source(s): none

Abstract #131

Anlotinib inhibits the benign airway stricture scar tissue by regulating YAP

X. Zheng^a (Mlle), Y. Cheng^{*a} (Dr)

^a *Department of Respiratory and Critical Care Medicine, The Third Affiliated Hospital, Southern Medical University, Guangzhou, CHINE*

Background: Benign tracheal stenosis is prone to recurrence due to the proliferation of granulation scar tissue, making tracheal stenosis a clinical problem. Therefore, there is a need to find a new method for the treatment. **Objective:** To investigate the inhibitory effect of anlotinib on tissue formation and fibroblast proliferation in airway scar tissue. **Methods:** *In vivo:* The model of tracheal stenosis was established by scratching the airway in rats with a nylon brush. Anlotinib or normal saline was administered for 7 days. The rats were sacrificed on the 14th day after the operation and the trachea was removed. HE staining was used to observe the scar tissue. *In vitro:* human lung fibroblasts (MRC-5 cells) with/without anlotinib treatment or TGF- β induction, were used. The ability of proliferation and migration of MRC-5 were detected by CCK-8 and cell scratch assays. The protein expression level of Collagen I was detected by western blot and the nucleoplasmic localization of YAP by cell immunofluorescence assay. **Results:** *In vivo:* Compared with the normal saline group, the granulation scar tissue reduced after anlotinib treatment. *In vitro:* (1) Compared with the TGF- β alone group, anlotinib inhibited the proliferation of fibroblasts. (2) Compared with the TGF- β alone group, the anlotinib group inhibited the migration of fibroblasts. (3) Compared with TGF- β alone group, the expression of Collagen I decreased in anlotinib group. (4) Compared with the control group, TGF- β promoted the nuclear translocation of YAP. Compared with the TGF- β alone group, the anlotinib group inhibited the nuclear translocation of YAP. **Conclusion:** Anlotinib can attenuate the formation of benign airway stricture scar tissue and inhibit TGF- β -induced fibroblast proliferation, migration and up-regulation of extracellular matrix protein expression, which may be achieved by inhibiting YAP nuclear translocation. To provide a new option for the treatment of benign airway stenosis.

Disclosure of funding source(s): none

Abstract #132

For Patients Undergoing Bronchoscopy Under General Anesthesia, How Long Can They Eat After Operation?

YH. Zhang*^a (Pr)

^a *The First People's Hospital of Yunnan Province, Kunming, CHINE*

Background: In order to avoid aspiration due to anesthesia of the throat, doctors generally recommend that patients undergoing diagnostic flexible bronchoscopy under general anesthesia eat 6 hours after operation. However, according to our experience, many patients eat 2 hours after operation without aspiration.

Methods: The clinical data of patients undergoing diagnostic flexible bronchoscopy under general anesthesia in the Department of respiratory and critical medicine of the first people's Hospital of Yunnan Province from February 1, 2022 to March 31, 2022 were analyzed retrospectively. These patients ate 2 hours after operation.

Results: A total of 582 patients were included in the study, 297 males and 285 females. These patients began to eat 2 hours after general anesthesia, and there was no aspiration.

Conclusion: For patients undergoing diagnostic flexible bronchoscopy under general anesthesia, eating 2 hours after operation will not lead to aspiration.

Disclosure of funding source(s): none

Abstract #133

Research on the Value of Confocal laser microendoscopy combined with frozen lung biopsy in the Diagnosis of interstitial lung disease

C. Zuo^a (Dr), M. Ke^{*a} (Pr)

^a *The Second Affiliated Hospital of Xiamen Medical College, Xiamen, CHINE*

Background Transbronchial Frozen Lung Biopsy (TBCB) has become a minimally invasive alternative to surgical lung biopsy (SLB) due to its low cost and low trauma, but it still has a high rate of pathologic negative diagnosis and complications. Confocal laser microendoscopy (CLE) is a high-resolution optical imaging technique. Compared with traditional fluoroscopy, it has no radiation and is expected to be a tool to assist TBCB precise and effective operation.

Objectives By comparing the efficacy and safety of TBCB combined with CLE group and fluoroscopy group in the diagnosis of ILD, the application value of CLE assisted TBCB in ILD diagnosis was discussed.

Methods In this prospective controlled study, 60 ILD patients with unknown diagnosis who were hospitalized in the Second Affiliated Hospital of Xiamen Medical College from December 2020 to April 2022 and who needed lung biopsy were included. Based on the basic information of TBCB, the patients received CLE or fluoroscopy randomly. The positive pathological diagnosis rate, specimen size, operation time, complications and the coincidence rate of images and pathological diagnosis were compared between the two groups.

Results The positive rate of pathological diagnosis was found 92% in CLE group and 78% in fluoroscopy group ($p < 0.005$), Biopsy specimen size (11.6 ± 5.8) and (11.6 ± 5.8) mm² ($p > 0.005$), Operation time (36.2 ± 12.8) and (51.6 ± 14.2) minutes ($p < 0.005$), The incidence of pneumothorax zero ratio (0/30) and 6.7% (2/30) ($p < 0.005$), Incidence of major bleeding 3.3% and 10.0% ($p < 0.005$), respectively. The coincidence rate of CLE group images and pathological diagnosis was 93.3%.

Conclusions CLE images have a strong correlation with ILD etiology spectrum, can not only guide TBCB precise biopsy, improve the positive pathological diagnosis rate, but also reduce major bleeding and pneumothorax, shorten the operation time and avoid radiation, which has high clinical application value.

Keywords CLE; ILD; TBCB; value

Disclosure of funding source(s):

The project is a university-level science and technology project of Xiamen Medical College, project number: K2020-02, funded by Xiamen Medical College

Abstract #135

Late-onset giant bullae and pneumothorax following COVID-19 pneumonia with severe ARDS

I. Nurrasyidah^{*a} (Dr), A. Madargerong^a (Dr), D. Rahmawaty^b (Dr), E. Kusumawardhani^a (Dr)

^a Pulmonology Department, Faculty of Medicine, Lambung Mangkurat University, Banjarmasin, INDONÉSIE ; ^b Faculty of Medicine, Lambung Mangkurat University, Banjarmasin, INDONÉSIE

Background: Patients with Corona Virus Disease 2019 (COVID-19) may develop bullae that can rupture into spontaneous pneumothorax (SP) during the diagnosis and treatment, which can be a predictor of poor prognosis. However, late-onset bullous disease and SP after recovering from COVID-19 is unusual. In order to improve clinicians' understanding and treatment of the disease, we summarized the clinical characteristics of the disease.

Case Report: Our patient was a 48-year-old male presented with sudden shortness of breath accompanied by chest pain that occurs when coughing or changing positions. Three weeks earlier, the patient had finished treatment in the COVID-19 isolation room for 20 days with a diagnosis of COVID-19 pneumonia with severe ARDS, and he still complained of non-productive cough. On physical examination showed tachypnea and desaturation, on the right hemithorax there was decreased tactile fremitus, decreased vesicular breath sounds, and hyperresonance to percussion. CT scan showed a right pneumothorax with infected subpleural giant bullae in right perihilar, right lung collapse, minimal right-to-left lung herniation and post-covid pulmonary fibrosis. The patient then received high flow oxygenation therapy and a chest tube was placed for the management of pneumothorax. Subsequently, the patient was treated with antibiotics according to the results of culture and antibiotic sensitivity. On the 36th day of treatment, the CT scan finally showed no bullae and right lung expansion compared to the previous CT scan. The patient showed clinical and radiological improvement following 41 days of treatment and managed as an outpatient.

Conclusion: Our patient was diagnosed with infected giant bullae and pneumothorax post COVID-19 pneumonia with severe ARDS. The patient did not undergo a bullectomy with consideration of the post-COVID-19 condition and was managed conservatively with an adequate chest tube and antibiotics.

Keywords: Pulmonary bullous disease, pneumothorax, late-onset, COVID-19

Disclosure of funding source(s): none

Abstract #136

Adequacy of peripheral lymph nodes specimens for proper lung cancer (LC) characterization

M. Marc Malovrh^a (Dr), J. Šrajner^b (M.), A. Rozman^c (Dr)

^a University clinic Golnik, Golnik, Slovenia, SLOVÉNIE ; ^b Medical Faculty Ljubljana, Ljubljana, SLOVÉNIE ; ^c University clinic Golnik, Golnik, SLOVÉNIE

Background. In patients with metastatic LC obtaining accurate specimen for full cancer characterization is crucial for optimal choice of systemic treatment. Our aim was to find out how sufficient were easily accessible peripheral lymph node (PLN) specimens in providing the diagnosis and predictive biomarkers testing.

Methods. We retrospectively analysed 85 patients with LC who had PLN puncture (with or without ultrasound -US guidance) as the first invasive diagnostic procedure in three year period at University Clinic Golnik (2018-2021). In 32 patients puncture of palpable PLN without US guidance, and in 53 patients US guided PLN puncture was performed (in 27 of them with cytological and in 26 with histological needle). The decision when the predictive tests were performed was accepted according to the current guidelines. Among mutations, EGFR and KRAS were tested first (PCR), if both negative, tests for ALK (IHC), and in case of negative ALK test, NTRK, ROS1 (FISH) or BRAF (PCR) followed.

Results. Samples obtained by palpable PLN puncture provided adequate material for treatment decision in 50% cases, molecular tests were possible for PDL1 in 48%, EGFR and KRAS in 52.1%, ALK in 38.9% and ROS1, NTRK, BRAF in 33.3%. US guided PLN puncture by cytological needle was sufficient for treatment decision in 70.4% of patients, for PDL1 in 63.6%, EGFR, KRAS in 61.1%, ALK, ROS1, NTRK, BRAF tests in 33.3%. US PLN puncture by histological needle was sufficient for treatment decision in 57.7% of patients, for PLD1 in 50%, for EGFR, KRAS in 52.9%, ALK, ROS1 in 42.9%, NTRK and BRAF tests in 30%. No complications due to PLN puncture were reported.

Conclusions. Metastatic PLN puncture provided sufficient material for treatment decision in more than half of patients. Our results further show superiority of cytological puncture with US guidance compared to the other two techniques.

Disclosure of funding source(s): none

Abstract #137

Application of digital virtual endoscopy in bronchial obstruction

文. 郭^a (M.), 佳. 王^a (Mlle), 梦. 张^a (Mlle), 晶. 刘^a (Mlle)

^a 湖南医药学院, 鹤城区, CHINE

Objective to explore the application value of digital virtual endoscopy in bronchial obstruction.
Methods to explore the application value of three-dimensional reconstruction of pulmonary bronchi and analog digital virtual endoscopy in patients with bronchial obstruction.
Results three-dimensional reconstruction of digital virtual endoscope model conclusion Digital virtual endoscopy can assist preoperative planning, rehearsal and improve the effect of surgical treatment.

Disclosure of funding source(s): none

Abstract #138

Role of bronchoscopic interventions in the management of patients with tuberculosis related airway complications

S. Goyal^{*a} (Dr), A. Jindal^a (Dr), K. Kumar^a (M.), D. Dutt^a (M.), J. Khan^a (M.)

^a *Artemis Hospitals, Gurugram, INDE*

Background:

Tuberculosis (TB) is one of the most concerning infectious diseases and a leading cause of morbidity plus mortality worldwide; specially in endemic regions like India. We hereby present our experience of case scenarios to assess role of bronchoscopic interventions in management of airway complications secondary to tuberculosis.

Methods:

Total of fifteen (n=15) patients who presented over a period of 18 months to a tertiary care medical center at North India with TB related airway complications were included. They underwent bronchoscopic interventions including balloon dilatation, stent placement, electrocautery, holmium laser resection, debulking of tumourous endobronchial TB, argon plasma coagulation (APC), cryotherapy, amplatzer ASD closure device insertion, bronchial blocker and endobronchial watanabe spigot (EWS) insertion. Post procedure follow up period was 12 months.

Results:

Bronchoscopic interventions provided early improvement clinically and radiologically in more than 90% of patients. Five patients presented with tracheobronchial stenosis; four after dilatation underwent stent placement (1: Silicone; 3: SEMS), whereas one patient only underwent balloon dilatation. Two patients had endobronchial debulking procedure; one with rigid bronchoscope other with APC probe. In two patients with TB related tracheo-oesophageal fistulae (both found unfit for surgery): one was managed with fully covered SEMS and other with an ASD closure device. Three patients with secondary bronchopleural fistulae (BPF); after leak localisation had undergone EWS insertion bronchoscopically. Out of 3 patients with active haemoptysis; two were managed with cryotherapy and in other bronchial blocker followed by bronchial artery embolisation (BAE). No procedural complications noted and most patients had good results on follow up apart from one who developed extensive granulation tissue around SEMS.

Conclusion:

Bronchoscopic interventions are useful, less invasive and more feasible than surgery for management of TB related airway complications and sequelae. This modality should be utilised as adjunct to an adequately dosed, complete anti-TB treatment short course.

Disclosure of funding source(s): none

Abstract #139

The effectiveness of percutaneous blind pleural biopsy in the era of modern biopsy techniques (pleuroscopy, VATS) - the experience of the university clinical center in the developing country

A. Zecevic^{*a} (Dr), B. Ilic^b (Dr), S. Popevic^b (Dr), M. Grujic^a (Dr), M. Omcikus^b (Dr)

^a Clinic for Pulmonology, University Clinical Center of Serbia, Belgrade, SERBIE ; ^b Faculty of Medicine, University of Belgrade, Clinic for Pulmonology, University Clinical Center of Serbia, Belgrade, SERBIE

Introduction: Exudative pleural effusion is the most common manifestation of various lung and pleura infections, as well as primary or secondary malignancies involving the pleura. Percutaneous pleural biopsy represents the first line in the differential diagnosis of the etiology of pleural disease, in patients in whom thoracentesis did not give a definitive answer.

Methods: We performed a retrospective study, in which we included patients who underwent percutaneous pleural biopsy in our center between July 2020. and March 2022. We analysed the effectiveness of this procedure, regarding clarifying the definitive etiology of pleural effusion, as well as additional diagnostic procedures, if they were necessary.

Results: In that period, in the Clinic for Pulmonology, University Clinical Center of Serbia, that is the largest pulmonological center in our country, a percutaneous pleural biopsy was performed on a total of 135 patients with exudative pleural effusion. Malignant tumor as a cause of pleural effusion was found in 61 (45.2%) cases, of which primary lung tumors 42 (31.1%), malignant mesothelioma 10 (7.4%), and tumors of other origins 9 (6.7%). In 7 cases, there was the tuberculous pleuritis (5.2%). In 14 of 67 patients (10.4%) the diagnosis was made by one of the other methods (bronchoscopy 5, VATS biopsy 6, EGDS biopsy 2, pericardiocentesis 1). Twenty-seven patients died before any other diagnostic procedure or didn't come to the control examination. In 10 patients, the primary tumor of another localization (outside of the lung or pleura) was radiographically verified, or they already had a history of malignancy.

Conclusion: Given the significant differences in cost, safety, the extent of necessary training of medical staff, and also 50.4% sensitivity, percutaneous biopsy still has significant use in diagnosing the etiology of pleural effusion, especially in the developing countries, where diagnostic procedures like pleuroscopy and VATS are often unavailable.

Disclosure of funding source(s): none

Abstract #140

Endobronchial ultrasonogram analysis of 3 cases with benign central airway stenosis.

P. Chen^a (Mlle), J. Li^{*a} (Pr), X. Li^a (Mme)

^a *Guangdong Provincial People's Hospital, Guangzhou, CHINE*

Background

Endobronchial ultrasonography (EBUS) allows visualization of the internal structure of the tracheobronchial wall. Currently EBUS technology is available in two forms: radial and linear transducer probes, i.e. the miniprobe and the ultrasound endoscope. Radial miniprobe has a 20-MHz or 30 MHz rotating transducer that can be introduced into the bronchi through the working channel with dimension >2.6mm of a flexible bronchoscope. The tip of the probe contains a rotating piezoelectric crystal inside a water-filled balloon, which produces a 360° image to the long axis of the bronchi.

Case report

3 patients suffered from central airway stenosis due to bronchial tuberculosis in our hospital were female, aged from 19 to 37 years. Chest CT showed atelectasis of the left lung. Bronchoscopy showed severe stenosis and scar tissue formation of the left main bronchus. Balloon dilatation was performed. After operation, the stenosis was obviously improved, and the bronchoscope was successfully passed. Radial endobronchial ultrasonography was performed within (3-5) days after balloon dilatation. All the lesions in 3 patients were involved in the left main bronchus. Compared with the normal left main bronchus, EBUS images showed thickening of the wall, narrowing of the lumen, unclear boundary between mucosa and submucosa, thickening of the submucosa with hypoecho, and complete cartilage layer. Because the cartilage layer was not damaged, the stent was not placed. The left main bronchus maintained its shape when underwent bronchoscopy within 3 weeks and 3 months after operation. No airway collapse was found by bronchoscopy.

Conclusion

EBUS shows the layered structure of airway wall lesions. The ultrasonic image of central airway stenosis due to bronchial tuberculosis is characterized by thickening of the wall, especially in submucosa. Patients with incomplete cartilage layer may require stent placement.

Disclosure of funding source(s): none

Abstract #141

Bronchoscopic cryobiopsy for interstitial lung disease: Our experience in a tertiary centre, Slovenia

V. Dimitric^a (M.), M. Marc Malovrh^a (Dr), K. Adamic^a (Mme), A. Rozman^{*a} (Dr), T. Nemanic^a (Mme)

^a *University Clinic Golnik, Golnik, SLOVÉNIE*

Background: The correct diagnosis of the interstitial lung disease can be challenging and requires multidisciplinary team approach. Integral part of the diagnostic process is the histological examination of the lung tissue sample which can be obtained using cryobiopsy technique.

Methods: In our study, we retrospectively observed 94 patients in the years from 2016 to 2019. All patients had previously been assessed by a multidisciplinary medical consultation team that indicated bronchoscopic cryobiopsy. After receiving the histological diagnosis, the patients were presented anew, with the aim of determining the final diagnosis.

Results: 94 patients were included in the study, thereof 57 men (61%) and 37 women (39%), with the average age of 66 years (36-80). Following the assessment to the multidisciplinary medical consultation team, a final diagnosis was determined for 90 patients, of which 4 required a VATS biopsy. In 10 patients (10.6%) pneumothorax occurred; 6 required pleural drainage, 4 only observation. There were 6 (6.4%) major, 27 (28.7%) moderate and 61 (64.9%) minor incidences of bleeding. One patient had paroxysmal atrial fibrillation.

Conclusion: Bronchoscopic cryobiopsy is an accessible and, in experienced hands, safe diagnostic method, with which we can acquire suitable histological material needed for the final diagnosis of interstitial lung disease. According to our experiences, it represents a good alternative to open surgical lung biopsy.

Disclosure of funding source(s): none

Abstract #143

Routine Surveillance Bronchoscopy At First-Month In Lung Transplantation Recipients - A One Year Single Center Experience Analysis

A. Crutu^{*a} (Dr), A. Hanna^a (Dr), V. De Montpréville^a (Dr), V. Florea^a (Dr), P. Pradere^a (Dr), S. Feuillet^a (Dr), G. Dauriat^a (Dr), J. Le Pavec^a (Dr), E. Fadel^a (Pr)

^a *Marie Lannelongue Hospital, Le Plessis-Robinson, FRANCE*

Background: Bronchoscopy with transbronchial biopsy (TBBX) remains the current “gold standard” for the diagnosis of the acute cellular rejection (ACR), which represents one of the most important risk factors for the chronic allograft dysfunction. Therefore, the early detection of asymptomatic ACR episodes may play a role in its prevention. The aim of our study was to identify the number of ACR detected in routine surveillance bronchoscopy (SB).

Methods: In our center we perform a routine SB with TBBX at first-month after lung transplant for all asymptomatic patients. The lung transplant recipients can have, at any time, a clinically indicated bronchoscopy (CB). We performed a retrospective analysis of the data concerning the patients that had lung transplant during the calendar year of 2021. The bronchoscopy procedures performed at first-month post-transplant were analysed and the number of ACR was recorded.

Results: In 2021, 40 bilateral lung transplant (LTx) were performed in our center. Sex distribution was 19 (47.5%) males and 21 (52.5%) females. 5 patients were excluded from the analysis (no bronchoscopy procedure performed at first-month for 4 of them and non-contributively bronchoscopy procedure for one patient). 19 bronchoscopy procedures were routine SB at first-month post-transplant. 12 of them (63.15%) found pathologic changes associated with ACR. In all these cases therapeutic changes were made. 16 bronchoscopy procedures were CB. 9 of them (56.5%) found ACR. The overall complication rate was low and no death was reported in relation with the procedure.

Conclusion: In our experience the information obtained by the SB at first-month post-transplant influenced the therapeutic management in a significant number of cases. In the literature the role of SB remains controversial and there is no consensus on the frequency in which we should be performing it. An adequately powered prospective randomized controlled study comparing SB to CB is required.

Disclosure of funding source(s): none

Abstract #145

Fibulin-3 in plasma and pleural effusion as a biomarker of pleural mesothelioma

K. Adamič^{*a} (Dr), A. Rozman^a (Pr), M. Marc Malovrh^a (Pr)

^a *University Clinic of Respiratory and Allergic Diseases Golnik, Golnik, SLOVÉNIE*

Background:

Patients with asbestos related pleural involvement may develop mesothelioma with a long latency period. Pleural mesothelioma has a poor prognosis due to poor response to currently known treatments and also because patients are often detected in the advanced stage of the disease. According to reports, with the help of fibulin-3 in plasma and pleural effusion, it is possible to distinguish patients with mesothelioma (even in the initial stage of the disease) from those with benign or malignant pleural effusion of other etiology. The purpose of our study was to examine the potential of plasma and pleural fibulin-3 as a biomarker of mesothelioma.

Methods:

The prospective study included patients with exudative pleural effusion who underwent thoracoscopy between January 2013 and October 2014 at University Clinic Golnik. At the time of thoracoscopy blood and pleural effusion samples were obtained, in which the concentration of fibulin-3 was determined by enzyme-linked immunosorbent assay (USCN Life Science). Patients with malignant pleural involvement were followed to death, patients with benign or non-specific results were followed for at least three years.

Results:

Of the 90 patients, mesothelioma was confirmed in 32, pleural carcinosis in 24, and benign pleural disease in 34 patients, of which in 13 pleural involvement was due to asbestos exposure. We found significantly lower serum fibulin levels in patients with benign asbestos related pleural involvement compared to patients with pleural mesothelioma ($p < 0.02$), carcinosis ($p < 0.03$) and other benign diseases ($p < 0.05$). Despite the trend of lower pleural fibulin values in benign diseases compared to malignant ones, the difference was not statistically significant.

Conclusion:

Lower values of serum fibulin-3 in benign asbestos related pleural involvement compared to mesothelioma suggest the possible role of this biomarker in guiding the diagnostic decisions in these patients and enabling the recognition of mesothelioma in early stages.

Disclosure of funding source(s): none

Abstract #146

Idiopathic lymphocytic pleuritis - a case report

B. Ilic^{*a} (Dr), D. Maric^a (Dr), S. Popevic^a (Dr), M. Grujic^b (Dr), A. Zecevic^b (Dr)

^a Faculty of Medicine, University of Belgrade, Clinic for Pulmonology, University Clinical Center of Serbia, Belgrade, SERBIE ; ^b Clinic for Pulmonology, University Clinical Center of Serbia, Belgrade, SERBIE

Introduction: Lymphocytic pleuritis most often occurs as a part of other diseases and conditions such as tuberculosis, malignancies, systemic connective tissue diseases or post-coronary artery bypass graft surgery. Diagnosis of pleural effusion often requires a multidisciplinary approach and diagnosis of idiopathic pleuritis is made only after the exclusion of all known etiological causes.

Case report: We present a case of a male patient, 46 years old, without previous chronic diseases, who came to our department due to a dry cough and increased fatigue that lasts for about 6 months. The chest X-ray showed bilateral pleural effusion, which was confirmed by MSCT of the chest, where massive bilateral pleural effusion, diffuse thickening of the parietal pleura and a small pericardial effusion were observed. Diagnostic thoracentesis initially obtained 1500 ml of serous effusion, biochemical characteristics of exudate, cytological findings are predominantly lymphocytes and mesothelial cells, no malignant cells were observed. Bacteriological and mycobacteriological analysis of effusion were negative. Extensive additional non-invasive diagnostics were then performed, which excluded immune disease, hematological/lymphoproliferative disease, tuberculosis. Bronchological examination excluded any pathological process in the tracheobronchial tree. A percutaneous biopsy of the parietal pleura was performed, followed by VATS thoracoscopy, and the pathohistological findings showed diffuse lymphocytic infiltration of the parietal pleura, excluded hematological disease and IgG4-related disease. Based on the performed diagnosis, it was concluded that it is most likely idiopathic lymphocytic pleuritis. Prednisone therapy was started with 40 mg daily with a gradual dose reduction. After 6 months of therapy there was a complete regression of pleural effusion, and the patient was referred to a regular control regimen.

Conclusion: Idiopathic lymphocytic pleuritis is a rare, immunosuppressant-responsive form of this disease and the diagnosis is made by excluding the known causes of this disease.

Disclosure of funding source(s): none

Abstract #147

Adequacy of EBUS-TBNA specimens for accurate therapeutic decision

T. Nemanic^{*a} (Mlle), J. Srajner^a (M.), V. Dimitric^a (Mme), M. Marc Malovrh^a (Dr)

^a *University Clinic of Respiratory and Allergic Diseases Golnik, Golnik, SLOVÉNIE*

Background. EBUS-TBNA is due to minimal invasiveness and high accuracy an important diagnostic tool in patients with lung cancer (LC). Beside the role in mediastinal staging, it can also provide accurate molecular characterization of non-small cell LC in majority of patients with nonresectable or metastatic disease. Our aim was to find out the accuracy of EBUS-TBNA lymph node specimens, obtained from our patients, for a full assessment including immunohistochemistry (IHC) and molecular tests when indicated.

Methods. We retrospectively analysed 78 patients with LC in whom EBUS-TBNA of lymph nodes was performed as a diagnostic procedure from 2019-2021 at University Clinic Golnik. The decision which molecular tests were needed was made according to the current guidelines. Among mutations, EGFR and KRAS were tested first (PCR), if both negative, tests for ALK (IHC), and in case of negative ALK test, NTRK, ROS1 (FISH) and BRAF (PCR) followed.

Results. The final diagnosis was small cell LC in 17, adenocarcinoma in 47, squamous cell carcinoma in 5 and non-determined non-small cell LC in 6 patients. EBUS-TBNA was diagnostic in 75 (96.2%) patients, and provided adequate tissue for PD-L1 testing in 79.2%, EGFR and KRAS in 96.2%, ALK in 84.6%, ROS1 in 92%, NTRK in 88%, BRAF in 81.5% of specimens in which selected testing was indicated. In 14 (17.9%) patients further procedure for optimal therapeutic decision was needed.

Conclusion. Our data show that EBUS-TBNA provided adequate specimens for therapeutic decision in majority of patients (82.1%), with high success rates in mutational status detection, and a place for improvement in adequacy of samples for PD-L1 assessment.

Disclosure of funding source(s): none

Abstract #148

First report of endoscopic spray cryotherapy use in the treatment of severe vocal fold leukoplakia.

M. Orestes^a (Dr), S. McKay^a (Dr), D. Morrison^a (Dr), C. Conlon^a (Dr), R. Browning^a (Pr)

^a *Walter Reed National Military Medical Center, Bethesda, ÉTATS-UNIS*

Background

Vocal fold leukoplakia is a common syndrome that results in deficits in phonation and breathing that negatively impacts an individual's quality of life and has the potential for malignant transformation if left untreated. Current treatments are often not effective and painful. SCT uses a medical device that delivers liquid nitrogen to the surface tissue through a flexible 7 Fr catheter (trūFreeze®, Steris, U.S.A.). While this device has been used to treat benign and malignant disease in the airways and subglottis since 2012 (Browning et. al. J Thorac Dis 2013), use for vocal fold disease has been very limited. Recent research suggests that cryotherapy has antifibrotic and regenerative effects on human vocal fold fibroblasts (Gong et. al. Laryngoscope. 2019).

Case Report

72 y/o male with history of sinonasal Wegener's granulomatosis (GPA) on chronic immunosuppression and progressive vocal fold hyperkeratosis and leukoplakia since 2006 requiring repeat laser ablation (KTP and CO2). Patient experienced prolonged post procedural pain with minimal improvement in symptoms. Using suspension laryngoscopy and delivered through a bronchoscope with a 2.8 mm working channel, SCT was used to treat the areas of widespread hyperkeratosis on the patient's bilateral vocal folds with 3 cycles of 10 seconds freeze per cycle. To better target the smaller areas of the vocal folds, the low flow (versus normal flow) setting was primarily used to achieve a smaller spray diameter on the target tissue resulting in good coverage of the target tissue. The patient reported improved phonation and no post procedural pain compared with prior ablations. Repeat laryngoscopy at 3 months showed reduced hyperkeratosis.

Conclusion

This case report illustrates potential benefits of spray cryotherapy on this benign vocal fold disease that includes decreased post operative pain and possibly improved healing profile versus standard thermal therapies.

Disclosure of funding source(s): none

Abstract #149

Uncommon case of hemoptysis in child Dr. Di Blasio Andrea, Dr. Boailchuk Ivanna Children Hospital Ricardo Gutierrez - Respiratory Endoscopy Department South America, Argentina

AV. Di Blasio^a (Dr), I. Boailchuk^a (Dr)

^a RICARDO GUTIERREZ CHILDREN HOSPITAL, Buenos Aires, FRANCE

A two years old boy from the north of Argentina, previously healthy, with diagnosis of pneumonia of upper left lobe was admitted to Children Hospital, Ricardo Gutierrez because of hemoptysis. Discarding TBC and other regional illness, in early chest computed tomography shows consolidation in left upper lobe, ground glass opacities. In the period of non bleeding, efficient videobronchoscopy navigate through the airways shows ingurgitation and remodeling pulmonary venules in main bronchus, in right upper lobe (B1), left upper and lower lobe (LUL; B6). Hemodynamic, Angio tomography and cardiovascular tomography features with low risk pulmonary hypertension, pulmonary venous stenosis, with severe stenosis near by left atrium. Biopsy of apical left lobe and lower left lobe presents proliferation of capillaries into alveolar walls, interlobular septa, pulmonary interstitium and pleura, confirmed with CD34 pulmonary capillary hemangiomatosis/veno occlusive disease. It is a rare entity, with a few cases in the literature. At his 8 years old, living ordinary life in his home, makes this case report the only one known and it is not following the common pattern of this rare pathology. The natural evolution of this illness is severe pulmonary hypertension and dead. No definitive treatment include lung transplantation and angiogenesis inhibitors, meanwhile treatment are in progressive improvement.

Conclusion: Hemoptysis is an infrequent and severe symptom in childhood. Video bronchoscopy in non bleeding period, has an invaluable rate of diagnosis of pulmonary pathology and in this particular case, an important tool to aim at Veno occlusive disease.

Bibliography:

Pulmonary capillary haemangiomatosis in a premature infant - [Cicero J T A Silva](#) - 2005 Jun
Congenital pulmonary capillary hemangiomatosis in a newborn, [Sandra L Sposito Cavallo](#), 2017 Feb
Pulmonary veno-occlusive disease, [David Montani](#), [Edmund M Lau](#); 2016 May

Disclosure of funding source(s): none

Abstract #150

Chest X ray radioscopy, a great alliance with bronchoscopy in complex cases of foreign bodies aspiration. Dra. Di Blasio Andrea V. - Dra Boailchuk Ivanna Ricardo Gutierrez Children Hospital - Respiratory Endoscopy Department. Argentina

AV. Di Blasio^a (Dr), I. Boailchuk^a (Dr)

^a RICARDO GUTIERREZ CHILDREN HOSPITAL, Buenos Aires, ARGENTINE

Foreign body aspiration is a common event in children, and can lead to significant morbimortality. Most frequently in under 3, with immature anatomical and physiological structure, in addition to the easy access to small element to play, in spite of parents' care. Is recommended a rapid clinical examination diagnosis, with or without complementary methods, for the extraction. In Children Hospital Ricardo Gutierrez, mostly extraction are with a rigid bronchoscopy technic under general anesthesia, using indicate tool for each. In a particular case, a 2-year-old patient, was admitted to the emergency department because of an event a week before, of aspiration foreign bodies, and severe respiratory symptoms. With poor information in a chest x ray, rigid bronchoscopy was performed and the foreign body in main right bronchus was an irregular rounded with smooth edge stone. It was 2 cm long and almost 2 cm wide. No manual nippers were adequate to take the stone out of the patient airway. We use radioscopy and foley catheter. The technique consists in placing the Foley's balloon passing by the stone. Radioscopy as a method to locate the correct position of the balloon, using radiopaque substance to fill it. Inflated Foley's balloon making it like a stopper to carry the stone back. The image was monitored and filmed with the traditional x ray radioscopy. Conclusion: Rare foreign body aspiration required bronchoscopy to resolved. But sometimes may require different and unusual techniques, to achieve the extraction. In spite of an old method, chest x ray radioscopy with radiopaque substance is a perfect tool to work jointly with bronchoscopy for a successful result.

Tracheobronchial aspiration of foreign bodies and rigid bronchoscopy in children, [Murat Oncel](#), 2012 Aug

Radiodensity on serial chest X-rays for the diagnosis of foreign body aspiration in children, [Eun Song Song](#), 2015 Aug

Disclosure of funding source(s): none

Abstract #151

Case report of multi-purpose indwelling pleural catheter for complex hydropneumothorax with empyema as a bridge to novel targeted therapy.

S. Mckay^a (Dr), P. Mullenix^a (Dr), E. Briggs^a (Dr), R. Cooper^a (Dr), R. Browning^{*a} (Pr)

^a *Walter Reed National Military Medical Center, Bethesda, ÉTATS-UNIS*

Background

The most common indication for indwelling pleural catheters (IPC) is relief of dyspnea in malignant pleural effusions. In some cases, IPCs not only provide improvement in quality of life but also allow more time for additional treatment. The development of a new targeted treatment for KRAS positive NSCLCA that was previously thought to be “untargetable” highlights the value extending survival as a bridge to new therapies.

Case Report

A 56 year old female with stage IVb adenocarcinoma (KRAS positive) who presented with a large right upper lobe cavitary tumor encompassing the entire upper half of the right thorax and a very complicated pleural space with a malignant pleural effusion and a collapsed RLL. Stent was placed in the RMB to open the RLL and IPC was placed using guidewire, ultrasound and fluoroscopy to drain the dependent and apical loculated pleural effusions. Over the next 18 months, the IPC was simultaneously used to manage not only the malignant pleural effusion but a chronic slowly expanding pneumothorax likely from an alveolopleural fistula (APF) from the apex of the RUL cavity after radiation and initial tumor response to therapy as well as a pseudomonal empyema that was treated with IV antibiotics and daily drainage from the IPC. During this time, the patient continued immunotherapy/chemotherapy followed by Docetaxel and Ramucirumab all with progression of disease within the lung and bones. In July of 2021 she was one of the first patients to receive Sotorasib C2 off trial. She experienced a dramatic response and remains clinically improved now 10 months later.

Conclusion

Indwelling pleural catheters can strategically be placed using ultrasound and fluoroscopic imaging in very complex pleural spaces and managed to treat multiple pleural complications encountered in advanced lung cancer patients and act as a bridge to newer therapies.

Disclosure of funding source(s): none

Abstract #152

Pediatric bronchoscopy usefulness in the context of the covid-19 pandemic in an Andean country

ME. Arauz Martinez^a (Dr), R. Rios-Mendez^a (Dr), R. Yora Orta^a (Dr)

^a HOSPITAL PUBLICO PEDIATRICO BACA ORTIZ, Quito, ÉQUATEUR

Introduction: Pediatric bronchoscopy (PB) is very useful in pulmonology, during the covid-19 pandemic limits high aerosolization procedures including bronchoscopy being used in absolutely necessary emergency or urgent situations.

Materials and methods: Descriptive cross-sectional studies were carried out on pediatric patients. These procedures were performed with flexible fiberoptic bronchoscopy 3.5 and 5.5; and rigid bronchoscopy from 2.5 to 5.5 in diameter, in addition to rigid and flexible foreign body extraction forceps, the procedures were during the covid-19 pandemic at the Baca Pediatric Hospital Ortiz.

Results: From February 2014 to March 2022, a total of 794 rigid and flexible bronchoscopy procedures have been performed by an interventional pulmonology operator. During the most critical hospital period of the pandemic from March 2020 to July 2021, when operating room spaces were limited, 65 pediatric endoscopies were performed. The age range: 2 months to 16 years, with a weight range of 3 to 65 Kg. The prevalence of emergency bronchoscopy was 46.15% (30 patients), airway obstruction being the most frequent cause with 21 patients (three with positive SARS-COV2 and Cystic fibrosis) and 9 minors with airway stenosis moderate to severe pediatric: subglottic stenosis and tracheal stenosis. The prevalence of urgency bronchoscopy was 53.84% (35 patients), with foreign body aspiration being the highest rate with 16 children, having two patients with positive Covid-19 and foreign body in the airway, following in prevalence bronchoalveolar lavage in children with compromise 12 patients and 7 children with hemoptysis. The most rescued germ in bronchoalveolar lavage cultures was *Pseudomonas aeruginosa*. The complication was reported in 2 patients: laryngospasm and subcutaneous emphysema.

Conclusions: The BP were procedures safe realized in emergency and urgency diagnosis during the covid-19 pandemic

Bibliography:

1. <https://neumoped.org/wp-content/uploads/2019/05/2014-Libro-Broncoscopia-312p.pdf>
2. https://www.scielo.cl/scielo.php?script=sci_serial&pid=0717-7348&lng=es&nrm=iso

Disclosure of funding source(s): none

Abstract #153

Identification of potential genes in endobronchial tuberculosis after bronchoscopic cryotherapy by transcriptome sequencing

Y. Zhou^a (Dr)

^a Xi'an Chest Hospital, Xi'an, Shaanxi, CHINA

Background: Bronchoscopic cryotherapy facilitates the treatment of endobronchial tuberculosis (EBTB) and helps suppress progressive bronchial stenosis. However, the molecular mechanism of bronchoscopic cryotherapy in EBTB patients has not been reported. **Methods:** Transcriptome sequencing was performed to explore differentially expressed mRNAs (DEGs) in EBTB patients before and after bronchoscopic cryotherapy. Gene Ontology (GO) and KEGG analyses were carried out. Five genes (MKLN1, HIGD1A, PTGES, SKIL, and MCEMP1) were selected and validated using real-time qPCR (RT-qPCR). **Results:** In transcriptome analysis, 448 DEGs with $p < 0.05$ and $|\log_2 FC| > 1$ were identified; of these, 171 and 277 DEGs were significantly up- and down-regulated after bronchoscopic cryotherapy, respectively. Results displayed 337 biological process (GO-BP), 48 cellular component (GO-CC) and 62 molecular function (GO-MF) terms and 20 KEGG pathways. RT-qPCR results were consistent with the sequencing data. **Conclusion:** These data provide informative evidence and recommendations for further scientific research on bronchoscopic cryotherapy for EBTB.

Disclosure of funding source(s):

This study is supported by Xi'an Municipal Bureau of Science and Technology [20YXYJ0001(4)].

Abstract #154

Using The Chartis System To Guide Endobronchial Valve Placement For The Treatment Of Persistent Air Leak: Case Series

Z. Noori^a (Dr), R. Imel^a (Dr), M. Omballi^a (Dr)

^a *University of Toledo, Toledo, ÉTATS-UNIS*

Background:

Persistent air-leak (PAL) is caused by alveolopleural fistula (APF) that lasts more than 5-7 days. PAL is associated with significant morbidity and prolonged hospitalization. Management includes prolonged chest catheter placement, surgical repair, and pleurodesis. One-way endobronchial valves (EBVs) have been used to treat PAL. Several methods are used to localize APF including balloon occlusion, air insufflation and Methylene blue injection. Measurement of the negative pressure distal to the occlusion balloon using the Chartis system offer a more accurate way to identify the location of an APF.

Methods:

This is a case series of six patients at a teaching hospital who underwent EBVs placement for PAL from March 2021 to February 2022. We used the Chartis system to identify the target lobe or segment. We reported the etiology of the pneumothorax, duration of chest catheter drainage, hospital length of stay, number and locations of EBVs deployed.

Results:

Five patients were males (n=5). Four patients had secondary spontaneous pneumothorax. Two patients had PAL following lobectomy and wedge resection. The mean number of valves placed per patient was about 4 (range, 2-5). Valves were placed in the left upper lobe (n=10), right lower lobe (n=5), right middle lobe (n=2), right upper lobe (n=3). The mean duration of air leak prior to valve placement was 25.5 days (range, 7-72 days). The mean time to the resolution of air leak and chest tube removal was 6 days (range, 3-11 days). Air leak resolved in all six patients.

Conclusion:

Balloon occlusion, the most common method used to localize APF cannot be used when air-leak disappears upon induction of anesthesia. Air insufflation is not helpful when the procedure is performed under positive pressure ventilation. The Chartis system helps accurately identify the APF site and overcome the shortcomings of the other methods.

Disclosure of funding source(s): none

Abstract #155

A First for Robotic Navigational Bronchoscopy and the Use of “Tele-ROSE” in diagnosing lung pathology

S. Saha^{*a} (Dr), S. Joshi^a (Dr), A. Ronghe^a (Dr), J. Tomaszewski^a (Dr), R. Zambrano^b (M.)

^a *University of Buffalo: School of Medicine, Buffalo, ÉTATS-UNIS* ; ^b *Kaleida Health System, Buffalo General Hospital, Buffalo, ÉTATS-UNIS*

Background:

In diagnosing malignancy or lung pathology, the adequacy of tissue specimens are ideally assessed with ROSE (rapid onsite evaluation) and a cytopathologist. When institutions are shortstaffed, we must become creative in this age of telemedicine. Telecytology, first noted by Raab et. Al (1996), utilized a Sony video camera to project images on a monitor, and examine the diagnostic accuracy in cervical smears. Bott et. al (2015) fitted a Nikon camera to a microscope, connected to another video controller, for live real time video during a mediastinal staging EBUS. Lin et. al (2019) performed ROSE on thyroid samples using the same setup as Bott et al., where images were streamed via a proprietary platform to another off-site pathologist’s workstation. We are presenting a pilot study as the first instance where telecytology is being utilized in navigation robotic bronchoscopies in identifying peripheral lung lesions.

Methodology:

38 suspected patients with targetable lung lesions were evaluated with a navigation bronchoscopy/EBUS. 11 patients utilized telecytology ROSE, 9 of which utilized a robotic navigation system. The slides were prepared and streamed in real time using a Leica Flexacam C3 with an Olympus BX43 Microscope, over the Webex video conferencing platform. A secure hospital internet connection allowed the pathologist, at an outlying facility, assess for adequacy. Our endpoint was measuring the time to calling a specimen for adequacy.

Results:

Prior to the implementation of telecytology, it took on average 18 minutes to call adequacy (n=27 patients). Using telecytology, the time to call for adequacy was 8 minutes (n=11 patients).

Conclusion:

TeleROSE may become a new standard platform for assessing adequacy of biopsies in institutions that may not have in-house pathology. This setup reduces anesthesia time, expensive licensing fees for proprietary platforms, and may help other institutions trying to develop their own thoracic oncology programs.

Disclosure of funding source(s): none

Abstract #156

A Rare Complication of Hepatopulmonary Syndrome after a Fontan Cardiac Surgery

C. Fernandez^{*a} (Dr), S. Saha^a (Dr)

^a *University of Buffalo: School of Medicine, Buffalo, ÉTATS-UNIS*

Background

The Fontan procedure was first performed in 1971, and has been used to treat congenital heart defects involving a single ventricle. Performed by Frances Fontan and Eugene Baudet, an anastomosis is created directly to the pulmonary artery from the right atrium, bypassing the ventricle, allowing for systemic venous blood flow into the lungs. This rare procedure is performed for less than 0.02% of live births per year. Known pulmonary risks associated with this procedure include the development of pulmonary AVMS and plastic bronchitis. Fontan associated liver damage (FALD) includes hepatic fibrosis and hepatocellular carcinoma. However, there are only 6 Fontan cases that suffered from hepatopulmonary syndrome (HPS) as a complication (Choi et al 2009). We present the seventh case thus documented.

Case report

26-year-old female history of coarctation of the aorta, hypoplastic left heart status post Fontan procedure at Day 2 of life; was admitted for acute hypoxic respiratory failure and decompensated liver cirrhosis. Symptoms included chronic clubbing of her digits, LE edema, abdominal pain, ascites, central and peripheral cyanosis. Labs revealed elevated ALP, bilirubin and secondary polycythemia. CT imaging showed a right pleural effusion, portosystemic venous shunt, esophageal and inferior epigastric varices, dilated sub-pleural pulmonary vessels concerning for AVMs. Echocardiogram revealed endocardial cushion defect and dilated right ventricle. Peritoneal fluid was positive for SBP, and pleural fluid was positive for spontaneous bacterial pleuritis. Patient was treated with antibiotics and evaluated for possible transplant.

Conclusion

There is limited data in the development of HPS status post-Fontan surgery. Rodriguez et al (2018) suggests an increased risk of mortality in those with HPS, and a correlation between mortality and disease severity of HP. Given there is an overlap of HPS, PPHTN (portopulmonary hypertension), and FALD; this case serves to highlight the complexity of managing similar patients.

Disclosure of funding source(s): none

Abstract #157

Airway dehiscence following silicone stent implantation for stenosis post lung transplantation, a rare complication.

A. Hanna^{*a} (Dr), A. Crutu^a (Dr), P. Baldeyrou^a (Dr), D. Mitilian^b (Dr), D. Fabre^b (Pr), J. Le Pavec^a (Dr), E. Fadel^b (Pr)

^a *Interventional bronchoscopy unit, Department of Pulmonary medicine and Lung Transplantation, Marie Lannelongue Hospital., Le Plessis Robinson, FRANCE* ; ^b *Department of Thoracic, Vascular Surgery and Heart-Lung Transplantation, Marie Lannelongue Hospital., Le Plessis Robinson, FRANCE*

Case presentation:

Here we present a case of a 47 years old female patient, with double-lung transplantation for pulmonary hypertension secondary to scleroderma. She developed 5 months after transplantation multiple airway stenosis. Five sessions of bronchoscopic dilatations were done with successful silicon stent 10x20 mm implantation of the left main bronchus.

At day 11 after stenting, she presented with shortness of breath, tachypnea, fever and was hospitalized in the ICU due to septic shock with respiratory distress syndrome. Blood sample showed: Leucopenia 0.9 g/l, hyponatremia 128mg/L, kalaemia 3.5mmol/L, CRP 522mg/l. Blood gases showed a compensated metabolic acidosis. CT scan showed atelectasis of the left lower lobe with multiple bilateral pulmonary infiltrates. The patient was then intubated and mechanically ventilated. Fluid resuscitation, vasopressors, inotropes together with antimicrobial were instated.

Fiberoptic bronchoscopy showed perfectly positioned stent in the left main bronchus. BAL was positive for a pseudomonas aeruginosa treated with antimicrobials.

Patient was extubated after sepsis control, then referred to our center for assessment. A new CT scan was done showing multiple bilateral excavated lung nodules and an 18 mm donor's left main stem diameter. Fiberoptic bronchoscopy showed left main bronchus stent floating in the airway with necrosis of the donor's bronchus, leading to stent ablation. Bronchial aspiration revealed aspergillus fumigatus and pseudomonas aeruginosa that were treated accordingly. Bronchoscopic surveillance showed healing stenotic left main bronchus which was then dilated.

Conclusion:

Airway stenosis is the most common airway complication following lung transplantation. The management is usually dilatation and stenting. Airway dehiscence after stenting is a rare complication. We attribute dehiscence in this case to the septic shock and the role of vasopressors in reducing airway blood flow at an early stage of the post transplantation period.

Disclosure of funding source(s): none

Abstract #158

Management of airway dehiscence post lung transplantation a case series.

A. Hanna^{*a} (Dr), A. Crutu^a (Dr), P. Baldeyrou^a (Dr), D. Fabre^b (Pr), O. Mercier^b (Pr), J. Le Pavec^a (Dr), E. Fadel^b (Pr)

^a *Interventional bronchoscopy unit, Department of Pulmonary medicine and Lung Transplantation, Marie Lannelongue Hospital., Le Plessis Robinson, FRANCE* ; ^b *Department of Thoracic, Vascular Surgery and Heart-Lung Transplantation, Marie Lannelongue Hospital., Le Plessis Robinson, FRANCE*

Introduction:

Airway dehiscence increases the mortality and morbidity and impacts the outcome of transplantation in this population. We will hereby present a case series of airway dehiscence management following lung transplantation.

Case presentation:

Case 1:

A 46 years old patient who had a double-lung transplantation for idiopathic pulmonary hypertension. Five weeks after transplantation she developed a necrosis with dehiscence of the donor's left main bronchus. CT chest showed a loss of left main bronchus integrity. Bronchoscopy and successful left main bronchus stenting using a covered metallic stent 12x40 mm. Patient was weaned from mechanical ventilator few days later and stent was removed 7 weeks later.

Case 2:

A 51 years old patient who developed a bilateral airway dehiscence 8 weeks post double-lung transplantation. CT chest showed loss of integrity of the two main bronchus. Fiberoptic bronchoscopy revealed bilateral incomplete dehiscence. Successful bilateral airway stenting using a covered metallic stent (12x30 mm) for the left main bronchus, and (12x20 mm) for the right main bronchus. Successful weaning few days later and stents removed 8 weeks later.

Case 3:

A 46 years old patient who had a double-lung transplantation complicated with a right pleuro esophageal fistula, surgically repaired. She then developed a bilateral complete airway dehiscence. The left bronchial dehiscence was surgically repaired, while the right was endoscopically managed using a covered metallic stent 12x20 mm. She developed a complete atelectasis of the left lower lobe due to a punctiform bronchus. Successful covered metallic stent 8x15 mm of the left lower lobe. The right bronchus stent was removed 6 weeks later and the left 5 months after.

Conclusion:

Airway dehiscence following lung transplantation is a challenging complication to manage. Management as airway stenting and redo surgery if indicated should be discussed on a case by case basis, and needs a multidisciplinary approach.

Disclosure of funding source(s): none

Abstract #159

Peripheral airway bronchoscopy using a combination of thin/ultrathin bronchoscopes, radial endobronchial ultrasound and 2D fluoroscopy

A. Sadoughi^a (Pr), S. Virdi^a (Dr), D. Schecter^a (Dr), S. Synn^a (Dr), C. Christine^a (Dr)

^a *Albert Einstein College of Medicine - Montefiore Medical Center, New York City, ÉTATS-UNIS*

Background:

Diagnosis of peripheral lung lesions is still a challenge despite development of different technologies. Miniaturized bronchoscopes are reported to increase diagnostic yield (DY) by improving visualization of small caliber airways.

Methods:

This is a cohort study of patients referred for peripheral lung lesion. We routinely use thin bronchoscope with the guide of radial endobronchial ultrasound (rEBUS) and 2D fluoroscopy. If the lesion is not localized with a concentric rEBUS view or the tip of the scope is far from the lesion, we use ultrathin bronchoscope [3.0 mm outer diameter at tip and 1.7 mm working channel]. Sampling tools include needle, forceps, brushing and bronchoalveolar lavage. Successful bronchoscopy is defined as either detection of a malignant, infection or inflammatory disease which can explain the clinical scenario. If none of the above are achieved, the lesions are followed either by surgical or transthoracic biopsy or at least 12 months radiological surveillance.

Results:

121 patients were referred for bronchoscopy from March 2019 to January 2021. 126 peripheral lung lesions were studied. The mean of the longest diameter of the lesions was 2.69 cm and the median was 2.2 cm (range 0.7 to 7.4 cm). Diagnosis was made in 106 lesions (DY 84%). 62 out of 72 patients with final diagnosis of malignancy were diagnosed via bronchoscopy (sensitivity 86%). Localizing the lesion was successful in 124 (98%) cases and concentric rEBUS view was found in 118 (95%) cases. There was only one patient with pneumothorax post procedure, and there was no major complication.

Conclusion:

Combination of thin and ultrathin bronchoscopes with rEBUS and 2D fluoroscopy surveillance during peripheral airway bronchoscopy provides diagnostic yield comparative to CT-scan guided sampling. The high rate of success with low costs and complication rates makes this approach favorable for diagnosis of small and hard to reach lung lesions.

Disclosure of funding source(s): none

Abstract #160

Analysis of the clinical efficacy and safety of bronchial thermoplasty in the treatment of patients with severe asthma and asthma-chronic obstructive pulmonary disease overlap

S. Hu^a (Mlle), F. Long^{*a} (Pr), P. Fu^a (M.)

^a University of Chinese Academy of Sciences Shenzhen Hospital, Shenzhen, CHINE

Objective To explore whether bronchial thermoplasty (BT) is safe and effective in treating severe asthma and asthma-chronic obstructive pulmonary disease (COPD) overlap. **Methods** We retrospectively enrolled 49 ACO cases receiving BT and 50 severe asthma cases undergoing BT at University of Chinese Academy of Sciences Shenzhen Hospital from January 2016 to December 2018. Cases were divided into overlapping and Asthma groups. Their baseline data were recorded. Lung function, hormone consumption, Asthma Control Test ACT, Asthma Quality of Life Questionnaire (AQLQ), Asthma Control Questionnaire (ACQ), and chronic obstructive pulmonary disease assessment test (CAT) and Modified British Medical Research Council (mMRC) scores, and adverse reactions 3-week post-treatment were comparatively analyzed. **Results** Overlapping group had an older age, longer smoking history and disease course, higher pre-treatment lung function indexes FVC, FEV₁, and FEV₁% pred, but lower inhaled hormone dosage than asthma group ($P_s < 0.05$). No differences were in pre-treatment ACT, ACQ, and AQLQ scores ($P_s > 0.05$). At 3-month post-treatment, FEV₁% pred and inhaled hormone dosage in overlapping group were not improved ($P_s > 0.05$), while others were better than pre-treatment ($P_s < 0.05$). At 1-year post-treatment, all indicators significantly improved than pre-treatment, with asthma group having better effects ($P_s < 0.05$). Overlapping group had higher cough and blood sputum rates within 3-week post-treatment than asthma group, whereas excessive sputum and short-term wheezing rates decreased ($P_s < 0.05$). Differences in chest tightness, chest pain, segmental atelectasis and pneumonia were significant ($P_s > 0.05$), and postoperative adverse reactions were effectively controlled shortly. **Conclusion** BT improves lung function and life quality in asthma patients and those with COPD, with higher effects on asthma patients and no serious adverse events.

Disclosure of funding source(s): none

Abstract #161

The Macklin Effect in Recurrent Spontaneous Pneumomediastinum in Systemic Lupus Erythematosus & COVID19

S. Soniwala^a (Dr), C. Fernandez^a (Dr), Y. Perry^a (Dr), J. Lang^b (Dr), S. Saha^a (Dr)

^a University of Buffalo: School of Medicine, Buffalo, ÉTATS-UNIS ; ^b Buffalo General Hospital, Buffalo, ÉTATS-UNIS

Background

Spontaneous pneumomediastinum (SPM) is defined as the presence of free air in the mediastinum, with no clear traumatic etiology. Interestingly found in 1% of Covid related cases (Chen et al 2020). The Macklin effect, described in 1939, refers to centripetal alveolar rupture causing free air to track along the bronchovascular sheaths towards the hilum of the lung and into the mediastinum (Murayama 2014). With SPM seen in the setting of COVID, there are a few case reports correlated to immunosuppression. We describe the first case of the Macklin effect in a patient with systemic lupus erythematosus (SLE) and prior COVID.

Case report

A 38 year-old male with a history of SLE and COVID-19 was admitted for respiratory failure. CT imaging showed pneumomediastinum with subcutaneous emphysema tracking up to the orbital regions. The patient was discharged on steroids and antibiotics, and improved briefly. After 1 month, he returned with worsening dyspnea, cough, and pneumomediastinum. EGD was unremarkable for an esophageal perforation. Bronchoscopy revealed severe tracheomalacia, but no airway defects. Bronchoscopic cultures were positive for MSSA, and he was started on broad spectrum antibiotics given the dense bilateral pulmonary infiltrates. Repeat CT imaging was significant for developing bilateral pneumothoraces and air migrating along the broncho-vascular bundles around both hila, with air tracking into the mediastinum. The patient eventually developed a large left pneumothorax, requiring chest tube placement, and eventual intubation with low tidal volume, low PEEP, and high FiO₂.

Conclusion

This case illustrates the importance of being aware of complications such as SPM in post covid patients, who are immunocompromised, particularly with SLE. Complications can range from benign, such as pneumorrhachis, to severe respiratory failure (Murayama 2014). As the Macklin effect is not commonly identified, this is a case to bring to the forefront of our clinical minds.

Disclosure of funding source(s): none

Abstract #162

Mounier Kuhn bronchoscopic and radiological findings.

A. Hanna^{*a} (Dr), Y. Uzunhan^b (Pr), A. Girault^c (Dr), D. Mitilian^c (Dr), H. Mal^d (Pr), J. Le Pavec^a (Dr), G. Dauriat^a (Dr)

^a *Interventional bronchoscopy unit, Department of Pulmonary medicine and Lung Transplantation, Marie Lannelongue Hospital., Le Plessis Robinson, FRANCE* ; ^b *Avicenne hospital, Bobigny, FRANCE* ; ^c *Department of Thoracic, Vascular Surgery and Heart-Lung Transplantation, Marie Lannelongue Hospital., Le Plessis Robinson, FRANCE* ; ^d *Bichat hospital, Paris, FRANCE*

Introduction:

Mounier-Kuhn syndrome, is a rare clinical and radiologic condition characterized by marked tracheobronchial dilation and recurrent lower respiratory tract infections. It is characterized by tracheobronchial dilation secondary to atrophy of the muscular and elastic tissues in the trachea and main bronchial walls. Diagnosis is established with computed tomography (CT) confirmed by bronchoscopy, as well as pulmonary function testing.

Case presentation:

A 32 years old female patient followed up for a Mounier Kuhn syndrome. She was referred to our center for lung transplantation evaluation. CT scan showed tracheobronchomegaly, 40mm tracheal diameter and 85 mm for the left main bronchus (Fig: 1,2), multiple tracheal diverticula mainly in the posterior tracheal wall, varicose and cystic bronchiectasis extended to the distal bronchi. Fiberoptic bronchoscopy was consistent with the CT findings (Fig: 3,4,5). Pulmonary function test: FVC 63% 2180mL, FEV1 42% 1270mL, FEV1/FVC 58%, TLC 99% 4840mL, RV 191% 2760mL, DLCO 48%, KCO 68%.

Discussion and conclusion:

Mounier-Kuhn syndrome is secondary to a thinning of the muscular mucosa and atrophy of the longitudinal muscle and elastic fibers of the tracheobronchial tree. As a consequence, tracheal diverticulosis and dilatations in the posterior membranous wall appear, along with bronchiectasis that tend to be cystic in appearance. Overall, there is an impairment of mucociliary clearance, with an ineffective cough, which predisposes the patient to recurrent lower respiratory tract infections.

Three subtypes were described in literature: type 1 with subtle symmetrical dilation of trachea and major bronchi; type 2 with more obvious dilation and eccentric diverticula; type 3 with diverticula that extend to the distal bronchi. Treatment ranges from respiratory physiotherapy for airway clearance to endobronchial stenting in severe cases. Lung transplantation is not technically possible due to absence of bronchial airway required for the anastomosis.

Disclosure of funding source(s): none

Abstract #163

Surgical and functional outcomes following resection of benign laryngotracheal stenosis.

A. Hanna^{*a} (Dr), A. Nauta^b (Dr), D. Mitilian^b (Dr), A. Crutu^a (Dr), O. Mercier^b (Pr), E. Fadel^b (Pr)

^a *Interventional bronchoscopy unit, Department of Pulmonary medicine and Lung Transplantation, Marie Lannelongue Hospital., Le Plessis Robinson, FRANCE* ; ^b *Department of Thoracic, Vascular Surgery and Heart-Lung Transplantation, Marie Lannelongue Hospital., Le Plessis Robinson, FRANCE*

Methods:

We evaluated all patients operated for BSLTS, between January 2007 and November 2018. Post-operative assessment was conducted by flexible bronchoscopy at day 1 and 7, clinical and endoscopic evaluation at 1 month, and if necessary at 3 and 6 months. We analyzed 30-day mortality, overall complications and success rates. Late surgical outcomes included restenosis and mortality. Functional outcomes and quality of life were assessed by questionnaires (Visual Analogic Scale (VAS), modified Medical Research Council for dyspnea, VAS for swallowing, Voice Handicap index (VHI)).

Results:

Of the 194 patients who underwent tracheal surgery, 43 were operated for benign laryngotracheal stenosis: 28 with a “modified Pearson technique” and 15 with “Grillo’s intervention”. A laryngeal release was performed in 15 cases (32%). Thirty-day death, overall complications and success rates were 0%, 44%, and 95%, respectively. Late surgical outcome data (mean follow-up 53 months) were available for 38 patients (88%). There were 7 (18%) restenoses and 36 (95%) late surgical successes. Thirty-four patients (79%) responded to functional questionnaires. There was a significant diminution of mean postoperative dyspnea VAS scores during rest (-5.4 (±4.2)) and activity (-5.6 (±4.8)) ($p < 0.001$), a trend toward decreased mMRC grade after surgery ($p = 0.057$) (65% postoperative grade 0). According to VHI scores, 30 patients (88%) had no to moderate voice impairment and 4 (12%) experienced severe impairment. Finally, 85% of patients ($n = 29$) felt an improvement in their quality of life. Improved quality of life was significantly associated with: lower post-operative dyspnea VAS score during rest ($p < 0.01$) and exercise ($p < 0.01$); lower mMRC grade ($p = 0.012$) and lower VHI score ($p = 0.01$).

Conclusion:

In the management of BSLTS, laryngotracheal resection with primary end-to-end anastomosis is safe and provides excellent surgical and functional outcomes leading to improvement in quality of life. It should be considered as the best curative treatment for BSLTS.

Disclosure of funding source(s): none

Abstract #164

Diagnostic effect of fungal G test with bronchoalveolar lavage fluid on pulmonary fungal infection

M. Zhao^a (Dr), S. Yang^a (Dr), J. Li^{*b} (Dr)

^a Department of pulmonary and Critical Care Medicine, Guangdong provincial people's hospital, Guangzhou, CHINE ;

^b Department of pulmonary and Critical Care Medicine, Guangdong provincial people's hospital, Guangzhou, 510080, China, Guangzhou, CHINE

Background: In order to enhance the accuracy of pulmonary fungal infection diagnosis, the level of (1-3)- β -D glucan in serum has been used in clinical work to assist in the fungal infection diagnosis. However, as a diagnostic test, serum fungal (1-3)- β -D glucan has the characteristics of poor diagnostic sensitivity and specificity. At the same time, it is unclear if the (1-3)- β -D glucan level in bronchoalveolar lavage fluid through fiberoptic bronchoscopy is more accurate in diagnosing pulmonary infection.

Methods: A retrospective study was performed in Guangdong Provincial People's Hospital from January 1, 2018 to December 31, 2021, with the cases who underwent bronchoscopic alveolar lavage due to pulmonary lesions and tested for (1-3)- β -D glucan with bronchoalveolar lavage fluid. Besides the (1-3)- β -D glucan test results, clinical data as well as their diagnosis were recorded from electronic medical record system.

Results: There were 1228 patients enrolled. Among them, 108 cases were finally diagnosed with pulmonary fungal infection. Patients with confirmed pulmonary fungal infection had significantly higher (1-3)- β -D glucan levels than patients with other diseases (189.9 ± 47.0 and 53.3 ± 4.4 pg/ml), the area under the curve (AUC) was 0.64. At the same time, 1006 of these patients were also received plasma (1-3)- β -D glucan testing, 100 patients were diagnosed with pulmonary fungal infections. Plasma (1-3)- β -D glucan was significantly elevated in patients with pulmonary fungal infection (158.2 ± 60.9 and 41.7 ± 8.0 pg/ml) compared with patients with a final diagnosis of other diseases, the AUC of plasma (1-3)- β -D glucan was 0.597.

Conclusion: We found that (1-3)- β -glucan in bronchoalveolar lavage fluid was slightly more diagnostic than plasma. Furthermore, clinical features and imaging features have to be combined to diagnose pulmonary fungal infection in the future work.

Disclosure of funding source(s): none

Abstract #165

Black metastatic pleural nodules; a case of metastatic clear cell sarcoma from a non-black sole mass

S. Kim^a (Pr), J. Ha^{*b} (Pr), H. Kim^b (Pr), J. Choi^b (Pr)

^a *The Catholic University of Korea, St. Vincent's Hospital, Suwon, CORÉE, RÉPUBLIQUE DE* ; ^b *The Catholic University of Korea, Incheon St. Mary's Hospital, Incheon, CORÉE, RÉPUBLIQUE DE*

Background

Clear cell sarcoma (CCS) is a rare soft tissue sarcoma subtype that usually develops in the deep soft tissues of the lower extremities and has features of both melanoma and soft tissue sarcoma. We report a case of clear cell sarcoma which was diagnosed by medical thoracoscopic biopsy appeared as black metastatic pleural nodules.

Case report

A 41-year-old male without any underlying disorder was admitted via emergency room for pleural chest pain and dyspnea. Multiple black colored pleural nodules, masses and thickenings were observed on medical thoracoscopy and multiple biopsies were performed. The frozen section result was malignant with black pigmentation and talc pleurodesis was done. Also, there was a non-black mass of 5cm on the sole of the left foot, so a punch biopsy was performed. The pathologic finding showed spindle cell tumor with melanocytic differentiation. EWSR1 gene translocation was positive and therefore we diagnosed this patient as a primary clear cell sarcoma metastasized to the pleura from the left foot.

Conclusion

This case was meaningful in that a very rare disease requiring differentiation from melanoma, was diagnosed by confirming black metastatic nodules by medical thoracoscopy.

Disclosure of funding source(s): none

Abstract #166

Hepato-Bronchial Fistula; a rare complication of Liver Abscess

SM¹. Husnain^{2a} (Dr), R³. Shepherd^{4a} (Pr), S. Shojaee^{5a} (Dr), SMN. Husnain^{6a} (Dr)

^a *Virginia commonwealth university, Richmond, ÉTATS-UNIS*

Background:

Acquired Hepato-Bronchial Fistula (HBF) is rare communication between Hepatic parenchyma and bronchial tree via diaphragm. It's a rare entity and less than 70 cases are described in literature¹. Unlike congenital causes, Acquired types are caused by hydatid or amebic disease of the liver, hepatic abscess, trauma, and neoplasm. Given its rarity they can be difficult to diagnose, manage and often associated with high morbidity and mortality.

Case report:

We present a 45 yo male with pancreatic neuroendocrine tumor, chronic pancreatitis and biliary obstruction s/p drainage, gastrojejunostomy. After initial diagnosis, he presented with Pyogenic liver abscesses complicated by diaphragmatic rupture and empyema requiring VATS with decortication. Later in course, patient was found to have recurrent liver abscess, beneath diaphragm resulting in septic shock. Patient had 3 drains placed for abscess. He was found to have pneumobilia on one of the follow-up imaging. A contrast study was suspicious for fistula formation between airway and drain. bronchoscopy was performed to establish the diagnosis. A 5 mL of methylene blue was injected through a hepatic drain. A visualization of dye was instantaneously seen in third generation airway of right middle lobe with direct visualization. Subsequently hepatic drain was removed and recommendation was made for fistula to be healed. Patient continued on empiric antibiotic, and did relatively well without intervention.

Conclusion:

HBF is a rare entity. Historically surgical drainage and repair have been used with little success and significant morbidity³. However this case already had drains placed and his source was controlled at the time of discovery of fistula. More importantly adequate antibiotics with definitive management biliary tract is essential⁴. CT scan, USG and MRI or direct visualization with dye injection can all be helpful and support diagnosis⁵. Careful assessment of this condition is needed if clinical suspicion is high, before therapeutic procedure⁶.

Disclosure of funding source(s): none

Abstract #167

Alveoscopic findings in critically ill COVID-19 patients

O. Danilevskaya^a (Dr), A. Averyanov^a (Pr), E. Popova^a (Dr), D. Sazonov^b (Dr), T. Klypa^b (Dr), F. Zabozaev^b (Pr), V. Lesnyak^b (Dr), E. Ilyushnikov^c (Dr), D. Panchenkov^c (Pr), M. Bychinin^b (Dr)

^a FSBI Pulmonology Scientific Research Institute under Federal Medical Biological Agency of Russia, Moscow, RUSSIE, FÉDÉRATION DE ; ^b FSBI Federal Research and Clinical Center for Specialized Types of Medical Care and Medical Technologies of the Federal Medical Biological Agency of Russia, Moscow, RUSSIE, FÉDÉRATION DE ; ^c A I Yevdokimov Moscow State University of Medicine and Dentistry of the Ministry of Healthcare of the Russian Federation, Moscow, RUSSIE, FÉDÉRATION DE

Background. Probe-based confocal laser endomicroscopy (pCLE) is a minimally invasive technique for in vivo real-time microscopic imaging of proximal and distal airways during bronchoscopy [1]. The role of pCLE or alveoscopy, has not yet been clearly established in covid-19 patients, especially correlating with HRCT data, BAL and traditional histopathology.

Methods. 15 COVID-19 positive patients were examined by HRCT, pCLE and BAL the next day after intubation. pCLE has been done in several right and left lung segments to assess tissue microstructures, in the most and the least affected zones according to HRCT. 113 bronchopulmonary zones were examined by pCLE in total.

Results. In alveolar spaces in 27% of examined zones, pCLE showed large highly fluorescent floating structures 50-240 µm. Alveolar structure exhibited increased elastin fiber thickening in 58% of the zones where alveoscopy was done, dysteletic abnormalities were found in 34% of zones. Disorganized microvessel growth was also observed in 18% of zones. 7 patients died. On autopsy in 5 patients, protein agglomerates with increased expression of surfactant-associated protein A, macrophages and desquamated alveolocytes were found in the corresponding zones with floating structures detected by pCLE. BAL was predominantly lymphocytic in 67% of patients and neutrophilic in 33%.

Conclusions. pCLE is a useful diagnostic tool and could be useful in better understanding of the phase of acute respiratory distress syndrome observed in covid-19 [2] and in making a decision about potential therapy with inhaled surfactant.

1. Thiberville L, Salaün M, Lachkar S, et al. Human in vivo fluorescence microimaging of the alveolar ducts and sacs during bronchoscopy. *J Eur Respir.* 2009;33:974-985.
2. Lesur O, Chagnon F, Lebel R, Lepage M. In vivo endomicroscopy of lung injury and repair in ARDS: potential added value to current imaging. *J Clin Med* 2019 Aug 11;8(8):1197.

Disclosure of funding source(s): none

Abstract #168

Intra-tumor and inter-tumor heterogeneity of PD-L1 expression

S. Yuichi^{*a} (Dr), W. Shin^b (Dr), M. Hiroaki^b (Dr), I. Takayuki^b (Dr), Y. Yoshikane^a (Dr), T. Nobumasa^b (Dr), S. Yoshihiko^b (Dr), I. Tomohiko^b (Dr), K. Masafumi^a (Pr), S. Yukinori^a (Pr)

^a Teikyo University School of Medicine, Tokyo, JAPON ; ^b Saitama Cardiovascular and Respiratory Center, Saitama, JAPON

Introduction The Dako PD-L1 immunohistochemistry (IHC) 22C3 pharmDx was approved by the US Food and Drug Administration, as a companion diagnostic test for pembrolizumab (Keytruda, Merck, Kenilworth, NJ, USA) in non-small cell lung cancer (NSCLC). Although increased PD-L1 expression levels can be associated with greater therapeutic efficacy of pembrolizumab, little is known about the concordance rate of PD-L1 expression between small biopsied specimen and surgically resected tumor tissue. **Methods** This was a prospective cohort study in single institute. Among surgical cases, patients with pathological nodal positive NSCLC were enrolled into this study. PD-L1 expression (22C3) was evaluated in preoperatively biopsied samples and tumor tissues from primary tumors and paired metastatic lymph nodes. All samples were formalin-fixed, and paraffin-embedded NSCLC tissues. Tumor cells which membrane exhibited complete or partial staining, were considered as PD-L1 positive. According to tumor proportion score (TPS), all samples were classified as no expression (TPS: <1%), low expression (TPS: 1-49%), or high expression (TPS: ≥50%). **Results** Primary tumors and paired metastatic lymph nodes were resected from 76 patients between August 2016 and April 2021 at Saitama Cardiovascular and Respiratory Center. Among of them, biopsied samples by preoperatively bronchoscopy were available in 18 cases. No expression was observed in 10 biopsied samples (55.6%), in 8 primary tumors (44.4%), and 11 metastatic lymph nodes (61.1%). Low expression was found in 6 biopsied samples (33.3%), in 4 primary tumors (22.2%), and 6 metastatic lymph nodes (33.3%). High expression was scored in 2 biopsied samples (11.1%), in 6 primary tumors (33.3%), and one metastatic lymph nodes (5.6%). The concordance rate was 0.389. **CONCLUSIONS** It is an important issue for physicians which tissue should be taken for treatment option, and further study is strongly expected to investigate it.

Disclosure of funding source(s):

Saitama Cardiovascular and Respiratory Center Grant (Number: 17ET, 18ET, 19ET, 20ET and 21FV)

Abstract #169

Bronchoscopic Removal of A Leech in The Trachea

YH. Zhang^{*a} (Pr)

^a *The First People's Hospital of Yunnan Province, Kunming, CHINE*

Background : The tracheal leech infestation is a relatively rare cause of hemoptysis. The extraction of the leech attached to the respiratory tract is not always easy , not only because of its slippery body surface which can easily be ruptured, but also due to its important link power. According to previous literature reports, the leech should be removed by rigid bronchoscopy under general anesthesia. Our case shows that the leech can be safely removed by the flexible bronchoscope under local anesthesia if cryotherapy was used.

Case Report: A 74-year-old man presented to our hospital with complaints of haemoptysis, cough and pharyngeal discomfort for 45 days. The patient came from rural area and had a history of drinking unboiled water from streams. On examination, there were no abnormal findings. Routine haematological and coagulation analysis were normal. Chest computed tomography revealed soft tissue shadow in the upper trachea. The flexible bronchoscopy was performed under local anesthesia. It revealed a brown worm-like moving foreign body attaching to the upper trachea approximately 2 cm below the glottis. The worm was removed safely in one piece via cryotherapy by flexible bronchoscope. It was identified as a leech, measured about 4 cm and was mobile. Repeat bronchoscopy revealed no bleeding and blood clots in the trachea. The symptoms were improved obviously after removal of the leech. One week after discharge, by telephone follow-up, the patient did not complain of discomfort.

Conclusion: Intrabronchial cryotherapy by bronchoscope might be the best way of extraction of leeches, and it can be performed under local anesthesia.

Disclosure of funding source(s): none

Abstract #170

Systematic Endoscopic Staging of Mediastinum to determine Impact on radiotherapy for locally advanced lung Cancer (SEISMIC): interim results from a prospective multicentre interventional study.

D. Steinfors^a (Dr), D. Ost^b (Pr), K. Yasufuku^c (Dr), J. Annema^d (Pr), L. Crombag^d (Dr), B. Jennings^e (Dr), D. Fielding^f (Dr), P. Nguyen^g (Dr), S. Yo^e (Dr), K. Rangamuwa^a (Dr), P. Lee^b (Dr), Y. Shi^h (Dr), J. Simpson^h (Pr), G. Kothariⁱ (Dr), N. Hardcastleⁱ (Dr), S. Sivaⁱ (Dr)

^a Royal Melbourne Hospital, Melbourne, AUSTRALIE ; ^b The University of Texas, MD Anderson Cancer Center, Houston, ÉTATS-UNIS ; ^c Toronto General Hospital, Toronto, CANADA ; ^d University of Amsterdam, Amsterdam, PAYS-BAS ; ^e Monash Health, Melbourne, AUSTRALIE ; ^f Royal Brisbane and Women's Hospital, Brisbane, AUSTRALIE ; ^g Royal Adelaide Hospital, Adelaide, AUSTRALIE ; ^h University of Melbourne, Melbourne, AUSTRALIE ; ⁱ Peter MacCallum Cancer Centre, Melbourne, AUSTRALIE

Background

Curative-intent treatment of patients with Stage III non-small cell lung cancer (NSCLC) frequently includes radical radiation, with International guidelines recommending radiation fields be constructed based on PET-identified extent of disease. Selective (targeted) LN sampling is most commonly performed. Studies in early stage (Stage I-II) NSCLC confirm systematic mediastinal lymph node (LN) staging with endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) improves accuracy of mediastinal staging. We sought to determine the impact of systematic mediastinal LN staging in Stage III using EBUS-TBNA to accurately delineate disease extent.

Methods

Consecutive participants with Stage III NSCLC based on clinical imaging underwent systematic LN staging via EBUS-TBNA. (ACTRN12617000333314). Primary study outcome was proportion of patients with PET-occult LN metastases detected by EBUS.

Results

Data was available for 168 of 173 eligible patients at the time of writing. M:F 103:65. Mean age 68 +/- 9 years.

EBUS demonstrated findings concordant with PET-identified mediastinal LN involvement in 101 (58%) of patients, with discordant findings (primary outcome) observed in 67 (40%) of patients.

PET-occult disease was identified by EBUS in 18 (10.4%) patients, with 11 of these upstaged (9 patients N2 → N3). EBUS identified lesser extent of disease in 49 patients (29%) with 38 (23%) down-staged to N1 (11) and N0 (27). Surgical confirmation of results was performed in 18 of 38, with 100% concordance.

Conclusion

Systematic LN staging via EBUS-TBNA identifies PET-occult LN disease in 10.4% of patients. A significant proportion of patients with cN2/3 NSCLC are confirmed to have pN0/1 following systematic assessment of mediastinal LN.

Further analysis will identify risk factors for identification of PET-occult metastases, and will confirm the impact PET-EBUS discordance in Stage III NSCLC on radiation dosimetry and tumour control probability.

Disclosure of funding source(s): none

Abstract #171

Not your usual Chest infection; C diff Empyema

SM¹. Husnain^{1a} (Dr), R^{1c}. Shepherd^{1a} (Pr), S. Shojaee^{1a} (Dr), D. Khemasuwan^{1a} (Dr)

^a *Virginia commonwealth university, Richmond, ÉTATS-UNIS*

Background:

C diff is an intestinal organism with rare extra intestinal manifestations¹. Here we present a case of C diff Empyema

Case report:

69 yo male with ESRD on HD and chronic dysphagia was seen in IP clinic for recurrent pleural effusion of unknown origin s/p indwelling catheter by radiology. It was first noted after ground-level fall in July where an indwelling catheter was placed by IR but never drained till he was admitted for pneumonia in September with worsening effusion. He underwent drainage from his IPC and was discharged without any further investigation of his pleural fluid. During his clinic visit, site of catheter looked abnormal, he was advised to be admitted to hospital where fluid was drained and culture grew C diff. IPC was removed and Chest tube was placed with copious drainage. Stool culture was negative, but this was collected after starting IV metronidazole, Esophagram and EGD were also performed to assess dysphagia and possible fistula as etiology with no significant findings. Post drainage resulted in pneumothorax ex vacuo, however, risks of surgery outweigh the benefits. Repeat repeat fluid cultures revealed no growth and the chest tube was removed. Patient was discharged home with close follow up.

Conclusion:

Initially thought to be a commensal neonatal organism², it was not till 1970s C Diff was associated with colitis³. Empyema is a very rare presentation of C diff infection. Precise mechanism of infection is unclear in our patient but bacteremia, disseminated infection and direct contamination of chest tube are reported mechanisms⁴. Most cases reported have been polymicrobial in nature but our patient had only C diff. This case should serve an important reminder for hygiene practice and care of Pleural catheter and careful selection to place an indwelling catheter.

Disclosure of funding source(s): none

Abstract #172

A new type of lung nodule ablation therapy -In vivo experiment of Contact Laser System on Beagle model.

G. Rong-Mei^a (Mlle), T. Chun-Li^a (Mme), L. Shi-Yue^a (Pr), C. Yu^{*a} (Pr)

^a *Guangzhou Medical University The first affiliated Hospital, Guangzhou, CHINE*

Objective

To investigate the injury and curative effect of high-temperature ablation in animal lung tissue by contact laser transbronchial ablation.

Method

Participants: Nine beagles

Instrument: Contact Laser System (The top of the optical fiber can contact the tissue by wavelength conversion.)

Power and time: 15-20W, 10-20s (data from in vitro experiments)

The steps of the experiment:

After sedation under general anesthesia, Beagles were intubated and supported by high-flow oxygen inhalation.

Bronchoscope(external diameter 2.0mm, operating orifice 1.8mm) localization to the periphery of the left or right lower lung.

Enter the integrated laser fiber with 0.6mm diameter, select the power and time, and perform peripheral lung ablation under C-arm real-time fluoroscopy.

CT examination showed pneumothorax immediately after ablation, which confirmed that the ablation was effective.

After resuscitation, beagles were reared. 1,7,14,28 days later, a CT examination was performed, lung tissue was taken for pathological examination, and the tissue changes were observed.

Result

After transbronchial lung tissue ablation, Beagles developed severe pneumothorax immediately. Pleural cavity puncture and aspiration and continue to observe. CT showed that pneumothorax basically disappeared after 7 days, and completely at 14 and 28 days, and there was no large area consolidation at the ablation site. Pathological sections showed that granulation hyperplasia of lung tissue filled the ablation cavity and formed tissue repair after 7 days.

Conclusion

The new Contact Laser System is different from the traditional ablation methods such as RFA, microwave, APC, and argon-helium cryoablation, which can instantly reach a high temperature above 300°C and achieve tissue combustion and gasification ablation. In vivo ablation showed the accurate range of thermal injury, tissue cavity was formed immediately after ablation, edge carbonation, long-term feeding vital signs were stable, and there was no obvious thermal after-effect. Therefore, the high-temperature ablation mode has a good prospect for transbronchial nodule ablation.

Disclosure of funding source(s): none

Abstract #173

The role of interventional pulmonology in the diagnosis and management of rare hematologic malignancies

E. Koukaki^a (Mlle), N. Anagnostopoulos^a (M.), A. Vontetsianos^a (M.), Z. Sotiropoulou^a (Mlle), S. Zaneli^a (Mlle), K. Bakiri^a (Mlle), E. Stagaki^a (Mlle), G. Stratakos^a (Pr)

^a *Interventional Pulmonology Unit of the 1st Respiratory Medicine Department National and Kapodistrian University of Athens. "Sotiria" General Hospital, Athens, Greece, Athens, GRÈCE*

Background: Non Lymphoma hematologic malignancies may rarely present with thoracic involvement. We report on 3 cases with such rare hematologic malignancies examined in our interventional pulmonology (IP) department during the last 6 months.

Case 1: ♀ 84 years-old, with a history of Waldenstrom macroglobulinemia (WM) and IgM amyloidosis, presented with recurrent right-sided pleural effusion (PE) for tissue sampling and further management. Differential diagnosis was among WM, amyloidosis or other malignancy. Medical thoracoscopy with pleural biopsies and talc poudrage was performed successfully. The histology revealed amyloidosis and WM, while a possible conversion to higher grade lymphoma could not be excluded. The patient was referred 2 months later to our department with recurrent left-sided PE which was also managed with medical thoracoscopy. Neither of the PEs recurred in the following 6 months.

Case 2: ♀ 66 years-old, presented with weight loss, spontaneous left upper arm fracture, a lesion (2.5x2cm) on the right hilum and right middle lobe atelectasis on chest CT. The lesion was identified and sampled with radial-EBUS. The histology revealed lung plasmacytoma and the patient was referred to the hemato-oncology department.

Case 3. ♂ 64years-old, presented with central left lower lobe lesion (13x18.5cm) and left-sided PE and no extrathoracic lesions. Protein electrophoresis was abnormal for monoclonal IgM gammopathy. EBUS bronchoscopy tissue samples from the lesion and the lymph nodes were not diagnostic. The patient underwent transthoracic fine needle biopsy and tissue was specifically sent to a hemopathology lab. The biopsy revealed bronchus associated lymphoid tissue lymphoma (BALT).

Conclusion: IP can safely and effectively contribute to diagnosis and management of rare hematologic malignancies. A high degree of suspicion for such diseases should be maintained since usually larger tissue samples and multidisciplinary approach is warranted.

Disclosure of funding source(s): none

Abstract #174

Usefulness of the insertion tube rotation function of bronchoscope in cadaver models

N. Shinagawa^{*a} (Dr), Y. Takashima^b (Dr), M. Kashima^b (Dr), D. Morinaga^b (Dr), S. Ito^b (Dr), M. Sato^b (Dr), K. Tsuji^b (Dr), H. Takahashi^b (Dr), T. Shoji^b (Dr), M. Furuta^b (Dr), T. Shichinohe^c (Dr), S. Konno^a (Pr)

^a Division of Respiratory Advanced Medical Device Development, Hokkaido University Hospital, Sapporo, JAPON ;

^b Department of Respiratory Medicine, Faculty of Medicine and Graduate School of Medicine, Hokkaido University, Sapporo, JAPON ; ^c Center for Medical Device Development, Hokkaido University Hospital, Sapporo, JAPON

Background and Objectives: The Olympus bronchoscope is equipped with an insertion tube rotation function, but there are few reports on its usefulness. We evaluated the amount of movement of bronchoscopists, difficulty, and operability of the bronchoscope with and without the bronchoscope insertion tube rotation function.

Methods: This study was performed in two cadaveric body by 10 bronchoscopists. The study was approved by the medical ethics committee of Hokkaido University School of Medicine (Approval No. 021-0111) and conducted in compliance with laws and guidelines. The primary endpoint was amount of movement of the bronchoscopists which was evaluated by motion capture. The bronchial generations that could be inserted of bronchoscope and the time required for insertion were also evaluated. In addition, the difficulty level of the bronchoscopists was evaluated in a questionnaire with a maximum of 5 points immediately after the operation.

Results: Bronchoscopist body movement during bronchoscopy for simulated lesions was significantly reduced in all lobes ($p < 0.05$). The difficulty of the bronchoscopists was significantly easier in the insertion tube rotation function use group in total for insertion into all segmental branches (3.9 points vs. 3.3 points, $p < 0.05$). On the other hand, there was no significant difference between the two groups in terms of insertable bronchial generations. Furthermore, in the test for inserting biopsy forceps to simulated target lesions, the difficulty of the bronchoscopists (3.9 points vs. 3.2 points, $p < 0.05$) and the assistance (4.0 points vs. 2.0 points, $p < 0.05$) were significantly easier in the insertion tube rotation function use group, respectively. The time to reach simulated target lesions was significantly shorter in the left lung using the insertion tube function group (20.4 sec. vs. 24.0 sec., $p < 0.05$).

Conclusion: The insertion tube rotation function of bronchoscope reduces the difficulty of operating the bronchoscope and improves the insertion operability.

Disclosure of funding source(s):

Research funding: Olympus, Olympus Medical Systems

Abstract #175

Endoscopic treatment of a bronchopleural fistula - case report

P. Horváth^{*a} (Dr), T. Komáromi^a (Dr), Z. Rozgonyi^a (Dr), D. Hammer^a (Dr)

^a *Semmelweis University, Budapest, HONGRIE*

Bronchopleural fistulas occur when there is an opening on the visceral pleura, therefore the airways and the pleural space communicate. Causes include benign conditions (empyema, suture insufficiency after surgery etc.) or as a consequence of cancer. Treatment options may be limited due to the poor general health condition of the patients. If surgery cannot be performed we have a number of endoscopic treatment options (endobronchial valves, tissue glues).

A 61 year old female patient was admitted to our Department for treatment of a pleural fluid accumulation. Thoracocentesis revealed pleural empyema. We performed chest tube insertion, followed by irrigation of the chest and broad spectrum antibiotic treatment. Continuous air leak was observed. Chest CT revealed a bronchopleural fistula on the outer surface of the lingula, contrast enhanced imaging also described a possibly malignant infiltrative disease concomitantly. We consulted thoracic surgeons, due to the tumorous infiltration they feared that suture insufficiency might occur as a consequence of surgery, therefore recommended other treatment modalities.

During bronchoscopy we performed retrograde bronchography and we found no communication with other segmental bronchi apart from left S4 and S5. After the bronchography we filled both segmental bronchi with Purastat tissue glue (3-D Matrix, Tokyo, Japan), and we applied tamponade to the bronchi with Surgicel absorbable hemostat (Ethicon, Cincinnati, Ohio, USA). After the intervention the air leak stopped, chest X-ray showed that the cavity around the trapped left lung filled with fluid. After 48 hours we removed the chest tube. Chest CT was performed a month later which showed no fistula or air in the chest cavity.

Disclosure of funding source(s): none

Abstract #176

Airway complications of COVID-19 during and after ICU hospitalization: The role of interventional pulmonology

G. Stratakos^a (Pr), N. Anagnostopoulos^a (M.), R. Alsagaaf^a (Mlle), E. Koukaki^a (Mlle), K. Bakiri^a (Mlle), P. Emmanouil^b (M.), C. Zisis^c (M.), K. Vachlas^d (M.), C. Vourlakou^e (Mlle), V. Andronadi^f (Mlle), A. Koutsoukou^a (Pr)

^a *Interventional Pulmonology Unit of the 1st Respiratory Medicine Department National and Kapodistrian University of Athens. "Sotiria" General Hospital, Athens, Greece, Athens, GRÈCE* ; ^b *Interventional Pulmonology Unit of Mediterranean Hospital, Athens, Greece, Athens, GRÈCE* ; ^c *Thoracic Surgery Department of Evangelismos Hospital, Athens, Greece, Athens, GRÈCE* ; ^d *Thoracic Surgery Department of Sotiria Hospital, Athens, Greece, Athens, GRÈCE* ; ^e *Pathology Department of Evangelismos Hospital, Athens, Greece, Athens, GRÈCE* ; ^f *Anesthesiology Department of Sotiria Hospital, Athens, Greece, Athens, GRÈCE*

Background: In the COVID-19 era, increased need for ICU admission, long-term intubation and delayed tracheostomy might lead to an unprecedented increase in airway stenoses, tracheoesophageal fistulae and other central airway complications (CAC).

Methods: Covid and post-covid cases referred to our department for airway complications during the past 2 years were collected.

Results: 25 cases of post-intubation tracheal stenosis and/or tracheoesophageal fistula, 1 case of foreign body aspiration (rhinopharyngeal tube) and 1 case of massive alveolar / airway hemorrhage were included. All patients underwent tracheal intubation and 12 had tracheostomy performed 20±7 days after intubation. The histopathology of the airway lesions revealed no specific findings related with viral tracheitis per se. All patients were managed successfully.

Conclusion: We confirm an increased incidence of CAC in patients intubated for COVID 19. It is essential to maintain a high level of suspicion for these complications and include them in the differential diagnoses of stridor in patients recently hospitalized.

Disclosure of funding source(s): none

Abstract #177

The Archimedes navigation system for the diagnosis of peripheral pulmonary nodule. Report on initial experience.

R. Tazi Mezalek^{*a} (Dr), P. Serra Mitjà^b (Dr), C. Centeno Clemente^b (Dr), C. Fernandez Arias^b (Dr), E. Barrio Herraiz^b (Dr), F. Andreo García^c (Pr), M. Avila Terzi^d (Dr), E. Castella Fernandez^d (Dr), I. Guasch Arriaga^e (Dr), J. Bechini Bernard^e (Dr), J. Abad Capa^b (Pr), A. Rosell Gratacós^f (Pr)

^a Hospital Germans Trias i Pujol - Head of the Interventional Pulmonology Program - Respiratory Medicine, Badalona (barcelona), ESPAGNE ; ^b Hospital Germans Trias i Pujol - Respiratory Medicine, Badalona (barcelona), ESPAGNE ; ^c Hospital Germans Trias i Pujol - Head of Bronchoscopy Unit - Respiratory Medicine, Badalona (barcelona), ESPAGNE ; ^d Hospital Germans Trias i Pujol - Department of Pathological Anatomy, Badalona (barcelona), ESPAGNE ; ^e Hospital Germans Trias i Pujol - Department of Radiology, Badalona (barcelona), ESPAGNE ; ^f Hospital Germans Trias i Pujol - Respiratory Medicine - Director Clinic de l'Àrea del Tòrax, Badalona (barcelona), ESPAGNE

Introduction: peripheral lung nodules diagnosis is still a challenge for bronchoscopists. The Archimedes Navigation System (Broncus Medical) offers intraluminal and extraluminal navigation combined with fused fluoroscopy. **Aims and objectives:** we report our initial experience of transbronchial biopsy (TBB) and transparenchymal needle aspiration (TPNA). No tunnelling was performed. **Methods:** Patients were enrolled from July 2019 to April 2022. A High-resolution CT scan was performed 1-5 days before. Cytology brush, TBB and TPNA were performed using the C arm verification. **Results:** Sixteen patients, 12 men (75%), median age 72 yr (53-81) with pulmonary opacities located in the distal third of the lung, median size 23.4 mm (16-31 mm) were included. Bronchus sign was present in 8 patients (50%). Selective bronchial washing was diagnostic in 25%. Brush cytology with cell blocks was performed in all the cases. ROSE of brush cytology was positive in 43.75% of the cases. Cell blocks were profitable in 86% of the positive cases. TBB were performed in 12 patients (75%) with 66% of diagnostic accuracy. Biopsy smears were positive in 89% of the positive cases. TPNA was performed in 7 patients (43.75%), but only one case was conclusive. Global diagnostic yield was 75%: ADK 43%, colorectal cancer metastasis 16%, SCC 25%, high-grade fusocellular carcinoma 8% and poorly differentiated carcinoma 8%. No major complications were registered. **Conclusions:** the Archimedes Navigation system brings an optimal planning pathway to target peripheral lung nodules. TBB and brush cytology presented a 75% diagnostic yield in this initial series, while TPNA did not render good results. Training is crucial to increase the initial results.

Disclosure of funding source(s): none

Abstract #179

Interventional closure of atrial septal defect occluder under respiratory endoscopy for bronchopleural fistula: a report of 6 cases

C. Chen^a (Dr), Y. Song^a (Pr), Y. Tang^a (M.), K. Zhai^a (M.)

^a *Department of Thoracic Surgery, Affiliated Hospital of Zunyi Medical University, Zunyi, CHINE*

Background

Broncho pleural fistula is a serious complication of pulmonary resection refers to fistula formation between bronchial and pleural levels of all causes, pneumonectomy, lobectomy is particularly common. The emergence and development of interventional treatment technology provides new possibilities for the treatment of bronchial fistula. In this study, we reported six cases of atrial septal defect using occluder treatment of bronchial fistula clinic experience.

Case report

Six patients with bronchopleural fistula admitted to the Department of Thoracic Surgery of the Affiliated Hospital of Zunyi Medical University from January 2018 to December 2020, all patients with bronchopleural fistula after lobectomy. Underlying diseases: two cases of bronchial lung cancer and four cases of tuberculosis (one case was aspergilloma and three cases were destroyed lung). Operation sites: one case of left pneumonectomy, two cases of left upper pneumonectomy, two cases of right upper pneumonectomy, one case of right middle and lower pneumonectomy. Of which three males, three females, average age 62 years old. All patients underwent occlusion parties signed an informed consent form, were reported to the hospital ethics committee approval. Six patients, five were successfully inserted ASD occluder, one patient surgical failure. Five patients had successful surgery recovery was very satisfactory.

Conclusion

The atrial septal occluder is used to seal the bronchopleural fistula formed after lobectomy, and then the local cauterization of the mucosa around the occluder is applied to promote local granulation hyperplasia. This surgical method has good clinical effects and is worthy of popularization.

Disclosure of funding source(s): none

Abstract #180

A new type of lung nodule ablation therapy -In vivo experiment of Contact Laser System on Beagle model.

RM. Geng^a (Mlle), CL. Tang^a (Mme), SY. Li^a (Pr), Y. Chen^{*a} (Pr)

^a *Guangzhou Medical University The first affiliated Hospital, Guangzhou, CHINE*

Objective

To investigate the injury and curative effect of high-temperature ablation in animal lung tissue by contact laser transbronchial ablation.

Method

Participants: Nine beagles

Instrument: Contact Laser System (The top of the optical fiber can contact the tissue by wavelength conversion.)

Power and time: 15-20W, 10-20s (data from in vitro experiments)

The steps of the experiment:

After sedation under general anesthesia, Beagles were intubated and supported by high-flow oxygen inhalation.

Bronchoscope(external diameter 2.0mm, operating orifice 1.8mm) localization to the periphery of the left or right lower lung.

Enter the integrated laser fiber with 0.6mm diameter, select the power and time, and perform peripheral lung ablation under C-arm real-time fluoroscopy.

CT examination showed pneumothorax immediately after ablation, which confirmed that the ablation was effective.

After resuscitation, beagles were reared. 1,7,14,28 days later, a CT examination was performed, lung tissue was taken for pathological examination, and the tissue changes were observed.

Result

After transbronchial lung tissue ablation, Beagles developed severe pneumothorax immediately. Pleural cavity puncture and aspiration and continue to observe. CT showed that pneumothorax basically disappeared after 7 days, and completely at 14 and 28 days, and there was no large area consolidation at the ablation site. Pathological sections showed that granulation hyperplasia of lung tissue filled the ablation cavity and formed tissue repair after 7 days.

Conclusion

The new Contact Laser System is different from the traditional ablation methods such as RFA, microwave, APC, and argon-helium cryoablation, which can instantly reach a high temperature above 300°C and achieve tissue combustion and gasification ablation. In vivo ablation showed the accurate range of thermal injury, tissue cavity was formed immediately after ablation, edge carbonation, long-term feeding vital signs were stable, and there was no obvious thermal after-effect. Therefore, the high-temperature ablation mode has a good prospect for transbronchial nodule ablation.

Disclosure of funding source(s): none

Abstract #181

Clinical impact of neutrophil-to-lymphocyte ratios in the blood and bronchoalveolar lavage fluid in patients with lung cancer

HS. Nam^{*a} (Pr), WK. Ryu^a (Dr), H. Cha^a (Dr), Y. Moon^a (Pr), C. Kim^b (Pr)

^a Inha University Hospital, Incheon, CORÉE, RÉPUBLIQUE DE ; ^b Jeju National University Hospital, Jeju, CORÉE, RÉPUBLIQUE DE

The cumulative results indicate that the neutrophil-to-lymphocyte ratio of peripheral blood (pbNLR) is a cost-effective and useful prognostic factor in patients with various cancers, including lung cancer. Bronchoalveolar lavage (BAL) is a common, easily and safely performed diagnostic/therapeutic procedure for all lung disease patients. Furthermore, the BAL fluid of patients with lung cancer is in direct contact with the lung tumor, in contrast to peripheral blood. However, no study has reported on the clinical utility of the NLR of BAL fluid (bNLR) for patients with lung cancer. To investigate the clinical utility of the bNLR as a prognostic factor in patients with lung cancer, we conducted a retrospective review of the prospectively collected data.

A total of 48 patients were classified into high bNLR ($n=31$) and low bNLR ($n=17$) groups. A high pbNLR and high bNLR were associated with a shorter overall survival ($p < 0.001$ and $p=0.020$, respectively). Moreover, the results of survival analysis according to the combination score that encompasses the bNLR and the pbNLR show that an increment in the combination score was associated with a shorter overall survival ($p < 0.001$). A multivariable analysis confirmed that TNM stage ($p=0.002$), pbNLR ($p=0.009$), bNLR ($p=0.008$), and C-reactive protein ($p=0.029$) were independent predictors of overall survival. Similar to the pbNLR, a high bNLR value was associated with a poor prognosis in patients with lung cancer. Although further studies are required to apply our results clinically, this is the first study to show the clinical value of the bNLR in patients with lung cancer.

Disclosure of funding source(s): none

Abstract #182

Long-term efficacy and safety of silicone stents for the treatment of 110 cases of benign airway stenosis

LQ. Lin^a (Mlle), Y. Chen^b (Pr), CH. Zhong^b (Pr), XB. Chen^b (Dr), CL. Tang^b (Dr), ZQ. Zhou^b (Dr), SY. Li^{*b} (Pr)

^a *The First Affiliated Hospital of Guangzhou Medical University, National Clinical Research Center for Respiratory, Guangzhou Institute of Respiratory Disease, State Key Laboratory of Respiratory Disease., Guangzhou, CHINE* ; ^b *The First Affiliated Hospital of Guangzhou Medical University, National Clinical Research Center for Respiratory, Guangzhou Institute of Respiratory Disease., Guangzhou, CHINE*

Background: There is a lack of long-term efficacy studies of silicone stents in the treatment of Benign Airway Stenosis.

Methods: We retrospectively reviewed the clinical data of patients with benign airway stenosis who were treated with silicone stents at the First Affiliated Hospital of Guangzhou Medical University from March 2012 to October 2021. The general clinical data, diagnosis, interventional procedures, bronchoscopic findings and related complications were collected and analyzed.

Results: A total of 110 patients with benign airway stenosis met the inclusion criteria. There were 43 males (39.1%) and 67 females (60.9%), ages 13 to 76 years, with an average age of (41.78±15.26) years old. The placement position of silicone stents was left main bronchus in 43 patients (39.1%), right main bronchus in 14 patients (12.7%), and trachea in 53 patients (48.2%). The median time of stent placement was 16.35 months.

For 110 patients, the significant effective rate was 30.9%, the effective rate was 32.7%, the ineffective rate was 36.4%, and the total effective rate was 63.6%. The stent-related complications included secretion retention 71.8%, granuloma formation 65.5%, stent angulation 20% and stent migration 10.9%. There was a significant statistical difference between the left main bronchus and trachea in curative effect ($P=0.004$), the total rate of complications ($P=0.04$), granuloma formation ($P<0.001$), and stent angulation ($P<0.001$).

Multivariate logistic regression analysis showed that age ($P = 0.013$, OR= 3.713, 95% CI: 1.325-10.403), stent placement time ($P = 0.001$, OR = 0.177, 95% CI: 0.067-0.47), and the total times of tracheoscopy after stent implantation ($P = 0.024$, OR = 3.211, 95% CI: 1.163-8.864) were statistically significant and had independent influence on the prognosis.

Conclusions: Airway silicone stent has a good curative effect and high safety in the treatment of benign airway stenosis. The curative effect and safety still need to be further improved.

Disclosure of funding source(s): none

Abstract #183

Five versus ten pharyngeal sprays of 10 percent lignocaine for topical anesthesia during flexible bronchoscopy: A multicenter randomized controlled trial.

K. Madan^a (Dr), H. Iyer^a (Dr), M. Mishra^b (Dr), G. Sindhvani^b (Dr), S. Mittal^a (Dr), A. Mohan^a (Dr), V. Hadda^a (Dr), R. Guleria^a (Dr)

^a All India Institute of Medical Sciences (AIIMS), New Delhi, India, New Delhi, INDE ; ^b All India Institute of Medical Sciences (AIIMS), Rishikesh, India, Rishikesh, INDE

Background

Ensuring adequate patient comfort is crucial during bronchoscopy. Although lignocaine spray is recommended for topical pharyngeal anesthesia, the optimum dose of sprays is unclear. We compared five vs. ten sprays of 10% lignocaine for topical anesthesia during bronchoscopy.

Methods

In this investigator-initiated, prospective, multicenter, randomized clinical trial, subjects were randomized to receive five (Group A) or ten sprays (Group B) of 10% lignocaine. The primary objective was to compare the operator-rated overall procedure satisfaction between the groups.

Results

Two hundred eighty-four subjects were randomized [143, Group A, and 141, Group B]. The operator rated overall procedure satisfaction, VAS [(mean (SD))] was similar between the groups: Group A, 74.1 (19.9), Group B, 74.3 (18.5), $p=0.93$. The VAS scores of patient-rated cough, [mean (SD)] [Group A, 32.5 (22.9) and Group B, 32.3 (22.2), $p = 0.93$], and operator rated cough [Group A, 29.8 (22.3) and Group B, 26.9 (21.5), $p= 0.26$] were also similar. The time to reach vocal cords, overall procedure duration, mean doses of sedatives, the proportion of subjects willing to return for a repeat procedure (if required), and complications were not significantly different. Subjects in Group A received a significantly less cumulative lignocaine (mg), mean (SD) [Group A: 293.9 (11.6), Group B: 343.5 (10.6), $p<0.001$].

Conclusions

Topical anesthesia with five sprays of 10% lignocaine was associated with similar operator-rated overall procedure satisfaction at a lower cumulative lignocaine exposure than ten sprays. During bronchoscopy, five sprays of 10% lignocaine should be used for pharyngeal anesthesia.

Disclosure of funding source(s): none

Abstract #184

Bronchoscopic resection preceded by bronchial artery embolization of a large bronchial carcinoid tumour : A case report

S. Jain^{*a} (Dr), V. Nanda^a (Dr), M. Pilaniya^a (Dr)

^a *Ramkrishna Care Hospital, Raipur, INDE*

Background: Bronchial carcinoid tumours are relatively rare neuroendocrine tumours and account for about 1-2% of all primary lung malignancies. They are usually well circumscribed, slow growing tumours but have high chances of massive bleeding. The endobronchial carcinoids can be managed by bronchoscopic resection as a less invasive option as compared to surgery. Massive bleeding can be prevented by bronchial artery embolization prior to bronchoscopic resection.

Case report: 29 year old female presented to us with complaints of cough, breathlessness and intermittent mild haemoptysis for last 2 years. Her computed tomography (CT) of chest showed a mass in the right main bronchus with complete collapse of the right lung. Diagnostic bronchoscopy was performed which showed a large, round, highly vascular endobronchial mass completely obstructing the right main bronchus. Endobronchial biopsies from the mass confirmed the diagnosis of typical carcinoid tumour.

The patient was planned for rigid bronchoscopic resection of the endobronchial carcinoid. In view of high risk of bleeding, we did bronchial artery embolization prior to bronchoscopic resection.

Rigid bronchoscopic intubation was done. The endobronchial mass was ablated with holmium laser, followed by piecemeal removal with snare and rigid biopsy forceps. There was minimal bleeding during bronchoscopic resection. Complete resection of the tumour was achieved at the end of the procedure. The patient was discharged the next day.

Conclusion: Bronchoscopic resection is a less invasive option and can be curative in many patients with typical endobronchial carcinoid. Bronchial artery embolization can significantly reduce the chances of massive bleeding during bronchoscopic resection of these tumours and should be considered in these patients prior to doing the procedure.

Disclosure of funding source(s): none

Abstract #185

An international survey of practices in the investigation of peripheral pulmonary lesions amongst interventional pulmonologists

T. Soumagne^a (Dr), H. Dutau^b (Dr), GA. Eapen^c (Dr), N. Guibert^d (Pr), CA. Hergott^e (Dr), F. Maldonado^f (Pr), H. Saka^g (Dr), M. Fortin^h (Dr)

^a Assistance Publique des Hôpitaux de Paris, Paris, FRANCE ; ^b Assistance Publique des Hôpitaux de Marseille, Marseille, FRANCE ; ^c MD Anderson Cancer Center, Houston, ÉTATS-UNIS ; ^d Hôpital Larrey, Toulouse, FRANCE ; ^e Foothills Medical Center, Calgary, CANADA ; ^f Vanderbilt University Medical Center, Nashville, ÉTATS-UNIS ; ^g Matsunami General Hospital, Gifu, JAPON ; ^h Institut Universitaire de Cardiologie et Pneumologie de Quebec, Quebec City, CANADA

Introduction: The investigation of peripheral pulmonary lesions (PPL) can be challenging. Several modalities, endoscopic or percutaneous, can be used to biopsy PPL but data comparing modalities is scarce. This international survey was conducted to describe current medical practices in PPL investigation among interventional pulmonologists (IP).

Methods: This survey was sent to all members of the Group d'Endoscopie Thoracique de Langue Française (GETIF), Canadian Thoracic Society Procedures Assembly (CTS-PA), American Association for Bronchology & Interventional Pulmonology (AABIP) and World Association for Bronchology & Interventional Pulmonology (WABIP). The survey was composed of 51 questions to establish a portrait of techniques used to investigate PPL by IP around the world.

Results: Three hundred IP responded to the survey. Most of them practice in Europe ($n = 117$, 39%), North America ($n = 94$, 31%) and Asia ($n=44$, 15%). 58% of responders perform more than 100 endoscopic procedures for PPL per year. General anesthesia and conscious sedation are used in similar proportions (54% and 46% respectively). Rapid On site Examination (ROSE) is used when sampling PPL by 44% of IP. Peripheral EBUS (67%), fluoroscopy (55%) and electromagnetic navigation (26%) are the most widely available and used techniques. Most IP combine techniques (66%). Robotic bronchoscopy (15%) and cone beam CT (7%) are almost exclusively used in the United States of America where, respectively, 58% and 23% of responders reported using these two techniques. Self-evaluated diagnostic yield for endoscopic PPL procedures varied among techniques and centers. Investigation strategies widely varied for each clinical case presented. Finally, only 12% of bronchoscopists currently had access to endoscopic treatment modalities for PPL. However, half of the remaining IP plan to acquire an endoscopic therapeutic modality in the next 2 years.

Conclusion: Practices worldwide vary significantly in endoscopic techniques used to sample PPL, type of sedation and presence of ROSE.

Disclosure of funding source(s): none

Abstract #186

Virtual Bronchoscopic Navigation-Guided Dye Marking for Localization of Pulmonary Nodules

L. Xu^{*a} (Dr)

^a Shandong Provincial Public Health Clinical Center, Jinan, CHINE

Abstract

Background: Virtual Bronchoscopic Navigation(VBN)-guided dye marking is a useful localization method for small pulmonary nodules. This study evaluated the efficacy and safety of intraoperative VBN-guided dye marking.

Methods: Patients who underwent VBN-guided dye marking for small pulmonary nodules were investigated retrospectively. Efficacy was evaluated on the basis of the success rates of dye marking (visible dye mark) and nodule Localization (dye marking within 2cm of the nodule), and safety was evaluated on the basis of the rate of VBN related complications.

Results: Since 2020, VBN-guided dye marking was performed on 91 nodules in 86 patients, including 52 female and 34 male. Mean age 53.79 ± 11.78 years (median 55), mean diameter of lesions 8.9 ± 3.44 mm (median 8.5 mm). The location of pulmonary nodules was 17% in LB1, 14% in RB1 and 10% in RB2. Dyeing methods included 7 cases of Methylene blue and 83 cases of Indocyanine Green (ICG). The success rate of dye marking and it within 2cm of the nodule was 96.7% (88/91). The reason of 3 cases failure: 1 case had too much staining dose (0.4ml), resulting in too large staining range, location of injection site >5 cm away from pleura in 2 patients. There were no complications.

Conclusions: VBN-guided dye marking was effective and safe for the localization of small pulmonary nodules. Compare Methylene blue and ICG, ICG is more easy to distinguish nodules and dye marking.

Disclosure of funding source(s): none

Abstract #187

Airway morphological abnormalities of bronchiolitis assessed by endobronchial optical coherence tomography

S. Zhuquan^a (Dr), L. Shiyue^a (Pr)

^a *The First Affiliated Hospital of Guangzhou Medical University, Guangzhou, CHINE*

Background: Few studies have reported the medium-sized and small airway morphological abnormalities of bronchiolitis, i.e. bronchiolitis obliterans (BO) and diffuse panbronchiolitis (DPB). Whether impulse oscillometry (IOS) is feasible to reflect small airway remodeling in bronchiolitis remains unclear.

Objectives: Aiming to demonstrate the airway morphological abnormalities of BO and DPB assessed by endobronchial optical coherence tomography (EB-OCT), and elucidate whether spirometric and IOS parameters could reflect the airway remodeling of bronchiolitis.

Methods: We recruited 18 patients with bronchiolitis (BO, n=9; DPB, n=9) and 17 control subjects. Assessments of clinical features, SGRQ, chest CT, spirometry, IOS, bronchoscopy and EB-OCT were performed. The association of EB-OCT and lung function parameters were determined with correlation analysis.

Results: The magnitude of abnormalities of spirometry and IOS parameters were significantly greater in patients with bronchiolitis than in control subjects (all $P < 0.05$). Patients with BO had notably lower FEV₁, FVC, FEV₁/FVC, MMEF% pred and higher Fres and AX than those with DPB (all $P < 0.05$). The EB-OCT measurement in patients with bronchiolitis and Bland-Altman analysis between the bronchus in the left and the right lung demonstrated a heterogeneous distribution of airway calibers, presenting high intra- and inter-individual variability. Patients with bronchiolitis had notably greater airway wall area (Aw%7-9 and Aw%3-9) (both $P < 0.05$) compared to control, while BO presented greater magnitude of airway abnormalities than DPB. Fres and R₅-R₂₀ correlated negatively with medium-sized and small airway inner area (Ai3-6 and Ai7-9), and positively with airway wall area (Aw%3-6 and Aw%7-9) (all $P < 0.05$), whose correlation coefficients were higher than those of spirometric parameters.

Conclusions: Bronchiolitis, BO and DPB, manifested a heterogeneous distribution of airway calibers with significant intra- and inter-individual variability. IOS parameters, rather than spirometry, correlated better with medium-sized and small airway remodeling in bronchiolitis assessed by EB-OCT measurement.

Disclosure of funding source(s): none

Abstract #188

A case of pulmonary endometriosis was treated by PDT

F. Long^{*a} (Pr), L. Long^a (Mlle), T. Wang^a (M.), P. Fu^a (M.), W. Huang^a (Mlle)

^a *University of Chinese Academy of Sciences Shenzhen Hospital, Shenzhen, CHINE*

A 34-year-old female patient was admitted to our hospital on December 23rd, 2020 due to "recurrent hemoptysis for more than one year". The patient began to develop menstrual hemoptysis without obvious incentive from October 2019. she visited another hospital, Chest CT revealed solid small nodules in the lateral middle lobe of the right lung, which were considered as benign lesions. Bronchoscopy suggested: active hemorrhage in the posterior segment of the upper left apex; Ultrasonography revealed: 1. abnormal intrauterine echo, and the possibility of endometrial polyp remained to be excluded; 2. hypertrophy of uterus, abnormal echo of muscle layer, and the possibility of adenomyosis remained to be excluded. The diagnosis of adenomyosis was made, but the specific treatment remained unknown. The patient had her period last night and had hemoptysis again. The last menstruation period (LMP) was 2020-12-22.

Bronchoscopic photodynamic therapy was performed on December 24th, 2020-24

The patient underwent endoscopy through oral endotracheal intubation. BAL was made on the natural branch of the left upper lobe, and more purulent secretions were lavaged. Photodynamic therapy was performed on the apical, anterior and posterior segments of the left upper lobe. (Equipment model: PDT630-A The wavelength : 630 nm power: 2W)After the operation, anti-infection treatment like moxifloxacin was given, and the patient was in good condition without hemoptysis, cough, expectoration, chest tightness or dyspnea. In the first month after surgery, she experienced a small amount of hemoptysis during menstruation, and no hemoptysis was seen after the second month. Preoperative CT: thoracic symmetry; patchy, slightly high-density, and ill-defined shadows were observed in the upper lobe of the left lung.

At 11 months after the operation, the exudative lesions in the upper lobe of the left lung were absorbed and disappeared.

Disclosure of funding source(s): none

Abstract #189

LONGITUDINAL EXISTANCE OF SELF-EXPANDABLE METALLIC STENT FOR BENIGN TRACHEAL STENOSIS

K. Utsumi^{*a} (Dr), M. Nakashima^a (Dr), F. Terada^a (Dr), S. Akashi^a (Dr), A. Shimada^a (Dr), S. Oonaka^a (Dr), A. Aoyama^a (Dr), A. Nagai^a (Dr), M. Oda^a (Dr)

^a *Shin-Yurigaoka General Hospital, Kawasaki, JAPON*

Self-expandable metallic stent (SEMS) is not indicated for benign stenosis of Bronchus or trachea. Benign stenosis must be opened by Silicon stent such as Dumon stent, because removing of stent will be need. Rare situation was proper for metallic stent of benign stenosis. We have an experience with a case of benign tracheal stenosis patented by SEMS 20 years ago. This case is Symmetric polylipomatosis (Madelung Disease). He suffered dyspnea and was performed resection of Lipomatosis of neck. But dyspnea was deteriorated. Bronchoscopy revealed a tracheal stenosis due to Lipomatosis of neck. Balloon dilatation was tried but no full enlargement of tracheal stenosis. We selected SEMS for this tracheal stenosis. After 20 years, this case was suffered of aspiration pneumonia and then Bronchoscopy was performed. SEMS maintained as equal as inserted position. A few granuloma was existed at the terminal position of SEMS. We report long term patency of SEMS for benign tracheal stenosis.

Disclosure of funding source(s): none

Abstract #190

Efficacy of transbronchial cryobiopsy using 1.1mm probe combined with ultrathin bronchoscope and Lungpoint navigation for peripheral pulmonary lesions: A retrospective cohort study

H. Ouyang^{*a} (Dr)

^a Xi'an International Medical Center hospital, Xi'an, CHINE

Background: Peripheral pulmonary lesions are very common in clinical settings. Acquiring adequate tissue sample remains a challenge. It is assumed that the combination of 1.1mm probe transbronchial cryobiopsy, ultrathin bronchoscope and Lungpoint navigation could increase the diagnostic value of peripheral pulmonary lesions. **Objective:** The aim of this study is to evaluate the efficacy and safety of transbronchial cryobiopsy using 1.1mm probe combined with ultrathin bronchoscope and Lungpoint navigation for peripheral pulmonary lesions. **Methods:** We retrospectively analyzed 106 patients with who underwent 1.1mm probe transbronchial cryobiopsy with ultrathin bronchoscope and Lungpoint navigation from March 2021 to May 2021 in Xi'an International Medical Center hospital. We collected the baseline information of participants, reported diagnostic yield and complications, and analyzed factors may have affected the diagnostic yield. **Results:** A total of 106 peripheral pulmonary lesions, with an average diameter of 20.11 ± 12.23 mm, underwent the procedure, and the diagnostic yield was 90.11% (96/106). Of the 96 lesions diagnosed by this procedure, 45 were lung cancers, 5 were other malignancies, 9 were atypical adenomatous hyperplasia, 5 were tuberculosis, 6 were organizing pneumonia, 5 were pulmonary interstitial fibrosis, 21 were acute and chronic pneumonia. The remaining 10 undiagnosed lesions were diagnosed by re-examination with cryobiopsy, TTNB or Lungpoint-TBNA. The diagnostic yield was unchanged by factors including rEBUS findings (within, adjacent to) and lobe localization. There was no presentation of pneumothorax or severe hemorrhage. **Conclusions:** The transbronchial cryobiopsy using 1.1mm probe combined with ultrathin bronchoscope and Lungpoint navigation is feasible, safe, and has a high diagnostic yield in the diagnosis of peripheral pulmonary lesions.

Disclosure of funding source(s): none

Abstract #191

Transbronchial microwave ablation of lung nodules with Lungpoint navigation bronchoscopy guidance and Dyna-CT monitoring—a novel technique and initial experience with 35 cases

H. Ouyang^{*a} (Dr)

^a Xi'an International Medical Center hospital, Xi'an, CHINE

Background: Microwave ablation can provide a faster, larger and more predictable ablation zone than other energy sources in the local therapy of lung nodules. In addition, bronchoscopic transbronchial ablation has theoretical advantage of fewer pleural-based complications than percutaneous approach. The aim of this study is to determine whether the novel combination of Lungpoint navigated bronchoscopic approach and microwave ablation monitored by Dyna-CT in the management of lung nodules is technically feasible, safe and effective. **Methods:** We retrospectively analyzed 35 patients with lung nodules who underwent Lungpoint navigation bronchoscopy microwave ablation in Dyna-CT hybrid operating room in Xi'an International Medical Center hospital. Patients had high surgical risks while lung nodules were either proven malignant or radiologically suspicious. Primary endpoints include technical feasibility and safety. **Results:** 38 lung nodules from 35 patients were treated. Mean nodule size was 13.8 mm, and bronchus directly leads to the nodules (bronchus sign positive) in 19 lung nodules. Lungpoint-TBNA with Flexneedle was performed in remaining 19 nodules. Technical success rate was 100%, only 1 nodule required double ablation for adequate coverage. Mean minimal ablation margin was 5.32 mm. The mean actual ablation zone volume was +5.6% compared to predicted. There was no significant heat sink effect. Mean procedural time was 68.6 min (40.6-122.1). There was no presentation of pneumothorax, pleural effusion or hemoptysis. After median follow up of 6 months, none of the nodules had evidence of progression. **Conclusions:** Lungpoint navigation bronchoscopic transbronchial microwave ablation monitored by Dyna-CT is safe and feasible for treatment of malignant lung nodules. A prospective study on clinical application of this novel technique is warranted.

Disclosure of funding source(s): none

Abstract #192

Therapeutic role of liquid nitrogen spray cryotherapy in treatment of central endobronchial malignancy

O. Zahran^{*a} (Dr), A. Youssef Gad^b (Pr)

^a Faculty of Medicine, Tanta, ÉGYPTE ; ^b Faculty of Medicine, Alexandria, ÉGYPTE

Background: endo bronchialspray cryotherapy is a modality of bronchoscopic cryotherapy promising high grades of success during paliative treatment of endobronchial obstruction.

Aim : to evaluate the safety and efficacy of the Cryo Spray Ablation System in treatment of central airway lesions using liquid nitrogen sprayed through acatheter via flexible fiberoptic bronchoscopy, also to assess the effect of such modality on patient clinical manifestations, imaging and other investigations.

Patients and Methods: This work was caried out on 20 patients with central malignant tracheobronchial lesions.They were folowed up clinicaly, radiologicaly and by bronchoscope at zero (before cryospray),2 weeks, 1 month and 2 months after Spray Cryotherapy.

Results:There was significant improvement in dyspnea,cough, hemoptysis, chest pain, Karnofsky performance status, 6 Minute Walking Test, pulmonary function, degree of obstruction, pulmonary atelectasis, lobar collapse and neoplastic mass 2 weeks, one month and 2 months after cryotherapy. But there were insignificant changes in PO2 before and after cryotherapy.

Conclusion: Bronchoscopic spray cryotherapy with the newly developed cryoprobe, permits efective, safe and inexpensive therapy and can be used in treatment of malignant central air way obstruction.

Key words: CENTRAL AIRWAY OBSTRUCTION; ENDOBRONCHIAL SPRAY CRYOTHERAPY.

Correspondingauthor:Ola Abdel ftah Elsayy Zahra,M.B.B.CH,Department of Chest,Faculty of Medicine,Tanta University, Elsanta, Gharbia, Egypt.

Disclosure of funding source(s): none

Abstract #193

Meta-analysis of the safety and efficacy of metal stents for benign tracheal stenosis

M. Fan^a (Dr), S. Li^a (Pr), Z. Su^a (Dr)

^a *The First Affiliated Hospital of Guangzhou Medical University, Department of Pulmonary and Critical Care Medicine, Guangzhou, CHINE*

Abstract

Objective: Even though the use of self-expandable metallic stents (SEMS) in benign airway diseases has been warned by the FDA due to the risk of stent-related complications and difficulties of their removal, accumulating studies have yielded inconsistent or conflicting findings. To shed light on these contradictory results and to more precisely evaluate the relationship between self-expandable metallic stents and benign tracheal stenosis (BTS), we performed a meta-analysis of published studies.

Data sources: PubMed, the Cochrane Library, Web of Science, Embase and ClinicalTrials.gov from January 2000 to April 2022.

Review methods: Data on related trials were obtained by doing a literature search in PubMed, Web of Science and Cochrane Library. Random-effect and fixed-effect models were used to calculate the efficacy and incidence of complication of SEMS placement. **Results:** A total of 575 participants received 700 SEMS over this period. The main causes of benign airway stenosis included tracheotomy (32.8%), anastomotic stenosis after transplantation or lobectomy (31.3%), tracheal intubation (18.1%), and airway stenosis caused by other benign diseases (17.8%). The study showed that the effective rate of metal stent in the treatment of benign airway stenosis was 73.8%, the average placement time was 9.2 ± 13.4 months, while the success rate of stent removal was 92.5%. The incidence of complications after stent implantation was 48.6%, including granulation tissue hyperplasia (30%), stent displacement (16.5%), mucus occlusion (10.9%), and airway restenosis (16%). Stent-related mortality was not occurred. **Conclusions:** SEMS might serve as an effective treatment for benign airway stenosis with bronchoscopic treatable complications and rare potential life-threatening reactions, particularly in the short term use for maintaining airway patency under the intensive observation. Further multicenter trials are needed to subsequently verify the efficacy and safety of SEMS in the treatment of benign airway stenosis. **Keywords:** Bronchoscopy; Self-expandable metallic stent; Tracheal stenosis; Safety; Meta-analysis

Disclosure of funding source(s): none

Abstract #194

Covered metallic stent versus silicone stent for malignant esophagorespiratory fistula: A single-center retrospective cohort study

L. Lin^a (M.), J. Zeng^a (Mlle), Z. Chen^a (M.), M. Ke^{*a} (Dr)

^a Xiamen Medical College Affiliated Second Hospital, Xiamen, CHINE

Background: Malignant esophagorespiratory fistulas is an intractable and fatal disease. We aimed to compare the efficacy and safety of covered metallic stent and silicone stent for malignant ERF.

Method: We retrospectively reviewed data of patients with malignant esophagorespiratory fistulas who underwent placement of metallic stent or silicone stent at our study site between November 2011 and February 2021. The primary outcome was the clinical success rate. Safety was also monitored.

Results: There were 218 patients met our inclusion and exclusion criteria, 92 were included in covered metallic stent group and 126 in silicone stent group. The median follow-up duration was 78.0 days (95%CI: 62.5 - 93.5). The clinical success rate was numerically lower in covered metallic stent group (84.7% vs. 90.7%, $P=0.20$). The dyspnea scale in both groups was significantly improved after stenting, but no between-group difference in the change of dyspnea scale was detected ($P=0.80$). The stents were removed for the healed fistula in 16 patients (5 in metallic stent and 11 in silicon stent, $P=0.7$). Silicone stent yielded a markedly longer survival duration (98.0 days, 95%CI: 48.8-147.2) than covered metallic stent group (52.0 days, 95%CI: 34.0 - 70.1) ($P=0.01$). Multivariate logistic regression analysis showed, none of the fistula size, PS score and history of radiotherapy was the risk factor for survival. The overall rate of complication was similar in two groups. Rupture of stent membrane and mesh fracture only took place in metallic stent group.

Conclusion: Silicone stent is non-inferior to covered metallic stent for palliative treatment and could effectively manage malignant esophagorespiratory fistulas. Placement of both stents are well tolerated.

Disclosure of funding source(s): none

Abstract #195

Successful treatment of obstructive tracheobronchopathia osteochondroplastica by argon plasma coagulation and rigid bronchoscopy

JM. Laca Forero^a (Dr), PF. Garcia Mantilla^a (Dr), A. Coz-Roncagliolo^a (Dr)

^a *Inter Neumo, Lima, PÉROU*

Background: Tracheobronchopathy osteochondroplastica (TO) is a rare benign illness, characterized by confluent osteocartilaginous nodules on the submucosa of the trachea and main bronchus that respect the posterior wall. This disease has a wide range of symptoms: chronic cough, dyspnea, stridor, hemoptysis, and recurrent airway infections. Patients may present from asymptomatic to severe airway obstruction. The diagnosis is made by tomography or bronchoscopy. There is no curative treatment but we can perform endoscopic interventions to relieve symptoms, for this reason we report this case.

Case Report: A 47-year old woman presents with cough, dyspnea on exertion, recurrent mild hemoptysis of one-year. Physical examination reveals inspiratory wheezing. Bronchoscopy demonstrates conglomerated white indurated nodular tracheal protuberances from the subglottis to the precarinal area with normal posterior wall. Histopathology shows nodular chronic inflammation of tracheal submucosa and osteocartilaginous tissue compatible with TO. Rigid bronchoscopy Thermoablation with Argon Plasma Coagulation (APC) was performed using APC ® 2 Unit Erbe Elektromedizin GmbH, flexible 1.5 mm probe with integrated membrane filter, axial beam and pulsed APC mode effect 2 with 20 - 30 Watts, as well as biopsy forceps for debris removal. Soon after the procedure, the patient reports improvement of symptoms, resuming her daily activities. A follow-up bronchoscopy will be scheduled in 3 months. In case of residual nodules or recurrence, a second Bronchoscopy with APC will be performed.

Conclusion: APC is a technique used for thermoablation of endoluminal airway lesions. Using ionized Argon gas conducted through a probe onto the tissue. An electric current is produced generating a contactless thermal effect, thus resulting in a longer spark and more superficial propagation than conventional electro-surgery, making APC safer with lower perforation risk. The Rigid Bronchoscope helps the mechanical debulking of nodules while adequately securing the airway.

Disclosure of funding source(s): none

Abstract #196

A biomarker-based approach for the determination of sample adequacy during endobronchial ultrasound-guided transbronchial needle aspiration

T. Ishiwata^a (Dr), A. Sage^b (Dr), N. Mohammed^b (Mlle), T. Inage^a (Dr), N. Bernards^a (Dr), K. Yasufuku^{*a} (Pr)

^a Division of Thoracic Surgery, Toronto General Hospital, University Health Network, Toronto, CANADA ; ^b Latner Thoracic Research Laboratories, University Health Network, Toronto, CANADA

Background: Rapid on-site cytologic evaluation (ROSE) is beneficial in providing an immediate evaluation for sample adequacy on endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA). However, the availability of ROSE is not widespread. We hypothesized that a biomarker-based sample adequacy assessment could provide a simple alternative to ROSE. **Methods:** To seek biomarkers in lymph nodes, ten potential biomarkers likely to have significantly higher expression levels in lymph node tissue versus whole blood were selected *in silico*. mRNA expression levels of candidate markers were compared between whole lymph nodes and blood in the pulmonary artery taken from resected lungs. Two biomarkers that had the highest ratio in lymph nodes to blood were selected, and expression levels of the two protein markers in needle rinse solution were measured using EBUS-TBNA samples from lymph nodes. The predicting performance of two biomarkers for the adequate sampling was evaluated compared to ROSE. **Results:** Quantitative polymerase chain reaction showed that C-X-C motif chemokine ligand 13 (CXCL13) and C-C motif chemokine ligand 21 (CCL21) showed the highest fold increase at 19- and 4- fold increased expression in lymph node tissue (n=10) versus blood samples (n=13). In EBUS-TBNA samples (n=49), both CXCL13 and CCL21 protein levels were significantly elevated in adequate samples compared to inadequate samples including specimens with low cellularity in the final pathological assessment (CXCL13, 43.7±64.4 vs 1.1±2.0 pg/mL, $p=0.0004$; CCL21, 513.3±245.4 vs 214.3±101.3 pg/mL, $p<0.0001$). As univariate predictors of adequate samples, CXCL13 and CCL21 biomarkers performed well, with an area under the receiver operating characteristic curve of 86% and 88%, respectively. ROSE and the biomarker-based approach showed equivalent sensitivity 96% for predicting samples with adequate diagnostic material in the final pathological assessment. **Conclusion:** Measuring CXCL13 and CCL21 protein levels in EBUS-TBNA samples performs equally well as ROSE in the determination of adequacy yield for diagnostic purposes.

Disclosure of funding source(s):

Funding was provided through the William Coco Chair in Surgical Innovation for Lung Cancer.

Abstract #197

Therapeutic efficacy of silicone stent in subglottic stenosis

W. Rao^a (Dr), S. Li^a (Dr), Z. Su^{*a} (Dr)

^a *The First Affiliated Hospital of Guangzhou Medical University, Department of Pulmonary and Critical Care Medicine, Guangzhou, CHINE*

Background: Due to the special location of subglottic stenosis, surgical treatment is prone to cause recurrent laryngeal nerve palsy and other complications. A stent implantation is implemented as a method for treating subglottic stenosis, but its efficacy and safety are still unclear.

Objective: To investigate the safety and efficacy of silicone stents in the treatment of subglottic stenosis.

Method: Twenty-five patients with subglottic stenosis (Meyer-Cotton grade III-IV), who underwent fluoroscopically guided placement of silicone stents were recruited and studied, in terms of etiology, clinical efficacy, and related complications.

Results: Twenty-five patients received 32 silicone stents implantation. Stents removal was achieved in 8 patients who were intolerant to stents placement. The duration of stent placement was 523.5 days (range 24-748 days). After stent removal, airway caliber was increased and airway obstruction was symptomatically relieved in all patients. The effective rate was 70% while the failure rate was 5%. Stent-related complications occurred in 20 (84%) patients, including granulation tissue (n=10, 45.5%), mucus plugging (n=10, 45.5%) and stent migration (n=2, 9%) during the median follow-up time of 379 days. Greater than one-grade improvement in Hugh-Jones classification was seen in patients after stent removal.

Conclusion: Silicone stents implantation is safe and effective in treating subglottic stenosis. Whereas, the stent-related complications should be processed promptly and received follow-up with intensive observation.

Disclosure of funding source(s): none

Abstract #198

EBUS phantom fabrication for clinical training

E. Maneas^{*a} (Dr), R. Thakrar^b (Dr), N. Navani^a (Dr), A. Desjardins^a (Pr)

^a University College London, London, ROYAUME-UNI ; ^b University College London Hospitals, London, ROYAUME-UNI

Background: Endobronchial ultrasound (EBUS) requires considerable training to attain proficiency in navigation and ultrasound image interpretation. Tissue-mimicking phantoms are essential for training in bronchoscopy as they replicate aspects of human anatomy and are well-suited for learners to gain necessary procedural skills. However, there are limitations in currently available EBUS training models, which include limited anatomical complexity, prohibitive costs, and incompatibility with needle insertions. Here, we present a new framework for developing anatomically realistic EBUS phantoms that are designed for mediastinal lymph node sampling.

Methods: The bronchial tree was extracted from anonymised patient Computed Tomography data. Computer aided design software was used for post-processing of the segmented structures. Lymph node structures of various sizes were created with 3D-printed moulds and tissue-mimicking materials (TMMs) with soft mechanical properties based on polyvinyl alcohol. Additives were added to imbue the TMMs with ultrasonic scattering at concentrations that were specific to different tissue structures. Lymph node structures were positioned adjacent to the bronchial tree to create training models for mediastinal staging. Phantom evaluation included correct identification and aspiration of lymph nodes of the paratracheal, subcarinal and hilar regions.

Results: The fabricated EBUS phantoms had realistic endobronchial and acoustic appearances. Lymph nodes appeared as homogenous, hypoechoic structures with distinct margins that could be readily differentiated from the relatively hyperechoic surrounding TMM mimicking lung parenchyma. Needles could clearly be visualised, and the phantoms allowed for practicing multiple aspirations of lymph nodes as needle tracks were not visible due to the unique self-healing property of the material.

Conclusion: This study addresses a prominent gap in EBUS training with novel methods for fabricating anatomically realistic lung phantoms. The framework developed in this study will lead to high-performance training phantoms that have strong potential to improve EBUS training.

Disclosure of funding source(s):

This work was funded by the Wellcome (203145Z/16/Z) and the Engineering and Physical Sciences Research Council (NS/A000050/1) in the United Kingdom.

Abstract #199

Clinical predictor for prognosis of bronchial thermoplasty in treating severe asthma

S. Zhuquan^a (Dr), L. Shiyue^a (Pr)

^a *The First Affiliated Hospital of Guangzhou Medical University, Guangzhou, CHINE*

Objective: To explore the clinical indicators for predicting the curative effect of bronchial thermoplasty (BT) in the treatment of severe asthma.

Methods: Patients diagnosed with severe asthma and treated with BT were enrolled in this study. The demographic characteristics, ACQ score, peripheral blood eosinophil, FeNO, induced sputum, lung function test, as well as endotracheal optical coherence tomography (EB-OCT) and BT activation number were collected and analyzed. All the recruited subjects received 2 years follow-up visit after BT treatment and divided into the “effective group” and “ineffective group”.

Results: A total of 30 patients with severe asthma were enrolled, 22 patients in the effective group and 8 cases in ineffective group. Triglycerides (1.15 ± 0.34 mmol/L v.s. 1.73 ± 0.81 mmol/L), body weight (60.8kg v.s. 72.6kg), BMI (23.6 ± 2.9 v.s. 26.1 ± 2.9), FeNO (24.5 ± 15.6 v.s. 48.6 ± 30.4), lung function parameters (Fres: 17.16 ± 5.42 v.s. 11.78 ± 3.99 , X5: -0.17 ± 0.07 v.s. -0.08 ± 0.04 , AX: 0.97 ± 0.89 v.s. 0.31 ± 0.25 , RV: v.s. 1.84 ± 0.50 , RV/TLC: 45.08 ± 9.26 v.s. 35.18 ± 9.12), as well as EB-OCT parameters (medium-sized airway wall area percentage, Aw%3-6) were significantly different between effective and ineffective group. Whereas, there was no notable difference in gender, age, onset age, sinusitis, eosinophil count, spirometry (FEV1, FVC) and BT activation number between the two groups. ROC analysis was conducted to predict the BT efficacy: Aw%3-6 (AUC=0.744), FeNO (AUC=0.700), X5 (AUC 0.861), RV/TLC (AUC 0.762) and BMI (AUC=0.756).

Conclusion: IOS, FeNO and EB-OCT, but not BT activation number, could be conducive to predict the efficacy of BT treatment and screen suitable asthmatic cases. Patients with overweight and/or hyperlipidemia might serve as risk factors affecting the efficacy of BT.

Disclosure of funding source(s): none

Abstract #200

US-guided injection tool testing for navigation bronchoscopy mediated sentinel lymph node procedure

D. Ter Woerds^a (Mlle), R. Verhoeven^a (Dr), S. Van Der Heide^a (M.), A. Verhagen^a (Pr), E. Aarntzen^a (Dr), E. Van Der Heijden^a (Dr)

^a Radboudumc, Nijmegen, PAYS-BAS

Introduction: When early-stage lung cancer preferably treated by surgical resection or targeted radiotherapy. Despite their curative intent, recurrence rates are still high. The implementation of a sentinel lymph node (SLN) procedure could possibly increase staging accuracy by identifying nodes that are most likely to harbour metastasis. A successful SLN procedure is defined by drainage of a tracer to tumour-draining lymph node(s). We investigated the feasibility of an endobronchial SLN procedure by performing multiple injections of a tracer in human ex-vivo lung cancer specimens.

Methods: Ten specimens were acquired of patients who underwent surgery for a lung tumour. Specimens were peri- or intratumourally injected with ^{99m}Tc-ICG-nanocolloid (GE Healthcare, USA) using a dose escalation protocol. For injection, an intravascular catheter that combines radial ultrasound (US) visualization with a curved 25.5G needle was used (Philips B.V., the Netherlands). We aimed to determine feasibility of multi-depot injection in and around different tumour types and visibility of these depots on SPECT/CT-imaging.

Results: Of ten specimens, two were ground glass opacities (GGOs) and eight were solid tumours. The median tumour size was 30 mm (range 16-64 mm). Intratumoural US-guided injections were successful in 100% of GGOs and 64.3% of solid tumours. All performed peritumoural US-guided injections in solid tumours were successful. An average total volume of 0.7 ml (range, 0.3-1.2 ml), distributed over an average of 4 injections (range, 3-6 injections) with an average total radioactivity of and 89.5 MBq (range, 35.4-188.0 MBq) were performed. 77.7% of all injected depots could be identified individually on SPECT/CT-images.

Conclusion: Performing a SLN procedure using an endobronchial US-guided injection-catheter seems best feasible when the tracer is injected in a peritumoural fashion. Further research will verify the clinical applicability, lymphatic tracer-drainage for SLN detection and its added value.

Disclosure of funding source(s):

This work or part of this work was supported by departmental unrestricted research grants from Philips, Johnson & Johnson, Astra Zeneca Oncology Netherlands, Pentax Medical Europe.

Abstract #201

The Effectiveness And Safety Of Intrapleural Urokinase Combined With Medical Thoracoscopy For Complicated Parapneumonic Effusions And Empyema

X. Xie^{*a} (Pr), X. Li^a (Pr), X. Li^a (Pr), X. Wang^a (Pr), J. Luo^a (Pr), C. Wei^a (Mme), J. Liu^a (Mme)

^a *The First People's Hospital of Neijiang, Neijiang, CHINE*

Objectives: to assess the effectiveness and safety of intrapleural urokinase combined with Medical Thoracoscopy for Complicated Parapneumonic Effusions (CPE) and Empyema

METHODS: We conducted a single-center, prospective Parallel-controlled trial to determine whether intrapleural urokinase combined with Medical Thoracoscopy improve outcome and reduce the need for surgery in patients with Complicated Parapneumonic Effusions (CPE) and Empyema. The study enrolled patients from May 2020 to April 2021. Subjects were allocated into an intrapleural urokinase (UK) group, Medical Thoracoscopy (MT) group, and normal saline (NS) group, intrapleural urokinase combined with Medical Thoracoscopy (UK+MT) group. The primary outcome was efficacy. Secondary outcomes included the length of the duration of pleural effusion following any intervention, the need for surgery, and adverse events.

Results:

Forty-two patients with CPE or empyema were allocated to receive NS (12 patients), MT (20 patients), UK (5 patients) or UK-MT (5 patients) separately. The efficacy was 5/12 (41.6%) for NS group and 3/5 (60%) for the UK group and 15/20 (75%) for the MT group and 5/5 (100%) for the (MT +UK) group, ($P < 0.01$). The mean length of the duration of pleural effusion was (22.5 ± 4.2) d for the NS group and (13.5 ± 2.9) d for the UK group and (11.1 ± 1.8) d for the MT group and (10.9 ± 1.5) d for the (MT +UK) group; ($P < 0.01$). Two patients required surgical intervention only in NS group. There was no difference in mortality or adverse events in each group.

Conclusion: intrapleural urokinase combined with Medical thoracoscopy for complicated parapneumonic effusion or empyema is efficacy and safe. They may shorten the length of the duration of pleural effusion, reduce the need for surgery and the duration of the hospital stay in selected patients compared with any therapy separately.

Reference:

1. Bedawi EO, Hassan M, Rahman NM. Recent developments in the management of pleural infection: a comprehensive review. *Clin Respir J.* 2018;12(8):2309-20.

Disclosure of funding source(s): none

Abstract #202

CONCORDANCE BETWEEN ROSE AND DEFINITIVE CYTOLOGICAL DIAGNOSIS OF BRONCHIAL BRUSHING IN THE PERIPHERAL LUNG NODULE STUDY

L. Mendez Mangas^a (Mme), N. Espejo Herrera^b (Mme), M. Diez Ferrer^a (Dr), P. Trias Sabria^a (M.), A. Marin Muñiz^a (M.), M. Hernandez Argudo^a (M.), M. Plana Pes^a (M.), N. Baixeras Gonzalez^a (Mme), S. Santos Perez^a (Dr), I. Catala Costa^a (Mme), R. Lopez Lisbona^a (Mme)

^a Bellvitge University Hospital, Hospitalet De Llobregat, ESPAGNE ; ^b Vic University Hospital, Vic, ESPAGNE

Background: Diagnosis of peripheral pulmonary nodules (PPN) has improved with new endoscopic techniques such as navigation systems, thin/ultrathin bronchoscopes and radial EBUS. Bronchial brushing is one of the most used techniques for obtaining samples in these cases. Rapid “on site” cytological diagnosis (ROSE) has been validated in linear EBUS, but it is not routinely used for samples obtained by brushing. The objective of this study was to assess the concordance of the diagnoses of brushing ROSE, brushing definitive cytology and bronchial biopsy.

Methods: Retrospective study including 100 consecutive patients under study for PPN in the Respiratory Endoscopy Unit of the Bellvitge University Hospital in 2020.

Results: 137 samples from 100 patients were analyzed. Most procedures were performed with a thin bronchoscope 77 (56.2%) and different techniques were combined to try to improve sample collection: ultrathin bronchoscope in 23 (16.85%), radial EBUS in 57 (41.6%), fluoroscopy in 27 (19.7%) and navigation system in 13 (9.5%) depending on the PPN. Only 9 lesions were endoscopically visible, 6 by thin bronchoscope and 3 by ultrathin.

Brushing was performed in all cases. Biopsy (49) was only performed when brushing-ROSE was negative and the lesion was visualized by some method or when it was positive, but more sample was required for molecular markers.

The concordance between brushing ROSE and brushing definitive cytology was 89.1% (89% by flexible bronchoscope, 92.3% by thin bronchoscope and 78.3% by ultrathin). However, the concordance between the brushing ROSE and the bronchial biopsy was 35.8%. When comparing both concordances, no significant differences were found.

Conclusion: The concordance observed between ROSE and brushing definitive cytology is high, regardless of the type of bronchoscope used. Including ROSE in the PPN diagnostic algorithm could improve performance and reduce procedure times. Prospective studies are required for confirmation.

Disclosure of funding source(s): none

Abstract #203

Tracheal Hamartoma presenting with critical airway obstruction.

H. Kalsi^a (Dr), R. Thakrar^a (Dr), R. Khuroyia^a (Dr), N. Navani^a (Dr), J. George^a (Dr)

^a University College London Hospitals NHS Foundation Trust, London, ROYAUME-UNI

Background

Primary tracheal tumours are rare and account for <0.1% of all pulmonary tumours¹. They are typically malignant and present with varying degrees of respiratory distress. Undiagnosed slow growing tumours may mimic respiratory diseases such as COPD, however harmful consequences may arise eventually resulting in critical airway obstruction.

Case Report

A 68-year-old smoker with COPD presented with acute haemoptysis and stridor. He reported persistent wheeze and progressively worsening dyspnoea over the last year despite repeated courses of antibiotics, steroid, and inhaler therapy. He failed to respond to the same initial treatment in the Emergency Department, prompting a chest CT scan. This disclosed a tracheal mass causing near complete luminal obstruction, so he was immediately referred to our interventional bronchoscopy service. Rigid bronchoscopy demonstrated a large mobile soft tissue mass causing >80% luminal obstruction arising from a narrow base on the lower tracheal wall. Mechanical debulking was performed using rigid forceps and cryo-debridement; a 980nm semiconductor Laser was used to resect any residual tissue. Histology showed tumour fragments of mature adipose tissue, seromucinous glands and mucin filled cystically dilated duct-like structures, in keeping with a tracheal hamartoma. Following initial intervention, he made a rapid recovery with no further acute respiratory symptoms. Surveillance bronchoscopy and biopsy at 12 months showed no evidence of recurrence.

Conclusion

Hamartomas are the most common benign tumour of the lung, with 10-20% occurring endobronchially². Tracheal hamartomas are extremely rare with few cases reported in the literature. Patients may present with non-specific respiratory symptoms preventing timely diagnosis and differential diagnosis should be considered, particularly when symptoms are refractory to medical treatment. Bronchoscopic intervention and ablation remains a safe appropriate therapy with low risk of tumour recurrence.

References

1. Primary tracheal tumours. Macchiarini 2006, PMID16389188, DOI:10.1016/S1470-2045(05)70541-6
2. Management of endobronchial hamartoma. Odile 2003, PMID12778997.

Disclosure of funding source(s): none

Abstract #204

Comparison of morphologic abnormalities in patients with asthma and COPD evaluated by endobronchial optical coherence tomography

S. Zhuquan^a (Dr), L. Shiyue^a (Pr)

^a *The First Affiliated Hospital of Guangzhou Medical University, Guangzhou, CHINE*

Objective: To compare the airway structural characteristics between asthma and COPD in transverse and longitudinal section.

Methods: We performed endobronchial optical coherence tomography (EB-OCT) measurement in 19 cases with asthma, 30 with COPD and 22 control subjects. Airway wall thickness and luminal caliber from the 3rd to 9th generation of bronchi assessed by EB-OCT were compared, respectively. The clinical characteristics, CT scan and lung function test were collected and analyzed.

Results: There was no significant among-group difference in terms of age, gender and BMI (all $P>0.05$). Patients with asthma and those with COPD had significant smaller airway caliber (Ai), and greater airway wall thickening (Aw%) compared with control subjects (all $P<0.05$). Asthmatic patients presented notable medium-sized and small airway narrowing than COPD (Ai 5-6: 4.54 ± 1.33 v.s. 6.00 ± 2.10 , $P=0.044$; Ai7-9: 2.48 ± 0.70 v.s. 3.52 ± 1.19 , $P=0.006$). Whereas, the magnitude of small airway remodeling/thickening (Aw%7-9), but not medium-sized airway (from the 3rd to 6th generation of bronchi) in patients with asthma was greater than that in COPD (51.06 ± 5.13 v.s. 44.98 ± 8.04 , $P=0.027$).

Conclusion: Asthmatic airway morphological abnormalities involved medium and small airways, while airway remodeling presented more evident in small airways in COPD patients. Patients with asthma had greater magnitude of small airway remodeling than those with COPD, which might be conducive to distinguish among asthma, COPD, and further, asthma and COPD overlap.

Disclosure of funding source(s): none

Abstract #205

Obstructive fibrinous tracheal pseudomembrane -a rare cause of post extubation stridor

JK. Patra^{*a} (Dr), M. Pattanaik^a (Pr), BP. Trilochan^a (Dr), OK. Jha^a (Dr)

^a DEPARTMENT OF PULMONARY MEDICINE , SCBMCH, Cuttack, INDE

Background:

Post-extubation stridor is defined as presence of an inspiratory noise following extubation. It is a consequence of narrowing of the airway, resulting in an increased effort of breathing.

Case Report:

A 61 year old male admitted with high grade fever, dry cough, dyspnea on exertion and stridor for 2 days. He was admitted in a hospital 20 days back for acute coronary syndrome. After CAG and PTCA, patient developed acute pulmonary edema and was intubated and mechanically ventilated for 5 days. On examination patient was tachypneic ,pulse rate - 106/min, Resp rate - 30/min, BP - 164/90 mmHg, SP2 - 90% with audible stridor . On auscultation there was bilaterally decreased vesicular breath sound. Provisionally diagnosed as a case of Post intubation tracheal stenosis. Routine tests revealed anemia, leucocytosis, neutrophilia ,hyperglcemia. Chest Xray was normal .CT thorax showed short segment irregular tracheal wall thickening(5-6 mm) with moderate luminal stenosis. Bronchoscopy revealed subglottic and tracheal membranous tenacious mucus encircling the lumen which was dislodged and removed by bronchoscope and biopsy forceps. Tracheal wall was hyperemic and edematous. Finally diagnosed as **Obstructive Fibrinous Tracheal Pseudomembrane(OFTP) with Tracheitis.**

Conclusion:

OFTP is an uncommon complication of endotracheal intubation. Symptoms are nonspecific and can mimic as laryngeal spasm, laryngeal edema , vocal cord palsy, vocal cord dysfunction, heart failure, and retention of tracheobronchial secretions. Delay in making diagnosis may result in respiratory failure that requires re-intubation and occasionally lead to death. Treatment involves confirmation by flexible bronchoscopy and removal of the membrane using either rigid or flexible bronchoscopy.

Disclosure of funding source(s): none

Abstract #206

Unusual Foreign Body Aspiration in a 12 Year old Boy

JK. Patra^a (Dr), M. Pattanaik^a (Pr), OK. Jha^a (Dr)

^a DEPARTMENT OF PULMONARY MEDICINE, SCBMCH, Cuttack, INDE

Introduction:

Foreign-body aspiration is a relatively common occurrence in children. It may present as a acute respiratory failure which is life-threatening that requires invasive mechanical ventilation followed by prompt removal of the foreign body.

Case Report:

A 12 years old boy presented with cough and breathlessness of acute onset. On enquiring parents gave a history of live fish aspiration while the boy was playing with it. In view of respiratory failure, patient was admitted to Respiratory ICU and put on invasive mechanical ventilation after intubating with a 7mm sized endotracheal tube under midazolam. In spite of volume control ventilation with FiO₂ of 100%, the patient hardly achieved SpO₂ of 85%. Fiberoptic bronchoscopy was carried out through endotracheal tube and observed right main bronchus intubation. The endotracheal tube was repositioned at 2cm above the carina and gradually SpO₂, heart rate and respiratory rate stabilised. A shiny foreign body was seen blocking the left main bronchus. After two hours again the patient desaturated and developed tachycardia, hypotension and tachypnea. Again the Bronchoscope was reintroduced through endotracheal tube, a fenestrated cup biopsy forcep was introduced, the foreign body was caught and removed along with the scope. Unusual foreign body was found to be a fish grasped at its mouth end.

Conclusion:

In emergency conditions and during odd hours, fiberoptic bronchoscopy with usual accessories may help for removal of foreign body and save life.

Disclosure of funding source(s): none

Abstract #207

Open safety pin removal by rigid bronchoscopy in a 19 year old boy

JK. Patra^a (Dr), AK. Sahoo^b (Dr), M. Pattnaik^c (Pr)

^a DEPARTMENT OF PULMONARY MEDICINE, SCBMCH, Cuttack, INDE ; ^b DEPARTMENT OF ANAESTHESIOLOGY, SCBMCH, Cuttack, INDE ; ^c DEPARTMENT OF CTVS, SCBMCH, Cuttack, INDE

Background: Rigid bronchoscopy has proved its utility and superiority far beyond imagination for removal of foreign body from lungs. It is very rare to find open safety pin aspirated into right main bronchus and bronchus intermedius. We report a case of rigid bronchoscopic removal of open safety pin from right main bronchus and bronchus intermedius.

Case Report: 19 year old boy presented to emergency with history of aspiration of safety pin 5 days back. Clinical examination was normal. Chest - Xray revealed a open safety pin seen in right bronchus intermedius and extending downwards and was further confirmed by right lateral view chest x-ray. After written informed consent , rigid bronchoscopy under general anaesthesia was done and open safety pin was seen in right bronchus intermedius. With help of optical grasping forceps , the sharp end was tried to grasp. Multiple attempts to grasp the sharp end failed as it was embedded with granulation tissue. Then the blunt end was grasped by optical grasping forceps and then retrieved into the rigid barrel. The entire assembly of rigid bronchoscopy barrel and open safety pin grasped by optical grasping forceps was removed and patient was reintubated with a 8” flexible endo-tracheal tube. A check fibre-optic bronchoscopy was done. Then patient was extubated after reversal of anaesthesia and was shifted to observation room.

Conclusion: A sharp metal foreign body in lungs is always a big challenge. Rigid bronchoscopy with optical grasping forceps under general anaesthesia is very helpful for removal of sharp foreign like open safety pin from the airways.

References:

1. Broken safety pin in bronchus- Anaesthetic considerations- NCBI, Indian journal of anaesthesia. Aditya Agarwal, Roona Shad
2. Accidental aspiration of head scarf pin in left bronchus piercing the lung parenchyma: A rare case report , Lung India, Yusuf Parvez and Mohammed Ashraf Kandath

Disclosure of funding source(s): none

Abstract #208

The diagnostic utility of ultrasound elastography to differentiate tuberculosis and sarcoidosis during endobronchial ultrasound-guided transbronchial needle aspiration (ebus-tbna)

K. Madan^a (Dr), M. Madan^a (Dr), S. Mittal^a (Dr), V. Hadda^a (Dr), A. Mohan^a (Dr), R. Guleria^a (Dr)

^a All India Institute of Medical Sciences (AIIMS), New Delhi, India, New Delhi, INDE

Introduction: Elastography is a noninvasive tool that may allow differentiation between benign and malignant lymph nodes during Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA). In TB endemic areas, clinico-radiological features of mediastinal tuberculosis (TB) and Sarcoidosis often overlap, rendering an accurate diagnosis challenging. There is interest in the identification of modalities to aid in this differentiation. There are currently no published data on the utility of EBUS-elastography in differentiating between TB and Sarcoidosis.

Methods: Subjects undergoing EBUS-TBNA were prospectively enrolled, and elastography features were observed. Subjects with definitive diagnosis of TB or Sarcoidosis were enrolled. The elastography features recorded included the three-color classification patterns and strain ratio.

Results: We enrolled 96 subjects with a definitive diagnosis (53: TB and 43: Sarcoidosis). Of the 27 patients in whom the lymph nodes were classified as Type 1 on endobronchial ultrasound elastography color pattern, 17 had a diagnosis of tuberculosis (TB) (62.9%), while 10 (37%) were Sarcoidosis. For Type 2 lymph nodes, 20/45 (44.4%) were TB, and 25/45 (55.6%) were sarcoidosis. Type 3 lymph nodes were TB in 16/24 (66.7%) and sarcoidosis in 8/24 (33.3%). In classifying Type 1 as 'sarcoidosis' and Type 3 as 'tubercular,' the sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy were 48.5 %, 55.6 %, 66.7%, 37 %, and 0.51, respectively. The strain ratio [Median (IQR)] was 1.29 (0.37-5.98) in TB, and 2.10 (0.83-4.52) in sarcoidosis group (p=0.48).

Conclusion: Ultrasound Elastographic lymph node characteristics have a limited diagnostic utility to differentiate between TB and Sarcoidosis during EBUS-TBNA.

Disclosure of funding source(s): none

Abstract #209

Photodynamic Therapy (PDT) For Advanced Lung Cancer With Airway Stenosis :

X. Xie^{*,a} (Pr), X. Li^a (Pr), X. Li^a (Pr), X. Wang^a (Pr), J. Luo^a (Pr), Z. He^a (Mme), J. Liu^a (Mme)

^a *The First People's Hospital of Neijiang, Neijiang, CHINE*

Objectives: to assess the effectiveness and safety of Photodynamic Therapy for Advanced Lung Cancer with Airway Stenosis

METHODS:

advanced lung cancer with Airway Stenosis can be treated palliatively with photodynamic therapy (PDT) combined with argon plasma coagulation(APC) or Airway stenting to remove central and peripheral (lobar or segmental bronchi) bronchial stenosis and obstruction. We present data for 4 patients with advanced non-small cell lung carcinomas in whom curative operations were contraindicated, who underwent PDT combined with APC or Airway stenting for local control of the intraluminal lesions.

Results:

In this single-institution study, The mean age was 73 years (range, 57-85 years), and the stages of cancer were IIIc-IV. The median stenosis rates before treatment, one week post-treatment, and one month post-treatment were 70% (range, 60%-90%), 15% (range, 10%-35%), and 15% (range 15%-60%), respectively. an objective response was evidenced by the substantial increase in the openings of the bronchial lumen. all patients experienced improved symptoms and quality of life at one week after treatment; The overall response rate of short-term was 100%. One patient had mild photoallergic reaction, which characterized by photosensitive dermatitis such as pruritus, Dyspnea was aggravated in 1 patient due to exfoliation of necrotic tissue and airway blockage, None of the 4 patients had PDT-related morbidity or mortality.

Conclusion : Photodynamic therapy is an effective technique for advanced lung cancer causing tracheobronchial obstruction. With debulking endobronchial tumors over an acceptably short time-course; and PDT with other therapy was useful and safe for the treatment of bronchial obstruction.

Disclosure of funding source(s): none

Abstract #210

Whole lung lavage in a case of pulmonary alveolar proteinosis in respiratory icu of a tertiary care hospital

M. Pattanaik^a (Pr), JK. Patra^{*a} (Dr)

^a DEPARTMENT OF PULMONARY MEDICINE, SCBMCH, Cuttack, INDE

BACKGROUND: Whole lung lavage is performed primarily for the treatment of Pulmonary alveolar proteinosis. The procedure involves intubating a patient with a double lumen endotracheal tube and ventilating a single lung while performing a large volume (upto 20 L) lavage of the nonventilated lung and clearing the abnormal proteinaceous material from the alveoli¹.

CASE REPORT: 48 years hindu female, housewife, presented with increased shortness of breath - 2 months, fever - 10days, dry cough - 10days. She was concious , tachypneic , spO₂ - 58 % with room air. On chest examination bilateral VBS with fine inspiratory basal crackles were heard .Chest X -ray revealed symmetric, bilateral alveolar opacities. HRCT thorax showed crazy-paving pattern. Bronchoscopy revealed normal endobronchial mucosa and BAL fluid was milky white appearance. PAS staining of BAL fluid confirmed the diagnosis of PAP . Whole lung lavage was done in Respiratory ICU under general anaesthesia with double lumen endotracheal tube intubation. First right lung was lavaged with 11.5 litres of sterile warm saline and 9.8 litres of lavaged fluid was retrieved by manual chest percussion and suction. Post procedural care was done and patient was extubated after 2 days. After 2 weeks whole lung lavage was done for left lung and patient was discharged with a spO₂ of 95 % with room air.

CONCLUSION: Whole lung lavage is a safe and an effective procedure in symptomatic patients with all forms of PAP. Complications from the procedure are minimal, when performed in centres with adequate resources and experience with single lung ventilation.

REFERENCES

1. A. Ernst and F.J.F. Herth , Principles and Practice of Interventional Pulmonology
2. Michaud G, Reddy C, Ernst A. Whole lung lavage for Pulmonary alveolar proteinosis. Chest .2009;136:1678-81

Disclosure of funding source(s): none

Abstract #211

Alveolar macrophage function correlated with small airway remodeling in COPD

M. Fan^a (Dr), S. Li^a (Pr), Z. Su^{a*} (Dr)

^a *The First Affiliated Hospital of Guangzhou Medical University, Department of Pulmonary and Critical Care Medicine, Guangzhou, CHINE*

Background: Chronic obstructive pulmonary disease (COPD) is characterized by airway inflammation and remodeling, small airway lesions are the most obvious and earliest involved. However, the association between airway inflammation and airway remodeling remains unclear.

Objective: To explore the correlation of alveolar macrophages (AM) with small airway structure and its potential role in COPD pathogenesis.

Methods: We performed endobronchial optical coherence tomography (EB-OCT) and bronchoalveolar lavage (BAL) from patients with COPD, heavy-smokers with small airway disorders and healthy controls. The luminal area (Ai) and airway wall area% (Aw%) from the 3rd to 9th generation of bronchi were measured using EB-OCT. BAL cells were stained with anti-CD68 for total macrophages, anti-CD163 for M2, and anti-CD68 for M1 macrophages, respectively. Multiplex ELISA was conducted to measure cytokines in BALF (IL-1 β).

Results: Patients with COPD had higher expression of IL-1 β than control, but similar with that of heavy smokers (2.5 \pm 0.6 vs 11.1 \pm 4.5 vs 4.8 \pm 0.3). The M1/M2 ratio were comparable among COPD, heavy-smoker and control (78.3 \pm 37.5 vs 189.0 \pm 89.0 vs 6.9 \pm 4.2). Further, the EB-OCT measurement indicated that patients with COPD had greater small airway wall thickening (Aw%7-9), but not smaller airway caliber (Ai7-9), than that in heavy-smokers and control subjects (43.8 \pm 0.8 vs 33.1 \pm 7.4 vs 55.3 \pm 5.5). It was worth noting that Aw%7-9, rather than Ai7-9, was negatively associated with M1/M2 ratio ($r=0.888$, $P=0.001$), whereas the correlation with IL-1 β did not achieve statistical difference.

Conclusion: The magnitude of small airway remodeling, assessed by EB-OCT measurement, was correlated with the phenotype and function of alveolar macrophage in patients with COPD.

Disclosure of funding source(s): none

Abstract #212

Comparing mortality rates in COVID patients requiring tracheostomy vs non-COVID patients requiring tracheostomy

N. Zamith^{*a} (Dr), S. Islam^a (Dr), R. Bechara^a (Dr)

^a *Medical College of Georgia - Augusta University, Augusta, Ga, ÉTATS-UNIS*

Introduction:

Tracheostomy is a frequently performed procedure in mechanically ventilated patients requiring prolonged respiratory support. Prior to the COVID-19 pandemic, studies describe benefits that include improved patient comfort, decreased nursing burden, decrease in sedation requirements, faster weaning from mechanical ventilation, lower risk of ventilator associated pneumonia, and lower mortality, just to name a few. During the COVID-19 pandemic, there was a dramatic increase in the need for prolonged mechanical ventilation. The mortality of COVID-19 patients requiring tracheostomy is yet to be elucidated. In this retrospective trial, we compare the mortality in COVID and non-COVID patients requiring tracheostomy due to prolonged respiratory support.

Patients and Methods:

In this retrospective trial, we reviewed charts of all tracheostomies performed at our institution between October 2018 and February 2022. Overall mortality at 7 days, 14 days, 21 days, and 30-day following tracheostomy was assessed in 74 COVID patients and 97 non-COVID patients.

Results:

COVID-19 patients were found to have a statistically significant higher 14-day mortality rate ($p=0.001$), 21 days ($p=0.002$), and 30-day mortality ($p=0.002$) when compared to non-COVID patients. COVID patient mortality rates were 12% at 7 days, 32% at 14 days, 36% at 21 days, and 38% at 30 days. For non-COVID patients, mortality rates were 5% at 7 days, 11% at 14 days, 15% at 21 days, and 16% at 30 days.

Conclusion:

We showed that COVID-19 patients requiring tracheostomy have a higher mortality rates when compared to non-COVID patients. Additional co-morbidities may also play a role, an analysis which we are pursuing. We suggest that benefit of prolonged ventilatory support in patients with COVID should be assessed and discussed prior to performing tracheostomy.

Disclosure of funding source(s): none

Abstract #213

A pilot study on the use of the super dimension navigation system for optimal cryobiopsy location in interstitial lung disease diagnostics

V. Luzzi^a (Dr), S. Kronberg-White^b (Dr), E. Bendstrup^b (Pr), LB. Madsen^b (Dr), V. Poletti^c (Pr), S. Tomassetti^a (Pr)

^a *Interventional Pulmology, AOU Careggi, Florence, ITALIE* ; ^b *Department of Respiratory Diseases and Allergy,, Aarhus, DANEMARK* ; ^c *Department of the Diseases of the Thorax, Forli, ITALIE*

Background

Transbronchial cryobiopsies has become increasingly important in the diagnostic workup for interstitial lung diseases. The rate of complications and mortality are low compared to surgical lung biopsies, but the diagnostic yield is not as high. The reason for the lower diagnostic yield could in some cases be explained by biopsies taken too centrally or in less affected areas. In this pilot study we examined the feasibility of using the electromagnetic navigation system, superDimension (SD), when performing cryobiopsies to increase the diagnostic yield.

Methods

Electromagnetic navigation bronchoscopy and cryobiopsies were performed using SD. An electromagnetic board placed on the back of the patient and a position sensor at the tip of the navigational probe created a real-time 3D reconstruction of previously acquired computer tomography images. The procedure was performed with the patients in general anesthesia using a rigid bronchoscope when performed in Florence and with a flexible bronchoscope through an orotracheal tube when performed in Aarhus.

Results

In total, 18 patients were included. Five patients were excluded, partly due to technical difficulties. Disposable 1.7 mm cryoprobes were used in Aarhus, and reusable 1.9 mm probes in Florence. Pneumothorax was detected in three (23%), mild hemorrhage was seen in one (8%) and moderate hemorrhage in six (46%). The biopsies contributed to the diagnosis in 11 of the patients (85%).

Conclusion

Using superDimension electromagnetic navigation system when performing cryobiopsies is feasible. A larger prospective trial is necessary to homogenize the technique between centres and to evaluate diagnostic advantage and complications.

Disclosure of funding source(s): none

Abstract #214

Auditing the impact of an interventional service on index presentations of lung cancer patients with central airways obstruction.

I. Zaki^a (Dr), P. Arooj^a (Dr), D. Crowle^a (Dr), T. Alice^a (Dr), J. Corcoran^a (Dr), A. Marchbank^a (M.), L. Telisinghe^b (Dr), T. Nicholson^a (Dr), C. Daneshvar^{*a} (Dr)

^a *University Hospitals Plymouth NHS Trust, Plymouth, ROYAUME-UNI* ; ^b *London School of Hygiene and Tropical Medicine, London, ROYAUME-UNI*

Background

In 2014 a baseline audit of endobronchial interventions in new lung cancer patients with central airways obstruction (CAO) was conducted to inform on interventional pulmonology services in our tertiary university hospital. Following a series of service developments, a repeat audit was conducted.

Method

Services changes included increased awareness of CAO, auditing and streamlining of the referral pathway, and modernisation of interventional equipment. To assess impact, new lung cancer patients presenting in 2019 and 2020 with CAO were identified. Demographics, clinical details and outcomes were recorded. Comparisons were made across the time periods.

Results

In the pooled data set, 135/1063 (12.7%) patients had CAO at presentation with 85/135 (63%) having >50% obstruction. The median age was 70.6[63.75-76.89] years and 60/135(44)% were male. Index presentation via the emergency department occurred in 32% (43/135) of patients. Performance status was <3 in 62% of cases and 61.5% had Stage IV disease. Intervention with rigid bronchoscopy was performed in 23/135(17%) cases overall. Across the group the mean survival was 175 days (SD 200). Incidence of CAO across the period was stable (13.2% 45/342, 11.6% 43/370 and 14.8% 52/351) (p=0.45), with no significant difference in survival. Rates of endobronchial intervention in patients with severe disease were 7/33(21.2%), 6/21 (28.6%), 8/31 (25.8%) in 2014, 2019 and 2020 respectively (p=0.82).

Median time from index diagnostic CT scan to rigid bronchoscopy was 23[9-72] days, 7[4.75-11] days and 16 [10-40.5] days in 2014, 2019 and 2020 respectively. Compared to 2014, the pooled 2019/2020 cohort had a non-significant shorter time to intervention - median 10 [7-25] days versus 23 [9-72] days (p=0.237).

Conclusion

The interventional service shortened time to endobronchial treatment but did not increase the number of interventions. Further work on decision making will help standardise approaches to this mixed cohort of patients.

Disclosure of funding source(s): none

Abstract #215

Radial probe endobronchial ultrasound for peripheral pulmonary lesions. Initial experience of a center during COVID-19 pandemic.

I. Duarte^{*a} (Dr), J. Rodrigues^a (Dr), D. Silva^a (Dr), D. Maia^a (Dr), AS. Santos^a (Dr), R. Gerardo^a (Dr), A. Mineiro^a (Pr), A. Miguel^a (Pr)

^a Centro Hospitalar e Universitário de Lisboa Central - Hospital Santa Marta, Lisbon, PORTUGAL

Background

Radial probe endobronchial ultrasound (RP-EBUS) is an important tool in peripheral pulmonary lesions diagnostic. The diagnostic yield depends on the lesion size and sampling tools used. In this study, we present our experience during COVID-19 pandemic.

Methods

We retrospectively reviewed data from 27 procedures (25 patients) who underwent RP-EBUS for investigation of peripheral pulmonary lesions between May 2020 and April 2022. Demographic, clinical and outcome data were collected and analyzed. Fluoroscopy was not used. Statistics was performed with SPSS 25.

Results

Twenty-five patients were included with a median age of 66 (46-88) years-old and 20 (74%) were male. RP-EBUS was used for diagnostic purposes, in 81.4% (n=22/27) suspected primary lung cancer and in 18.5% (n=5/27) suspected metastatic lesions. Median lesion size was 2.4 (1.1-8.2)cm. In 77,8% (n=21/27) cases the lesion was identified by RP-EBUS (in 57.1% concentric identification). Considering the combined results of bronchial washing, bronchial brushing, transbronchial biopsy and transbronchial needle aspiration the overall diagnostic accuracy was 59,3% (16/27) of cases. There were 68.75% (n=11/16) cases of primary lung cancer, 12.5% (n=2/16) diagnosis of tuberculosis, 6.25% (n=1/16) sarcoidosis and 6.25% (n=1/16) cryptogenic organizing pneumonia. In 40.7% (n=11/27) of the cases it was not possible to obtain a diagnosis. Of these, 27,3% (n=4/11) cases had a final diagnosis of lung cancer by transthoracic biopsy; one repeated RP-EBUS verifying the diagnosis of lung cancer; one case of sarcoidosis after mediastinoscopy and 45.5% (n=5/11) are still under investigation and/or surveillance. No major bleeding or pneumothorax was observed.

Conclusion

Although the suspected lesion was identified in the majority of cases, the diagnostic yield was low which could be related to the high frequency of eccentric lesions and to the learning curve . RP-EBUS without fluoroscopy seems to be a safe and useful procedure for the diagnosis of peripheral lung lesions.

Disclosure of funding source(s): none

Abstract #216

A comparison of single-use bronchoscopes & reusable bronchoscopes for interventional pulmonology applications

J. Kurman^{*a} (Dr), B. Benn^a (Dr), S. Islam^b (Dr)

^a *Medical College of Wisconsin, Milwaukee, ÉTATS-UNIS* ; ^b *Medical College of Georgia, Augusta, ÉTATS-UNIS*

Background

Single-use flexible bronchoscopes (SUFB) have existed for a number of years but have generally been considered to be inferior to reusable flexible bronchoscopes (RFB). As such, SUFB have largely been relegated to use in the intensive care and operating room for simpler procedures, such as airway inspection and bronchoalveolar lavage. Interventional pulmonologists have long preferred RFB given their superior operating characteristics. Recently, there has been a proliferation of new SUFB from several different manufacturers who suggest this latest generation is suitable for use during interventional pulmonology procedures.

Methods

Two sizes of SUFB from four different manufacturers were compared to their RFB counterparts using a cadaver model. Categories assessed included bending capability, scope rigidity, maneuverability, handling, optics, channel shape & size, and suction. All tests were performed by board certified interventional pulmonologists.

Results

Most of the SUFB had equivalent or superior flexion and extension compared to the RFB, even with relatively stiff instruments present in the working channel. Instruments included large forceps, loaded valve deployment catheters, various stents, biopsy needles, and dilation balloons. Many of the SUFB were able to cannulate the upper lobe apical segmental airway bilaterally, which was used to assess scope rigidity, maneuverability, and handling. Optics, as assessed by depth of field and field of view, were equivalent between the RFB and one brand of SUFB. The other SUFB were inferior in this category. Channel shape was circular for all but one brand of SUFB. Suction ability varied among the scopes but was generally within several seconds of each other.

Conclusion

The latest generation of SUFB are a significant advancement over their predecessors. Many of their attributes are comparable to or even superior to RFB. SUFB may represent a viable alternative to RFB for interventional pulmonology procedures in the bronchoscopy suite, operating room, and intensive care unit.

Disclosure of funding source(s): none

Abstract #217

Typical bronchial carcinoid tumor: A case report

JR. Acibal^{*a} (Dr), JR. Gonong^a (Dr)

^a Lung center of the philippines, Quezon City, PHILIPPINES

INTRODUCTION: Bronchial carcinoid tumors were historically defined as bronchial adenomas and were considered benign, with good clinical prognosis. Bronchial carcinoids are rare, accounting for 0.5% to 2% of lung tumors.

CASE: This is a case of a 31 year old female patient who was seen initially in a private clinic for work clearance due to incidental finding of right lung atelectasis on chest X-ray. No accompanying symptoms such as difficulty of breathing, cough, easy fatigability, weight loss and hemoptysis. Fiberoptic bronchoscopy was done which showed complete obstruction of the right main bronchus by the smooth rounded mass approximately 1.2 x 1.2cm. The patient was initially offered referral to thoracic surgeon for lobectomy, however, she initially refused and was then referred to interventional pulmonology team wherein cryoablation and cryorecanalization were performed.

CONCLUSION: Endobronchial treatment such as cryotherapy provides an alternative treatment for typical carcinoids of less than or equal to 2cm in size without lymph node involvement and metastasis elsewhere. Its minimally invasive nature in combination with locoregional advantages make it an attractive therapeutic approach for patients with intraluminal located carcinoids.

1. Yang, Z., Wang, Z., Duan, Y., & Xu, S. (2016). Clinicopathological characteristics and prognosis of resected cases of carcinoid tumors of the lung. *Thoracic Cancer*, 7(6), 633-638. <https://doi.org/10.1111/1759-7714.12377>
2. Md, B. V., Md, J. E. D., Jr, T. K. E., Md, S. L. C., Md, K. S. F., Md, L. S. M., Md, R. S. D., & Md, M. G. B. (2021). *Murray & Nadel's Textbook of Respiratory Medicine, 2-Volume Set (Murray and Nadel's Textbook of Respiratory Medicine)*(7th ed.). Elsevier.
3. Papaporfyriou, A., Domayer, J., Meilinger, M., Firlinger, I., Funk, G.-C., Setinek, U., Kostikas, K., & Valipour, A. (2021). Bronchoscopic diagnosis and treatment of endobronchial carcinoid: case report and review of the literature. *European Respiratory Review*, 30(159), 200115. <https://doi.org/10.1183/16000617.0115-2020>

Disclosure of funding source(s): none

Abstract #218

A Meta-analysis on Utility of Bronchoscopy in the Investigation of Lung Cancer in Patients with Haemoptysis and a Normal CT Thorax.

A. O'Mahony^a (Dr), M. Kennedy^{*a} (Dr)

^a Cork University Hospital, Cork, IRLANDE

Background: In patients with haemoptysis, many healthcare systems support bronchoscopy regardless of CT findings. However, recent studies suggest that CT alone could be sufficient to rule out lung cancer in patients with haemoptysis. This has never been systematically assessed.

Methods: A systematic search was performed of the following databases: EBSCO (Medline), PubMed, Academic Search Complete, CINAHL, Cochrane Library and Embase. Key search terms used were "haemoptysis," "lung cancer," "CT scan" and "bronchoscopy". The studies identified were screened using predefined inclusion and exclusion criteria. The QUADAS-2 tool on RevMan was used to assess the quality of studies. Meta-Disc 1.4 software was used to test for heterogeneity and to summarise the test performance characteristics using forest plots and summary receiver operating characteristic (SROC) curves. SPSS was used to compare the diagnostic accuracy of CT and bronchoscopy.

Results: A total of 14 studies (2,960 patients) were included. The pooled sensitivities for detection of lung cancer using CT scan and bronchoscopy were 0.99 (95% CI: 0.97-1.00) and 0.84 (95% CI: 0.78 - 0.88) respectively. The sensitivity of CT was higher than that of bronchoscopy ($P < 0.001$). The pooled specificities for CT scan and bronchoscopy were 0.99 (95% CI: 0.99-1.00) and 1.00 (95% CI: 0.99 - 1.00) respectively. Of 2960 patients studied 257 had lung cancer (8.7%). 254 of these had a CT thorax and CT scan was false negative in 4/254 (1.6%) with bronchoscopy only identifying one cancer with a normal CT (0.4%)

Conclusion: CT scan showed a higher diagnostic accuracy than bronchoscopy. The study indicated that bronchoscopy offers insignificant additional value in the investigation of lung cancer in patients with haemoptysis and a negative CT scan.

Disclosure of funding source(s): none

Abstract #219

Mediastinitis as Complication of EUS-B FNA

E. Tashi^{*a} (M.), S. Golgota^a (M.), D. Xhemalaj^a (Dr), P. Kapisyzi^a (Pr), S. Bala^a (Pr)

^a *University Hospital Shefqet Ndroqi, Tirana, ALBANIE*

Background

The combination of EBUS-TBNA and EUS-B FNA are used in diagnosis of mediastinal pathologies. EBUS-TBNA is a safe procedure with an overall complication rate less than 2%. Mediastinal cystic lesions account for 12% to 18% of primary mediastinal tumors, with bronchial cysts being the most common (40%) [1]. The accuracy of CT in the diagnosis of mediastinal cysts was reported to be only 53.8%, [2]

Case report.

A 60 year old patient was hospitalised due to finding of a posterior mediastinal chest mass. The patient history is cough for many months. After taking several courses of medications no improvement was noted and was referred for further diagnosis. Laboratory findings and flexible bronchoscopy were in normal range. Flexible bronchoscopy was normal. In chest CT a 4 cm round mass in contact with oesophagus and pericardium was noted. No calcification or destruction were noted. Histologic diagnosis was requested. EUS - B FNA was conducted with 3 passages. Patient was discharged the following day. After 48 hours patient developed fever and chest pain. Intravenous tazobactam and vancomycin was begun. A Chest CT was conducted. There was annular enhancement of contrast (capsule) and increased in size of the mass. After 4 days clinical status deteriorated with fever, chest pain, difficulty in breathing and dyspnea. Patient was referred for thoracotomy and a 11 cm encapsulated mass was removed. Culture resulted positive for streptococcus and pseudomonas. Cytology of the mass showed matured lymphocytes and no malignant cells

Conclusion.

Due to the rare nature of mediastinal cysts, there is still little evidence to guide management, and clinical recommendations are mostly derived from case reports. [3] For symptomatic mediastinal cysts, it is agreed that surgical removal of the cyst is a more reasonable option, while the choice of treatment for asymptomatic patients still remains controversial

Disclosure of funding source(s): none

Abstract #220

Obstructive sleep apnea during bronchoscopy: Risk factors and the role of NIMV

K. Bakiri^{a*} (Dr), N. Anagnostopoulos^a (Dr), K. Cholidou^a (Dr), E. Koukaki^a (Dr), E. Theodorakis^b (Dr), A. Vontetsianos^a (Dr), A. Koutsoukou^a (Pr), G. Stratakos^a (Pr)

^a *Interventional Pulmonology Unit and ICU of the 1st Respiratory Medicine Department National and Kapodistrian University of Athens, "Sotiria" Hospital, Athens, GRÉCE* ; ^b *Thoracic Surgery Department, "Sotiria" Hospital, Athens, GRÉCE*

Background: The use of drug induced sleep endoscopy (DISE) has been applied to predict obstructive sleep apnea (OSA). Given that moderate sedation for bronchoscopy may induce moderate obstruction in sleep apnea patients and is associated with desaturation, NIMV could be used to prevent respiratory complications and severe hypoxemia. Moreover NIMV has not been extensively tested during bronchoscopy in patients with known OSA.

Methods: 60 patients (57% males) with mean age of 66 years and mean body mass of index (BMI) of 27kg/m² who required bronchoscopy were enrolled in the study. After randomization, 14 patients with high suspicion for OSA were received NIMV during bronchoscopy and 16 patients received conventional oxygen supplementation with nasal cannula. 30 patients with low suspicion for OSA were under conventional oxygen supply. The primary end points were snoring and episodes of decline in SpO₂<90%. Secondary endpoints were the changes in the respiratory and hemodynamic parameters during bronchoscopy and the need of early termination and/or endotracheal intubation.

Results: During bronchoscopy, snoring and desaturations were significantly higher in patients with high suspicion for OSA. Under NIMV O₂ saturation significantly improved, no patient required endotracheal intubation and the whole procedure was well-tolerated.

Conclusion: In patients with high suspicion for OSA, NIMV was superior to the conventional oxygen supply in preventing SPO₂ decrease and cardiovascular/ hemodynamic compromise.

Disclosure of funding source(s): none

Abstract #221

New perspectives on timing towards tracheostomy among critically ill covid-19 patients : role of pressure support ventilation.

J. Saullo^{*a} (Dr), I. Carboni Bisso^a (Dr), C. Lockhart^a (Dr), I. Fernandez Ceballos^a (Dr), J. Cantos^a (Dr), I. Huespe^a (Dr), M. Las Heras^a (Dr)

^a *Hospital Italiano de Buenos Aires, Capital Federal, ARGENTINE*

Background: The optimal time to perform a tracheostomy (TQT) in patients with COVID-19 has been the object of study but still remains in debate. The current study examined the hypothesis that patients with tracheostomy due to COVID-19 who made a Pressure support ventilation (PSV) before the TQT regardless of the day of the procedure present more mechanical ventilation free days (VFD ´s) in relationship with patients who didn't. **Materials and methods:** A single-center analytical retrospective cohort study of critically ill adult patients with COVID-19 undergoing elective tracheostomy. Participants were recruited between March 15th of 2020 and June 6th of 2021. The main outcome was ventilator free days . **Results:** during the study period, 338 patients were admitted to the ICU for COVID-19, 244 required invasive mechanical ventilation, 107 underwent percutaneous tracheostomy. Patients who performed PSV prior to TQT had 20 VFD ´s and a median of 36 days of mechanical ventilation (IQR 30-46.8) and patients who performed PSV after TQT had 18 VFD ´s and 37 (IQR 30-46) days of mechanical ventilation. In the Fine and Gray analysis, the sHR of patients who underwent PSV after TQT was 1.05 (95% CI 0.66-1.69) and adjusted for confounders was 1.01 (95% CI 0.43-2.36). **Conclusion :** the PSV realization before the tracheostomy regardless of the day of the procedure, has no statistical significance in terms of mechanical ventilation free days in relationship with patients who didn't.

Disclosure of funding source(s): none

Abstract #222

CENTRAL ENDOBRONCHIAL HAMARTOMA RESECTED BY CRYOSURGERY

O. Nuredini^{*a} (Dr), I. Peposhi^a (Dr), H. Hafizi^a (Pr), A. Teferici^a (Dr), P. Kapisyzi^a (Pr)

^a University Hospital "Shefqet Ndroqi", Tirana, ALBANIE

Abstract

Introduction: Pulmonary hamartoma is a benign lung neoplasm and it comprises 6% of solitary pulmonary nodules. Two clinical types have been defined according to its location: intraparenchymal (90%) and endobronchial (10%).

Case Presentation: We report a 32-year old female patient who presented with a 5-6 years with shortness of breath and wheezing, misdiagnosed as having asthma. CT scan showed a lesion in the right main bronchus, and bronchoscopy confirmed the presence of an endobronchial tumor. This lesion was completely excised with bronchoscopy by cryosurgery. Biopsy confirmed to be a chondromatous hamartoma

Discussion: The incidence of pulmonary hamartoma in the general population is 0.25%. Pulmonary hamartomas are usually asymptomatic in contrast, endobronchial hamartoma is often symptomatic, and the most common complaints of patients are hemoptysis and obstructive pneumonia. The management of endobronchial hamartoma must be individualized according to the characteristics of each patient and the location of the tumor.

Conclusion: CT scans and bronchoscopy is valuable investigations and should be performed in any older patients with a prolonged picture of late-onset asthma. Flexible bronchoscopy is adequate tissue sample for diagnosis of benign tumors. A rigid bronchoscopy and biopsy/removal of the mass are the treatments of choice.

Key Words: Endobronchial lesions, chondroid hamartoma, Cryosurgery, Therapeutic bronchoscopy.

REFERENCES

1. McDonald JR, Harrington SW, Clagett OT. Hamartoma (often called chondroma) of the lung. J Thorac Surg. 1945;14:128-143.
2. Minasian H. Uncommon pulmonary hamartomas. Thorax. 1977; 32:360-364.
3. Kiryu T, Kawaguchi S, Matsui E, et al. Multiple chondromatous hamartomas of the lung: a case report and review of the literature with special reference to Carney Syndrome. Cancer. 1999; 85:2557-2561.

Disclosure of funding source(s): none

Abstract #223

Single Use or Disposable Flexible Bronchoscopy in Advanced Bronchoscopy Procedures: Experience in a Quaternary Referral Centre.

AM. Sweeney^a (Dr), G. Kavanagh^a (Dr), K. Deasy^a (Dr), H. Danish^a (Dr), M. Kennedy^{*a} (Dr)

^a Cork University Hospital, Cork, IRLANDE

Background

The development of single use flexible or disposable bronchoscopes (SUFBs) has accelerated in recent years, with the reduced risk of infectious transmission and reduced need for endoscopy staffing particularly advantageous in the COVID-19 pandemic era. The object of this study was to assess the performance of a novel single use bronchoscope in an academic quaternary referral centre with on-site interventional pulmonology program.

Methods

With ethical approval in a quaternary referral centre, we prospectively collected data on sequential bronchoscopy procedures using The Surgical Company Broncoflex[®] range of SUFBs. Data collected included demographic, procedural, scope performance, user satisfaction and complication parameters.

Results

139 procedures were performed by five pulmonology faculty from January to July 2021. The majority were carried out for infection (45%) and malignancy (32%). Most were performed in the endoscopy suite and 8% were COVID positive or suspected. Most procedures reported the highest score in satisfaction (83%) with complications related to equipment reported in 15% (predominately related to scope suction or inadequate image quality) reverting to a reusable scope in 3%.

Conclusion

In our subset of patients in a bronchoscopy unit, SUFBs are safe and both routine and advanced bronchoscopy procedures can be performed with high satisfaction reported.

Disclosure of funding source(s):

Dr Kennedy has received speaker fees and equipment for training from The Surgical Company

Abstract #224

Single Use or Disposable Flexible Bronchoscopes: Bench Top and Pre-clinical Comparison of Currently Available Devices

K. Deasy^a (Dr), AM. Sweeney^a (Dr), H. Danish^a (Dr), E. O'Reilly^a (Dr), M. Kennedy^{*a} (Dr)

^a Cork University Hospital, Cork, IRLANDE

Background:

Gathering data regarding the risk of infection related to reusable bronchoscopes, the global drive towards disposable medical technology and the COVID-19 pandemic have lead to an increase in the use and production of single use or disposable bronchoscopes. A comparison of devices has not been published.

Methods:

A bench-top comparison of the Ambu[®]aScope[™] (AM-S) Boston Scientific[®] EXALT[™] Model B (BS-S), The Surgical Company (TSC) Broncoflex[®] Vortex (TSB-S), Pentax[®] Medical ONE Pulmo[™] (PE-S), and Vathin[®] H-Steriscope[™] (VA-S) (all 2.8 mm inner dimension) was undertaken including measurement of maximal flexion and extension angles, thumb force required and suction (using saline and “pseudo-mucus” using a 1% guar gum solution including a standard Pentax 3.2 mm channel scope) with and without biopsy forceps. There-after pre-clinical assessment was performed with data collected including experience, gender, hand size and scope preference.

Results:

The VA-S had the biggest range of tip movement from flexion to extension with and without forceps. The BS-S required the maximal thumb force but had the least reduction of tip movement with forceps. The BS-C significantly outperformed all other scopes including the standard Pentax scope and was the only scope capable of suctioning pseudo-mucus around the forceps. Although there was no significant difference in preference in the overall group, females and those with smaller hand size preferred the PE-S scope and males the TSB-S scope

Conclusions:

Currently available SUFBs differ in a number of factors with the BS-C scope significantly outperforming all other scopes in suction capabilities.

Disclosure of funding source(s):

Dr Kennedy has received speaker fees from Boston Scientific, The Surgical Company and Pentax.

Abstract #225

Single Use or Disposable Flexible Bronchoscopes: Initial Experience with a New Device

E. O'Reilly^a (Dr), AM. Sweeney^a (Dr), M. Kennedy^a (Dr)

^a Cork University Hospital, Cork, IRLANDE

Background

The development of single use flexible or disposable bronchoscopes (SUFBs) has accelerated in recent years, with the reduced risk of infectious transmission and reduced need for endoscopy staffing particularly advantageous in the COVID-19 pandemic era. The object of this study was to assess the performance of a novel single use bronchoscope in an academic quaternary referral centre with on-site interventional pulmonology program.

Methods

With ethical approval in a quaternary referral centre, we prospectively collected data on sequential bronchoscopy procedures using Boston Scientific® EXALT™ Model B scope. Data collected included demographic, procedural, scope performance, user satisfaction and complication parameters.

Results

24 procedures were performed by five pulmonology faculty from January to July 2021, 15 using the larger 2.8 mm channel scope. 5/24 were in patients with malignancy. Two were theatre cases through a rigid bronchoscope. Procedures included endobronchial biopsy, transbronchial biopsy, cryobiopsy, debulking and argon plasma coagulation. There were no scope related complications and no case required conversion to a reusable scope. 24/25 reported the highest score in satisfaction with one procedure where the bronchoscopist was unable to access the right upper lobe with forceps in-situ.

Conclusion

In a small subset of patients in a bronchoscopy unit, the Boston Scientific® EXALT™ Model B scope was safe and both routine and advanced bronchoscopy procedures can be performed with high satisfaction reported.

Disclosure of funding source(s):

Dr Kennedy has received speaker fees from Boston Scientific

Abstract #226

Evaluation of laser tracheobronchoplasty for treatment of tracheobronchomalacia

I. Atallah^a (Dr), P. Castellanos^b (Dr)

^a Grenoble Alpes University Hospital, Otolaryngology-Head and Neck Surgery Department, Grenoble, FRANCE ; ^b Mercy Health – St. Rita's Ear, Nose and Throat, Lima, Oh, ÉTATS-UNIS

Background: Despite different support techniques, the management of tracheobronchomalacia is still a challenging problem. The purpose of our study was to evaluate and to confirm the efficacy of a novel treatment by laser introduced for the first time in 2016 to treat this common disease.

Methods: A consecutive series of patients with a diagnosis of diffuse or segmental tracheobronchomalacia confirmed by transnasal flexible bronchoscopy under local anesthesia that showed excessive dynamic airway collapse during exhalation and or coughing, were treated with two to three holmium laser scarring surgeries of the hyperdynamic tracheal and bronchial walls for the purpose of stiffening them through fibrosis. Patients filled out a Dyspnea Index questionnaire before and after treatment.

Results: Twenty seven patients were treated for their tracheobronchomalacia with a mean age of 51 years. Symptoms included severe dyspnea, dry cough, recurrent pulmonary infections, and respiratory failure. Fifty percent of patients presented with wheezing refractory to traditional treatment. Tracheobronchomalacia was associated with gastroesophageal reflux disease (n=12), obstructive sleep apnea (n=7), and tracheobronchial stenosis (n=6). Only 35 % of patients presented with morbid obesity. All cases showed significant improvement of their respiratory symptoms with a mean postoperative difference of 25 out of a maximum impairment score of 40 (P <0.05) on the Dyspnea Index. The mean number of procedures was 2.1 per patient with the average laser energy delivered per procedure of 1500 joules.

Conclusion: Laser tracheobronchoplasty is a safe, easy to adopt, and effective technique for the treatment of tracheobronchomalacia. It presents a simple alternative to the commonly used procedures like endoluminal stenting and open tracheobronchoplasty.

Reference:

Castellanos P, Mk M, Atallah I. Laser tracheobronchoplasty: a novel technique for the treatment of symptomatic tracheobronchomalacia. *Eur Arch Otorhinolaryngol.* 2017.

Disclosure of funding source(s): none

Abstract #227

Unilateral Wheezing After Pulmonary Tuberculosis

E. Tashi^{*a} (M.), S. Golgota^a (M.), S. Bala^a (Pr)

^a *University Hospital Shefqet Ndroqi, Tirana, ALBANIE*

Background

Infection of tracheobronchial tree, termed endobronchial tuberculosis (EBTB), exists in 10-40% of patients with pulmonary involvement of tuberculosis

Case report

Here we present a case of a 24 year old woman which presented to hospital due to recurrent infections in the chest and wheezing during rest. She has been taking several courses of antibiotics and inhalator pumps but without improvement

Patient one year before has been diagnosed with sputum positive for mycobacterium tuberculosis and treated with 4 drug regimen for 2+4 months. No resistance was noted on culture. Overall treatment went good. Patient became negative at the 4 week of treatment. No reaction was noted. Patient compliant and full therapy was taken.

A bronchoscopy was conducted and Annular stenosis of the entrance of the right upper lobe was noted. The scope could not pass and stenosis was simple. Electrocautery was applied . The symptoms residues completely. 1 year follow up was unremarkable

Conclusion

Patients who are diagnosed with TSTB secondary to previous pTB, with recurrent lower respiratory tract infections, absence of systemic symptoms, or CT findings of fibrosis or lung collapse, may have a higher risk of symptom recurrence on conservative management alone. Stenting ,surgical resection, argon plasma and elctrocautery are options of treatment.

Disclosure of funding source(s): none

Abstract #228

Pleuroscopy with semi-flexible Pleura thoracoscope

E. Barbeta^{*a} (Dr), J. Tarrega^a (Dr), Y. Galea^a (Dr), A. Mola^a (Dr)

^a *Hospital General de Granollers Universitat Internacional de Catalunya, Granollers, ESPAGNE*

Pleuroscopy, also known as thoracoscopy under local anaesthesia is a useful technique in the diagnosis and treatment of pleural effusions. The development of a semi-rigid thoracoscope, similar in design to the flexible bronchoscope, can implement this technique in the departments of pneumology and improve the performance in the management of pleural disease.

AIM: to describe the results of the pleuroscopies performed in a general hospital during the last 12 years, using the OLYMPUS LTF-160 semiflexible thoracoscope. The pleuroscopies were performed under local anaesthesia and conscious sedation in an area of endoscopy.

242 patients (mean age 65 years) underwent pleuroscopy, in 170 cases for diagnosis and 72 for pleurodesis. Were 113 diagnoses of malignancy (78 carcinomatous pleurisy, 28 mesotheliomas, 4 lymphomas, 2 sarcoma and 1 melanoma) 4 patients were false negative (2 mesothelioma and 2 carcinomas). The specificity for malignancy was 100% and sensitivity 96%. In 5 patients with bronchogenic carcinoma and 1 with carcinoma of urinary tract, pleural metastasis was discarded. Were 10 tuberculosis pleurisy, 3 empyema and 38 nonspecific pleuritis. 149 pleurodesis with talc (Steritalc Novatech) were performed, the median survival of 71 deceased patients was 156 days.

Complications of the technique have been: 7 cases of subcutaneous emphysema, 3 case of infection stitch, 6 case of persistent air leak and 1 empyema

1 - The pleuroscopy with semi-flexible thoracoscope is a safe, minimally invasive technique, with high performance diagnostic and therapeutic indications.

2 - The realization of this technique under local anaesthesia and conscious sedation in endoscopy rooms simplifies and speeds up the diagnostic process of diseases of the pleura.

3 - The availability of this semi-rigid thoracoscope should facilitate the implementation of this technique in respiratory endoscopy units and increase the efficiency of pulmonologists in the management of pleural pathology.

Disclosure of funding source(s): none

Abstract #229

The Diagnosis and Treatment of Endobronchial Hamartoma by Cryobiopsy and Therapy via Flexible Bronchoscopy.

A. Teferici^a (Dr), I. Peposhi^a (Dr), O. Nuredini^a (Dr)

^a *University Hospital Shefqet Ndroqi, Tirana, ALBANIE*

A 68 year old male with complaining of dyspnea for nearly two months was admitted to hospital, department of cardiology for chest pain and transudative right pleural effusion, with ACS diagnosis. He underwent Coronary Angiography test with result negative.

The thorax computerized tomography showed, there is an endoluminal with fat density lesion in the IX segment of the right lower lobe bronchus. In the mediastinal space there are no lymph node.

The bronchoscopy examination showed, IX segment of the right lower lobe was obstructed by a round mass. The cryotherapy, endobronchial procedure and tumor cryodebridement was performed. The mass was successfully removed with small amount of bleeding. At bronchoscopic examination 1 month after removal showed good patency without any obstruction.

The histopathology result of removed mass was Lipomatous Hamartoma

Endobronchial hamartomas have low frequency between 1.4% and 13.8% of all pulmonary hamartomas. Most patients with endobronchial hamartomas had at least one of respiratory complaints due to bronchial obstruction such as obstructive pneumonia cough dyspnea. Although surgical resection has been considered the standard of treatment for endobronchial hamartomas there is an increasing case reports using bronchoscopic treatment. Bronchoscopic cryotherapy is recognized as a useful in endobronchial treatment modality in the palliative management for airway obstruction due to malignancy. It is also useful in management for airway obstruction due to a benign endobronchial lesion. The effectiveness of cryotherapy is limited in long segment, submucosal tumor. Our case was suitable for cryotherapy because endobronchial tumor attached the bronchus with stalk. We could easily perform the endobronchial biopsy and removal of endobronchial hamartoma using cryotherapy via flexible bronchoscopy without complication. During and postprocedural period there was no notable complication. Follow up bronchoscopic examination excluded residual or recurrent disease in our case.

In conclusion Cryobiopsy and therapy is safe and less invasive procedure in diagnosis and treatment of endobronchial hamartomas.

Disclosure of funding source(s): none

Abstract #231

A rare complication of an endobronchial ultrasound-guided intranodal forceps biopsy (EBUS-IFB)

M. Oudah^a (Dr), K. Diab^a (Dr)

^a *George Washington University Hospital, Washington, D.C, ÉTATS-UNIS*

Endobronchial ultrasound-guided intranodal forceps biopsy (EBUS-IFB) is a novel technique used simultaneously after a transbronchial needle aspiration (TBNA). The TBNA needle creates a puncture path for the forceps to enter the lymph node for biopsy. The sample collected can provide an improved histological assessment to help diagnosed mediastinal lymphoma and sarcoidosis. We present the first case of a 22-gauge Vizishot™ needle breaking off during sheath dilation for path formation. A 51-year-old man, never-smoker, with generalized weakness and a 30-pound unintentional weight loss presented with hypercalcemia at 13.4 mg/dL. A positron emission tomography (PET) scan confirmed extensive mediastinal and hilar adenopathy with increased uptake up to 7.9 max SUV. Due to suspicion of sarcoidosis or malignancy, he underwent EBUS with TBNA and IFB. TBNA was performed in stations 7 and 11L. Station 11L had the largest diameter and therefore was chosen for IFB. IFB puncture track was initially created using a 22-gauge Vizishot™ needle. However, the needle tip was fractured in the lymph node during the fifth dilation pass and not visualized on the bronchial wall. The fractured needle underwent unsuccessful retrieval attempts using 2 mm forceps through the dilated tract. A new path was created with another 22-gauge Vizishot™ needle sheath, and the 2 mm forceps advanced smoothly with a successful needle grip and removal. EBUS inspection showed complete removal of the needle. There were no post-procedure complications. Biopsy results showed non-necrotizing granulomas and were negative for infection or malignancy. He was diagnosed with pulmonary sarcoidosis. Most EBUS-IFB procedures were found successful using 19, 21, and 22-gauge needles with sheath dilation. Our case shows a potential complication of needle fracture related to sheath dilation. Further studies are needed to assess the efficacy and safety of various end-bronchial needles for IFB procedures.

Disclosure of funding source(s): none

Abstract #232

Dose-effect relationship of photodynamic therapy on human non-small cell lung cancer in vivo

W. Sun^a (Dr), XY. Ma^a (Dr), GF. Wang^{*a} (Dr)

^a Peking University First Hospital, Beijing, CHINE

Background: Although photodynamic therapy (PDT) has gained increasing attention in treating lung cancer worldwide, current light dosimetry remains unclear that may affect the clinical efficacy. This study aimed to determine the optimal light dose on PDT by comprehensively evaluating macroscopic factors and microscopic apoptosis.

Methods: A model of subcutaneously implanted tumors using a lung adenocarcinoma cell line A549 in Balb/c nude mice has been established. The mice were injected with hematoporphyrin derivatives (3mg/kg) and irradiated superficially using 630 nm laser light 48 hours later at doses of 100, 200, 300, 400, and 500 J/cm². The relative tumor volume (RTV), the tumor growth inhibition rate (TGI%) and complete remission (CR) rates were calculated. The assessment of apoptosis was performed after 4 weeks treatment.

Results: Compared to the untreated group, there was no difference in the RTV of 100 J/cm² group, while the RTV of the other treatment groups (200, 300, 400, and 500 J/cm²) was significantly lower. In the 100 J/cm² group, there were significant differences whether in the CR rates (0%) or the percentage of TGI% $\geq 75\%$ (20%) compared with the other treatment groups (CR 56%-70%; TGI% 70%-90%), especially the 300 and 400 J/cm² groups (CR 70%; TGI% 90%). In 300 and 400 J/cm² groups, the expression of Caspase-3, PARP1, and Bax was increased significantly, and the Bcl-2 expression was significantly lower. Investigation of apoptotic mechanisms indicated that light dose could cause pathway activation differently by varying degrees of regulation of related molecules.

Conclusions: These results pinpoint the optimal dose on PDT of 300 and 400 J/cm² showing considerable therapeutic potential for lung cancer, highlighting the light dose as a crucial factor in antitumor efficacy, which may have critical guiding implications for the clinical application.

Disclosure of funding source(s): none

Abstract #233

Neither “hot” nor “cold” -Establishing the role of the micro-debrider in central airway tumours

S. Krishnan^a (Dr), A. Satpati^a (Dr), B. Biswas^a (Dr), S. Bhattacharyya^a (Dr), A. Bhattacharyya^a (Dr), R. Dhar^a (Dr)

^a Calcutta Medical Research Institute & Hospital, Kolkata, INDE

Background:

The microdebrider, first introduced over 15 years ago, has been sparsely used by interventional pulmonologists in debulking central airway tumors. Its utilization has been mainly by Otolaryngologists in resecting glottic and subglottic lesions. We did this study to establish the safety and efficacy of the microdebrider in debulking central airway tumors more effectively compared to existing modalities.

Methods:

6 consecutive patients with central airway tumours, from March 2021 to April 2022, underwent resection using the microdebrider under general anaesthesia. A 12 mm Rigid Bronchoscope was used for bronchial tumours while a 14 mm Rigid Tracheoscope was used for the tracheal tumours. The 45cm long Bronchial blade microdebrider was used for debulking. Our protocol involved taking a conventional biopsy pre-debridement.

Results:

Of the 6 patients, 3 had left main bronchial tumours, 2 had right main bronchial tumours, and 1 tracheal tumour. Of these, 2 bronchial tumours were diagnosed as squamous cell cancer, 2 neuroendocrine tumours, 1 small cell cancer and 1 tracheal amyloidosis. Obstructing lesions were rapidly removed in all patients with the microdebrider and the interventions lasted between 4 and 15 minutes. 3 of the bronchial tumours were very vascular but the bleed was controlled in a short time with fogarty balloon tamponade. There were no other procedure-related complications. As 3 patients with bronchial tumours had malacic airways post debulking, covered metallic bronchial stents were placed. There was no mortality and no patients required a repeat procedure for airway obstruction in the 6 month follow up period.

Conclusion:

The advantage of the microdebrider includes rapid, precise tumour debulking (especially broad based tumours) with simultaneous suctioning of the bleed thereby maintaining vision. It avoids airway fires, as might happen with hot techniques. We need to be cautious of airway wall damage in this procedure.

Disclosure of funding source(s): none

Abstract #234

Miniature cryoprobe vs Endobronchial forceps for diagnosis of Endobronchial Pathologies - Prospective Observational Study

HK. Gonuguntla^{*a} (Dr), PVS. Belgundi^a (Dr)

^a *YASHODA HOSPITALS, Hyderabad, INDE*

A wide variety of diseases involve tracheobronchial tree ranging from benign conditions like sarcoidosis, tuberculosis, amyloidosis, endobronchial lipoma to malignant conditions like lung cancer, neuro endocrine tumours. Conventional techniques to obtain tissue samples in endobronchial pathologies include brush cytology, forceps biopsy and conventional cryoprobes (2.4 mm/1.9 mm). conventional cryo probes have shown superior diagnostic yield compared to endobronchial forceps for endobronchial malignancies.

In this prospective observational study, we aim to compare the diagnostic yield of a novel flexible miniature cryo probe (ERBE 1.1 mm, 20402-401) with conventional endobronchial forceps biopsy (FB-233D) for endobronchial pathologies (benign and malignant). Study results will be discussed during conference.

Disclosure of funding source(s): none

Abstract #235

Clinical impact of isolated mediastinal and hilar lymphadenopathy (IMHL). Insights from thoracic endosonography (EBUS/EUS-b).

A. Papaporfyriou^a (Dr), T. Karampitsakos^b (M.), S. Koukidou^a (Mlle), M. Anyfanti^c (Mme), E. Zervas^a (M.), G. Hillas^a (Dr), A. Tzouvelekis^b (Pr), K. Dimakou^a (Dr), S. Chrysikos^a (Dr)

^a Sotiria Athens Chest Diseases Hospital, Athens, GRÈCE ; ^b Department of Respiratory Medicine, University Hospital of Patras, Greece, Patras, GRÈCE ; ^c ICU, G Gennimatas, General Hospital, Athens, Greece, Athens, GRÈCE

Background: Patients with IMHL are always a challenge for the clinician. Often an invasive procedure is required to obtain tissue for cytopathological and microbiologic assessment.

Aim: To evaluate the performance of EBUS/EUS-b for diagnosing IMHL.

Methods: We conducted a prospective study in "Sotiria" Athens chest hospital from September 2016 to September 2021. Patients with IMHL on chest computed tomography underwent EBUS/EUS-b as the first evaluation. Patients with known or suspected primary lung cancer were excluded. Final diagnosis was made using cytopathology or microbiology reports.

Results: Overall, 140 patients with IMHL underwent EBUS/EUS-b [mean age 57.1 years (SD = 14.3), men 83, smokers 61.4%]. EUS-b alone or in combination with EBUS was performed in 10.7%. In total, 270 lymph nodes were sampled (264 through EBUS/ 15 through EUS-b). Diagnostic yield of EBUS/EUS-b was 65%. Most cases (n = 59, 42.1%) involved benign disease (88.1% sarcoidosis/10.2% tuberculosis), 22.9% malignant disease (62.6% primary lung cancer, 21.9% metastatic, and 12.5% lymphoma), while 35 % (n=49) of patients remained undiagnosed. Mediastinoscopy was performed in 18.4% of patients with non-diagnostic EBUS, while the rest (79.6%) remained in clinical and radiological follow up for at least six months. Diagnosis was achieved in 21% of patients with negative EBUS [sarcoidosis (n=4), lymphoma (n=1), primary lung cancer (n=2), other (n=2)]. Reactive lymphadenopathy was identified in 28.5%. Sensitivity, specificity, positive and negative predictive value of EBUS/EUS-b in total was 91%, 100%, 100%, and 81.6%, respectively. For sarcoidosis, the sensitivity was 93%.

Conclusion: In patients with IMHL, EBUS/EUS-b is a reliable and effective first-line diagnostic technique.

Disclosure of funding source(s): none

Abstract #236

Surgical drain repurposed as an indwelling pleural catheter

MS. Gopala Krishna*^a (Dr)

^a *Aayush Hospital, Vijayawada, INDE*

Aim

A proof of concept to demonstrate the closed wound surgical drain can be used as an alternative to indwelling pleural catheter for management of recurrent pleural effusions in resource constrained setting

Background

Despite the obvious advantages, the prohibitive cost of IPC's and availability have limited their widespread adoption in developing countries. A closed wound surgical drain is economical and widely available and can be tunneled subcutaneously like the IPC's to achieve comparable outcomes.

Methods

IPC's insertions are considered standard of care in management of recurrent pleural effusions. This is largely because they are reported in literature to reduce incidence of pleural infections and can be self-managed by the patient. Small bore (size 14 and 16F) surgical drains were prospectively inserted in patients who presented with recurrent pleural effusions. The closed wound surgical drain was tunneled subcutaneously like IPC's and patients were taught to self-manage the same

Results

52 patients with recurrent pleural effusions of varying aetiologies were prospectively included into the study. 34 had Malignant Pleural Effusion, 14 with hepatic hydrothorax, 3 had chronic tubercular pleural effusions and one had Chylothorax. The mean duration of the catheter in situ was for 46 days (8 to 281 days). Auto-pleurodesis was achieved in 28 patients and the catheter was removed. Mild Pain was the most common complication reported in 41 patients. In 11 subjects the tube was clogged with debris however in only 2 patients this warranted reinsertion of new drain. Catheter site infection rate was 3.8% comparable to that seen in IPC's.

Conclusion

The closed wound surgical drain is economical, effective and well tolerated and can be used in lieu of IPCs in resource constrained settings

Disclosure of funding source(s): none

Abstract #237

Diagnostic yield of linear and radial endobronchial ultrasound in 558 patients of Fundacion Neumologica Colombiana and effect of rapid on-site cytological evaluation (ROSE)

L. Giraldo-Cadavid^{*a} (Dr), N. Paez^b (Dr), J. Mugnier^c (Dr), L. Viola^d (Dr), L. Jimenez-Maldonado^d (Dr), M. Suarez^d (Dr), M. Duran^d (Dr), H. Herrera^c (Dr), J. Flandes^e (Dr)

^a Fundación Neumológica Colombiana; Universidad de La Sabana, Bogotá, COLOMBIE ; ^b Fundación Neumológica Colombiana, Bogotá, COLOMBIE ; ^c La Cardio, Bogota, COLOMBIE ; ^d Fundacion Neumologica Colombiana, Bogota, COLOMBIE ; ^e Fundacion Jimenez-Diaz, Madrid, Madrid, ESPAGNE

The implementation of EBUS in Latin America entails challenges related to staff training, equipment acquisition and paperwork for the approval of the procedures by insurers that could decrease its diagnostic performance, compared to that reported by reference centers in developed countries (90% for Linear EBUS and 70% for Radial EBUS). Our objective was to evaluate the diagnostic performance of Linear and Radial EBUS in the Fundacion Neumologica Colombiana and determine the effect of the Rapid On-site Cytological Evaluation (ROSE) on Radial EBUS.

Patients referred for radial or linear EBUS were recruited consecutively. The EBUS was performed under deep sedation with a laryngeal mask by two interventional pulmonologists. Qualitative variables were described with absolute and relative frequencies, quantitative variables with means and standard deviation or median and interquartile ranges depending on whether they had normal distribution or not. The association between qualitative variables was explored using the exact Mid-p test, for the quantitative variables the Student's t-test or the Mann-Whitney U test was used depending on whether they had a normal distribution or not.

Of a total of 558 EBUS included, 65% were Linear and 35% Radial. Patients undergoing linear and radial EBUS in the same anesthetic procedure were 51. The diagnostic yield of linear EBUS was 87% and of radial EBUS was 81%. The most frequent diagnosis was cancer in 54% of the patients and 31% had benign pathologies. ROSE was performed in 51 cases, which improved the diagnostic performance of Radial EBUS from 71% to 88% (P=0.05).

The diagnostic performance of lineal and radial EBUS was good and like that reported in the literature in reference centers in developed countries. The implementation of ROSE allowed increasing the diagnostic performance of the radial EBUS to the same values as the linear EBUS and higher than that reported in the literature.

Disclosure of funding source(s): none

Abstract #238

Balloon dilatation for tracheal stenosis after prolonged intubation

C. Febriandri^a (M.), GA. Desianti^a (Mme), MF. Alatas^a (M.), E. Efriadi^a (M.)

^a Universitas Indonesia - Persahabatan Hospital, Jakarta, *INDONÉSIE*

Background: tracheal stenosis following prolonged intubation is a relatively rare but serious problem. There are various treatment modalities that can be performed as a single procedure and/or combined. Although balloon dilatation is effective and relatively easy to perform, still there were not many cases reporting successful treatment of balloon dilatation as single procedure in tracheal stenosis.

Case: we report a 43-year-old-man who presented dyspnea for two months. He previously was in ventilation assisted post-road traffic accident (RTA) for 7 days due to brain injury. He came to emergency room with stridor and need of oxygen supplement. A chest computed tomography scan showed pathological narrowing of trachea. Flexible bronchoscopy using therapeutic scope no. 5,8 revealed proximal tracheal stenosis with diameter 0.5 cm, length of stenosis 4 cm with 1.5 cm from vocal cord. The balloon dilatation using balloon number 12 then performed and the diameter of trachea increased 1.5 cm and symptoms relieved.

Conclusion: Tracheal balloon dilatation is initiated to enlarged the diameter of the airway. Multiple factors are responsible for stenosis caused by prolonged intubation. Tracheal stenosis occurs after intubation 7-19 days. The mechanism of balloon dilatation is to create some cracks at the stenotic site to expand the tracheal wall. Balloon dilatation is an easy and effective way to relieve tracheal stenosis and can be repeated safely several times. If the tracheal cartilages are not damaged, a good outcome can be achieved by single dilatation session. Excessive balloon inflation may cause rupture of the airway leading to hemorrhage, pneumothorax, pneumomediastinum, or mediastinitis.

Keyword: tracheal stenosis, balloon dilatation

Disclosure of funding source(s): none

Abstract #239

A lymph node mediastinal foreign body reaction mimicking nodal metastasis: a case series

F. Gonnelli^a (Dr), MA. Latini^a (Dr), L. Zuccatosta^a (Dr), E. Barisione^b (Dr), M. Salio^c (Dr), S. Gasparini^d (Pr)

^a Pulmonary Diseases Unit, Azienda Ospedali Riuniti, Ancona, Italy, Ancona, ITALIE ; ^b Pulmonary Diseases Unit, Ospedale San Martino, Genova, Italy, Genova, ITALIE ; ^c Pulmonary Diseases Unit, Ospedale Ss. Antonio e Biagio e Cesare Arrigo, Alessandria, Italy, Alessandria, ITALIE ; ^d Polytechnic University of Marche Region, Ancona, Italy, Ancona, ITALIE

Introduction: The role of EBUS-TBNA in diagnosis of hilar and mediastinal lymphadenopathies is well established and it represents an excellent tool in diagnosis and staging of lung cancer.

International Guidelines suggest EBUS-TBNA as the first step in ruling out lymph node metastasis in patients with lung cancer and hilar and/or mediastinal lymph node enlargement on CT scan and/or fluoro-dessossi-glucose positrone emission tomography (FDG-PET) positive lymphadenopathies.

Case series: Six patients were referred to “Ospedali Riuniti di Ancona” (n=5) and “Ospedale San Martino” (Genova) (n=1) Interventional Pulmonology Units for the characterisation of hilar and/or mediastinal lymphadenopathies detected by CT scans, which were also intensely PET-positive (mean SUVmax=7.3).

All the evaluated patients underwent surgical procedures for lung cancers within the previous six months. EBUS-TBNA was performed in all the patients to rule out nodal metastasis. Sampled lymph nodes were: right inferior paratracheal (4R) (n=5), subcarinal (7) (n=3), left inferior paratracheal (4L) (n=1), and right hilar (11R) (n=1).

The cyto-pathological evaluation did not reveal atypical cells, rather showing amorphous acellular eosinophilic material surrounded by an inflammatory reaction. The acellular component resulted to be part of the oxidized regenerated cellulose product (“*TabotampO*, Ethicon SARL, Switzerland”) used to obtain bleeding control during the previous chest surgery.

Conclusion: In the last decades, many haemostatic substances included oxidized cellulose topically applied have been used during surgery and their use have become a common practice.

In patients who underwent surgery for lung cancer, especially within few months, the development of lymph node foreign body reaction due to surgical material retention should always be considered. This case report reiterates the need to obtain cyto-histological confirmation of PET-FDG positive lymph nodes in cancer patients and further underlines the essential role of EBUS-TBNA in the diagnostic work-up and follow-up of lung cancer.

Disclosure of funding source(s): none

Abstract #240

Diagnostic accuracy of endobronchial ultrasound needle aspiration with and without suction: preliminary results of a single-center randomized controlled trial

F. Gonnelli^a (Dr), L. Zuccatosta^a (Dr), S. Gasparini^b (Pr)

^a Pulmonary Diseases Unit, Azienda Ospedali Riuniti, Ancona, Italy, Ancona, ITALIE ; ^b Polytechnic University of Marche Region, Ancona, Italy, Ancona, ITALIE

Introduction: The role of ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) for the diagnosis of hilar/mediastinal lymphadenopathies is well-established. However, different aspiration techniques are available and it is not clear if there is a significant difference between suction vs no-suction aspiration. Of great interest is the role of different aspiration techniques in EBUS-TBNA in determining the diagnostic accuracy for histopathological evaluation, including molecular biology and PD-L1 amplification assessment in lung cancer diagnosis.

In this context, no comparative studies have been performed; moreover, considering only suction techniques, data exploring the difference between ex-vacuum aspiration and manual aspiration are still lacking.

Methods: Eligible patients were randomized 1:1:1 to either the no-suction aspiration (NS) or ex-vacuum aspiration with EBUS-TBNA dedicated syringe (EV) or manual applied aspiration (MA). The primary endpoint was to test the non-inferiority of NS over the other techniques in terms of diagnostic yield. The secondary endpoint was to assess the adequacy for molecular study in lung cancer.

Results: A total of 120 patients were randomized to either NS ($n = 47$) or EV ($n = 37$) or MA ($n = 36$). The diagnostic yield of the techniques was not statistically different (NS: 95%, EV: 97%, MA: 94% $p > 0.05$). The sample resulted suitable for molecular assessment in 93% of NS group, in 82% of EV group and 96% of MA group ($p > 0.05$).

Conclusions: All the available aspiration techniques resulted to be excellent as diagnostic tool of hilar/mediastinal lymphadenopathies, all providing a high diagnostic yield, obtaining histological samples of high quality, even suitable for pathological molecular assessment in lung cancer (i.e. PD-L1 expression). However, these preliminary data suggest that EV provides a lower diagnostic accuracy for molecular analysis, result that needs to be confirmed at the end of the trial reaching an adequate size sample.

Disclosure of funding source(s): none

Abstract #241

Spontaneous healing of fistula formed after EBUS-TBNA in monomorphic epitheliotropic T-cell lymphoma

WK. Ryu^a (Dr), JS. Kim^b (Pr), J. Park^c (Pr), SH. Yong^{*a} (Pr)

^a Division of Pulmonology and Critical Care, Department of Internal Medicine, Severance Hospital, Yonsei University College of Medicine, Seoul, CORÉE, RÉPUBLIQUE DE ; ^b Division of Hematology, Department of Internal Medicine, Severance Hospital, Yonsei University College of Medicine, Seoul, CORÉE, RÉPUBLIQUE DE ; ^c Division of Gastroenterology, Department of Internal Medicine, Severance Hospital, Yonsei University College of Medicine, Seoul, CORÉE, RÉPUBLIQUE DE

Background

Tracheal or bronchial fistulas after endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) are rarely reported as a procedure-related complication, but are sometimes fatal. There were few reports of spontaneous closure of fistulas formed after EBUS-TBNA. Here, we report a case of spontaneous healing of fistula formed after EBUS-TBNA in a patient with monomorphic epitheliotropic T-cell lymphoma.

Case report

A 72-year-old man was referred to a pulmonologist for evaluation of mediastinal lymphadenopathy. He was a current smoker and had a history of cerebral infarction, prostate cancer treated with radical prostatectomy. He was admitted, underwent EBUS-TBNA of the subcarinal lymph node, and was discharged without complications.

Two weeks after discharge, he developed a severe cough and foul-smelling sputum. Chest computed tomography (CT) revealed a fistula from the main carina to the subcarinal lymph node. However, the pathological result of EBUS-TBNA showed non-specific inflamed tissue. Another clue to the underlying condition was that the patient had hematochezia. Upper and lower gastrointestinal endoscopies were performed, and there were several shallow oval ulcers in the sigmoid colon. Ulcer biopsy revealed chronic active inflammation with granulation tissue and dense lymphocyte infiltration, involvement of intestinal T-cell lymphoma, most likely monomorphic epitheliotropic T-cell lymphoma (METL). Considering all diagnostic tests and clinical course, the subcarinal lymph node was assumed to be metastasis of METL.

He received CHOP chemotherapy and considered inserting a rigid silicone stent to close the fistula, but he refused. On follow-up CT after 3 months, the previous subcarinal fistula healed spontaneously. He is scheduled to receive the next chemotherapy and is planning a bronchoscopy after his condition improves.

Conclusion

Fistula formation after EBUS-TBNA is a rare complication. However, diseases with severe inflammatory characteristics can more easily cause fistula formation. Also, fistula may heal spontaneously if disease activity is controlled.

Disclosure of funding source(s): none

Abstract #242

Pneumatocele in a COVID-19 patient treated with endobronchial valves - A case report

AS. Bugge^{*a} (Dr), A. Sundset^a (Dr), TM. Aaløkken^a (Dr), LH. Jørgensen^a (Dr)

^a *Oslo Univeristy Hospital, Oslo, NORVÈGE*

Background

In the course of COVID-19 pneumonia, spontaneous pneumomediastinum, pneumothorax, and pneumatocele have been reported as rare complications. It is assumed that positive pressure ventilation is the most important contributing factor to the pneumatocele formation. Additionally, lung injury caused by pneumonia and inflammation may lead to destruction of lung parenchyma.

Case report

A Caucasian man in his 40's was admitted to his local hospital six days after the first unspecific symptoms of COVID-19. His general condition deteriorated and he was treated in the intensive care unit, but did at no point require mechanical ventilation. During his recovery, he experienced a cough bout, after which his dyspnea worsened. CT pulmonary angiogram showed a 10 x 18 cm and gradually expanding cavitory lesion with an air-fluid level and surrounding atelectasis of the right lower lobe. The patient was treated by occlusion of all bronchial segments of the right lower lobe with endobronchial valves (EBV) (Zephyr®, Pulmonx Inc.). The pneumatocele was subsequently completely evacuated with a CT-guided insertion of a pigtail drainage, which was removed after six hours. The patient's condition improved rapidly, and he was discharged one week later. On control scheduled 4 weeks after valve insertion, no pneumatocele could be identified on CT, and the valves were removed during flexible bronchoscopy. The lung function almost normalized and the patient returned to work 6 months after treatment.

Conclusion

Most pneumatoceles do not require specific treatment and disappear spontaneously. In this case, the large volume of a gradually expanding pneumatocele caused significant reduction in lung function and a clinical deterioration. Insertion of EBV in the affected lobe and subsequent decompression by CT-guided drainage was efficient, and clinical improvement was rapid as the pneumatocele disappeared. The EBV were removed 4 weeks later, and the lung function almost normalized.

Disclosure of funding source(s): none

Abstract #243

The Diagnostic Performance of Shape Sensing Robotic-Assisted Bronchoscopy versus Digital Tomosynthesis-Corrected Electromagnetic Navigation Bronchoscopy: A Comparative Cohort Study

SW. Low^{*a} (Dr), R. Lentz^a (Dr), H. Chen^b (Mlle), J. Katsis^c (Dr), M. Aboudara^d (Dr), O. Rickman^a (Dr), F. Maldonado^a (Pr)

^a Division of Allergy, Pulmonary and Critical Care Medicine, Vanderbilt University Medical Center, Nashville, ÉTATS-UNIS ;

^b Department of Biostatistics, Vanderbilt University Medical Center, Nashville, TN, USA, Nashville, ÉTATS-UNIS ;

^c Department of Internal Medicine, Division of Pulmonary and Critical Care, Rush University, Chicago, ÉTATS-UNIS ;

^d Division of Pulmonary and Critical Care, St. Luke's Health System, University of Missouri-Kansas City, Kansas City, ÉTATS-UNIS

Background

The increasing incidence of indeterminate pulmonary nodules detected incidentally or via lung cancer screening highlights the need for safe and accurate biopsy modalities. Electromagnetic navigational bronchoscopy (ENB) has been the dominant bronchoscopic modality and now includes digital tomosynthesis (DT-ENB) for intra-procedure correction of computed tomography scan (CT)-body divergence. More recently, shape-sensing robotic-assisted bronchoscopy (ssRAB), with improved catheter stability and articulation but lacking DT, has become available. We sought to compare the diagnostic yield of ssRAB to DT-ENB during the first 6 months each modality was utilized at our institution.

Methods

Demographic, radiographic, and procedural data are prospectively collected on all navigational bronchoscopies at Vanderbilt University Medical Center. DT-ENB was introduced in April 2018 and ssRAB in November 2021; consecutive procedures performed six months after each introduction were identified in this database. Biopsies were considered diagnostic if histopathology revealed malignancy or specific benign features that readily explained a nodule's presence (e.g., granulomatous inflammation, robust neutrophilic inflammation/purulence, and organizing pneumonia).

Results

ssRAB was used to biopsy 137 nodules in 127 patients, and DT-ENB was used in 197 nodules in 173 patients six months after each modality was introduced. There were no baseline differences between groups. Diagnostic yield was 77% for ssRAB (110/143) and 80% (158/197) for DT-ENB ($p = 0.46$). Median nodule diameters were 17 and 19 mm, respectively. There was no difference in yield after adjustment for nodule size, bronchus sign, and peripheral vs. middle third location. A diagnostic biopsy was more likely with larger nodule size, concentric radial ultrasound view, and solid nodule density. Pneumothorax complicated 1.5% of ssRAB and 1.7% of DT-ENB procedures.

Conclusion

The diagnostic yields of ssRAB and DT-ENB were similar in this comparative cohort study with similar patient and nodule features using a conservative diagnostic yield definition. These results should be confirmed by randomized trials.

Disclosure of funding source(s):

F.M. reports consulting fees and research support from Medtronic.
O.R. reports consulting fees from Medtronic.

For the remaining authors there is no conflict of interest or other disclosures.

Abstract #244

Pleural Aspergillosis

P. Prasenohadi^{*,a} (Dr)

^a Department of Pulmonology and Respiratory Medicine. Faculty of Medicine, Universitas Indonesia, Persahabatan Hospital., Jakarta, INDONÉSIE

Background

Pleural aspergillosis is an uncommon disease; only 25 cases have been reported in the literature. Pleural Aspergillosis is a rare entity, with most of the cases occurring on a background of lung disease or surgery. The pleura is infected by aspergillus through bronchopleural or pleurocutaneous communication.

Aspergillus may cause a broad spectrum of disease in the human host, ranging from hypersensitivity reactions to direct angioinvasion. *Aspergillus* primarily affects the lungs, causing four main syndromes, including allergic bronchopulmonary aspergillosis (ABP A), chronic necrotizing *Aspergillus* pneumonia, aspergilloma, and invasive aspergillosis.

Case Reports

We report a case of a 26-year-old male who developed pleural Aspergillosis in the absence of any obvious predisposing factors. Patient presented with fever, dry cough and left sided chest discomfort of 6 weeks duration. A chest radiograph revealed features of the right pyopneumothorax. A chest CT scan showed a bronchiectasis, atelectasis, and right pyopneumothorax. Bronchoscopic showed partial compression of right upper lung, middle lobe and right lower lobe. Pleuroscopy showed wide fibrosis tissue in pars diaphragmatic, apex. visceral pleural. The pleural biopsy resulted an *aspergillosis*.

Conclusion

Pleural aspergillosis is a rare disease and to diagnosis of pleural aspergillosis we must performed medical thoracoscopy.

Key words: aspergillosis, pleuroscopy

Disclosure of funding source(s): none

Abstract #245

Bronchopleural fistula caused by lung abscess was blocked by bronchoscopy with autogenous blood and hyperglycemia

P. Yan^{*a} (Pr), X. Lixin^b (Pr)

^a *China Aerospace Science & Industry Corporation 731 hospital, Beijing, CHINE* ; ^b *College of Pulmonary and Critical Care Medicine, Chinese PLA General Hospital,, Beijing, CHINE*

Objectives: To discuss the treatment of alveolar pleural fistula by bronchoscopic intervention.

Methods: A 70-year-old male individual with lung abscess, septic shock, sequelae of cerebral infarction admitted to China Aerospace Science & Industry Corporation 731 hospital. A large amount of pus was drained after chest closed drainage tube was given, and shock was controlled after active anti-infection. Fluid pneumothorax was found in lung CT scan, and alveolar pleural fistula was considered not to be excluded. After intraperitoneal injection of methylene blue, blue fluid was coughed up from the bronchus, confirming the presence of an alveolar pleural fistula. Thoracic surgery consultation, considering that the patient was septic shock and unable to undergo surgery, suggested conservation treatment. One month later, the patient's alveolar pleural fistula did not improve. After a thorough multidisciplinary discussion, the decision was made to administer bronchoscopic intervention. Autologous blood occlusion was performed under bronchoscopy and hyperglycemia was injected into the thorax. On the second day, there was no gas extraction in the chest closed drainage tube. One week later, pulmonary CT showed atelectasis of the left upper lung and closed alveolar pleural fistula. Two weeks later, the thrombus in the posterior segment of the upper lobe of the left lung was removed by bronchoscopy, and no gas appeared in the closed thoracic drainage bottle. Over the next month, gradually remove the chest drain. Two months later, lung CT showed that the left upper lung returned to normal.

Results: Pulmonary segmental occlusion with autogenous blood and intrathoracic hyperglucose injection is an interventional method in the treatment of alveolar pleural fistula, which can avoid surgical operation due to nonhealing of alveolar pleural fistula. **Conclusion:** Bronchoscopic airway interventional surgery for alveolar pleural fistula is a feasible method, which is less invasive than surgical thoracotomy and can be promoted.

Disclosure of funding source(s): none

Abstract #246

Pyopneumothorax as a presentation of spontaneous esophagopleural fistula due to esophageal cancer: a case report

MM. Inayati^{*a} (Mme), W. Aniwidyaningsih^a (Dr), M. Elhidsi^a (Dr), H. Hidajat^b (Dr)

^a Universitas Indonesia - Persahabatan Hospital, Jakarta, INDONÉSIE ; ^b Persahabatan Hospital, Jakarta, INDONÉSIE

Background: Esophagopleural fistula (EPF) is a rare medical condition that can be caused by malignancy, trauma, or complication postpneumonectomy. It is associated with high morbidity and high mortality due to empyema and nutritional deficiency. In patients with esophageal cancer, the incidence of EPF formation is 4,9%. Bronchoscopy, pleuroscopy, and esophagoscopy are essential to establish the diagnosis of EPF.

Case report: We present a case of a 47-years-old male patient with sudden onset of breathlessness and dysphagia following an open cholecystectomy procedure, without history of trauma. His chest radiograph and CT-scan showed right hydropneumothorax with esophageal dilation, and the pleural fluid production was exudative, consistent with empyema. However, the fluid consisted of food debris, hence our suspicion of EPF. Bronchoscopy showed compression to the right intermediate bronchus. Pleuroscopy showed chronic thickening of the right parietal pleura, confirmed by histopathology as a chronic granulomatous inflammation. Esophagoscopy confirmed a tumor along the patient's esophageal wall, a non-keratinized squamous cell carcinoma that could easily rupture and cause a fistula to the pleural cavity. The patient's comorbidities include tuberculosis, severe sepsis, and malnutrition, causing his condition to worsen in a month after being admitted to the hospital.

Conclusion: The formation of EPF is an uncommon condition and it has no specific clinical condition. If the pleural fluid is suspected to have generated from the digestive system, we should perform comprehensive diagnostic steps, starting with chest CT-scan and esophagogram to diagnostic procedures such as bronchoscopy, pleuroscopy, and esophagoscopy. The definitive therapy should be surgery, but in some cases, the patient's condition could worsen due to secondary infection or severe malnutrition.

Disclosure of funding source(s): none

Abstract #247

Bronchoscopic management of tracheal obstruction due to thyroid cancer: case series

BA. Arnur^a (Mme), M. Elhidsi^a (Dr), SL. Andarini^a (Dr), D. Soehardiman^a (Dr), R. Beginta^b (Dr)

^a Universitas Indonesia - Persahabatan Hospital, Jakarta, INDONÉSIE ; ^b Persahabatan Hospital, Jakarta, INDONÉSIE

Background: Papillary thyroid carcinoma (PTC) is usually associated with favorable survival. Tracheal invasion is a poor prognostic factor due to central airway obstruction (CAO). The incidence of tracheal invasion secondary to thyroid carcinoma is 35-60%. We performed a bronchoscopy on two male patients with CAO who presented stridor due to PTC.

Case report: Case 1, a 50-years-old male patient with PTC. Bronchoscopy showed mass above the vocal cords and completely covers the proximal trachea to mid-trachea. The mass was removed by a laser, cryoablation, and argon-plasma coagulation through the rigid bronchoscope. The next procedure was thyroidectomy. Following thyroidectomy, there was stridor again. We performed an emergency bronchoscopy that showed an infiltrative mass near the carina. It was removed by laser and cryoablation followed by a Y stent implanted. Bronchoscopy evaluation six months later showed compression stenosis of the vocal cord and infiltrative granulation mass partially covering the distal stent. Triamcinolone was injected into the granulation mass, followed by Y stent removal and tracheostomy. Case 2, a 46-years-old male patient with PTC. We did an emergency tracheostomy followed by bronchoscopy with a fiber optic bronchoscope which showed an infiltrative subglottic mass that was almost completely closed the upper airway. This patient was scheduled for thyroidectomy, tracheostomy decannulation followed by cryoablation bronchoscopy.

Conclusion: bronchoscopy is the treatment of choice for CAO due to PTC. Rigid bronchoscope and fiber optic bronchoscope, laser, cryoablation, argon-plasma coagulation, and airway stent are modalities in bronchoscopy that can be performed based on patient performance status and type of obstruction.

Disclosure of funding source(s): none

Abstract #248

Giant endobronchial carcinoid tumor resected by cryosurgery and rigid bronchoscopy

JM. Laca Forero^a (Dr), PF. Garcia Mantilla^a (Dr), F. Monge Espinoza^a (Dr), AE. Coz Roncagliolo^a (Dr)

^a *Inter Neumo, Lima, PÉROU*

Background

Lung Carcinoid tumors are neuroendocrine tumors that mainly have central distribution in the airway as endobronchial masses. Bronchial carcinoids typically produce airway obstruction with lung collapse. Surgical resection is the preferred treatment in their localized stages but endobronchial treatment via Bronchoscopy may be appropriate for patients with small carcinoids limited to the airway, tumors considered unresectable, or when the patient refuses surgery.

Case Report

A 59-year-old man developed complete atelectasis of the left lung due to an endobronchial tumor in the left main bronchus (LMB). He presented with mild dyspnea on exertion and had a good performance status. Tomography shows complete left lung collapse, enhancing soft-tissue tumor in the distal zone of the LMB of 3.6 cm × 3.4 cm. Bronchoscopy found a large, vascularized, broad based, exophytic tumor causing complete occlusion of distal LMB. Histological analysis showed typical bronchial carcinoid. The tumor was considered unresectable due to abnormal lung function tests. Endobronchial Cryosurgery and Rigid Bronchoscopy under general anesthesia was then performed and cryorecanalization was achieved using a cryosurgery unit with a 2.4 mm cryoprobe. Rigid forceps and rigid bronchial barrels were also used for complementary mechanical debulking. After the procedure patient reported better exercise tolerance and a follow-up chest x-ray showed a significantly ventilated left lung.

Conclusions

Cryosurgery for endobronchial resection via Rigid Bronchoscopy is a safe and effective treatment for bronchial carcinoid tumors specially in broad based lesions. Cryo-Recanalization has low risk of moderate to massive bleeding and may be superior to thermoablation techniques because it does not have the risk of endobronchial fire and has lower risk of airway perforation. Patients will require long term follow-up to exclude recurrence of disease. Interventional bronchoscopic and surgical approaches should be considered complementary to optimize management of Carcinoid Tumors.

Disclosure of funding source(s): none

Abstract #250

Bronchoscopic Ballon Dilatation in Endobronchial Tuberculosis

P. Prasenohadi^{a*} (Dr), S. Zukhra^a (Dr), AC. Putra^a (Dr)

^a *Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Indonesia, Persahabatan Hospital, Jakarta, INDONESIA*

Background

Balloon bronchoplasty is a procedure central to practice of interventional bronchoscopy. It is easily used with both flexible and rigid bronchoscopy. It may be used with fluoroscopic guidance over a guide wire or under direct vision. Balloon bronchoplasty is most commonly employed with high long term success for non-malignant causes of airway stenosis but it is also in malignant diseases. This technique is generally used in conjunction with other techniques. The balloon should be silicone based and able to provide radial force. The inflation syringe must have a pressure gauge and knowledge of burst pressure must be observed. Complications are generally mucosal tears and minor bleeding but rupture of major airways and vascular structures have been reported.

Case Reports

We report a case of a 20-year-old male with lung tuberculosis and stenosis distal of trachea and right main bronchus. Patient still under treatment with tuberculosis drugs for 8 months. Bronchoscopic balloon dilatation were done twice to dilated the stenosis of the right main bronchus. For the second performed the stenosis was dilated and bronchoscope can be passed. We used flexible bronchoscope under direct vision for this procedure with no complications.

Conclusion

Bronchoscopic balloon dilatation using flexible bronchoscopy under direct vision was useful in airway stenosis due to tuberculosis with no complications and safe.

Key words: bronchoscopic ballon dilatation, airway stenosis

Disclosure of funding source(s): none

Abstract #251

Bronchoscopic treatment of aerodigestive fistulas with ethanol.

C. Disdier^{*a} (Dr), B. De Vega^a (Dr), M. Pérez-Miranda^b (Dr)

^a Hospital Clínico Universitario de Valladolid, Valladolid, ESPAGNE ; ^b Hospital Universitario Río Hortega, Valladolid, ESPAGNE

Introduction: Benign aerodigestive fistula (bADF) is a rare pathology in adults and potentially fatal due to serious nutritional and infectious complications.

Objective: To describe the results of a simple, cheap, repeatable, and effective bronchoscopic technique for the closure of benign tracheoesophageal fistulae.

Material and methods: Retrospective analysis of the efficacy of the use of absolute alcohol with or without the use of tissue glues in patients with bADF. Demographic data, etiology, previous treatments, bronchoscopic sessions, and of long-term bronchoscopic results were recorded.

Results: three patients with benign TEF have been treated for mediastinal tuberculosis, complications after surgery for esophageal carcinoma, and secondary to mediastinal Hodgkin lymphoma after treatment with polychemotherapy. The first patient was treated with a complete antituberculous regimen before endoscopic treatment and the other two with different types of esophageal stents without success. In all cases, percutaneous gastric or jejunal tube feeding was performed until the fistula was sealed. The three cases were treated with 2, 3, and 6 sessions of absolute alcohol injections with an interval of not less than 3 weeks before achieving definitive closure. No complications were recorded.

Conclusion: The injection of absolute alcohol is a safe, simple, and cheap treatment in the treatment of FADb. Several sessions are necessary and it requires prolonged nutritional support through percutaneous enteric tubes until definitive closure

Disclosure of funding source(s): none

Abstract #252

Treatment with endobronchial valves of persistent air leak in patients with pleural empyema.

C. Disdier^a (Dr), B. De Vega-Sanchez^a (Dr), D. Vielba^a (Dr), I. Ramos^a (Dr), A. García-Onieva^a (Dr), S. Jaurrieta^a (Dr), M. Belver^a (Dr), S. Juarros^a (Dr), E. Rodriguez-Flores^a (Dr), C. Rodriguez-Dupuy^a (Dr), S. Fernandez-Gay^a (Dr)

^a Hospital Clinico Universitario de Valladolid, Valladolid, ESPAGNE

Introduction: Pleural empyema associated with alveolopleural fistula (APF) is an entity with high morbidity and mortality. The objective of the study was to evaluate the efficacy and safety of treatment with endobronchial valves (EBV) in patients with empyema and APF.

Material and methods: From 1/1/2016 to 2/28/2021, all patients with pleural space infection and persistent air leak due to APF were prospectively studied. Prolonged leak (PL) was defined as persistent air drainage for more than 7 days. The therapeutic protocol included endothoracic drainage and antibiotic treatment. The leak location was performed by chest CT followed by bronchoscopy. Demographic characteristics, etiology, associated comorbidity, safety, and efficacy of APF treatment using endobronchial valves were analyzed.

Results 19 patients whose characteristics are described were included. 13 patients had active neoplasia and another two had neoplasms with complete response. Two patients had open thoracostomy. 38 germs were identified in pleural fluid and in 10 patients the infection was polymicrobial. 14 patients were treated with EBV and 24 valves were inserted. The median days between the diagnosis of the PL and the placement of the EBV was 31.5 days. Leak cessation was achieved in 11 patients (immediate and sustained in 4) after EBV placement, and the median time from EBV insertion to complete leak cessation was 11 days. In 8 patients, drainage removal was possible with a median of 54 days after valve insertion. One patient died during admission due to nosocomial COVID19 infection without improvement after EBV, and 3 patients died during the 6-month follow-up. Two patients suffered a recurrence of APF. Treatment with EBV in patients with empyema and APF was completely successful in 8 patients (57%) and partial in 5 more (35.7%).

Conclusions EBV treatment in patients with FAP and empyema is a safe and effective treatment

Disclosure of funding source(s): none

Abstract #253

Bronchoscopy Balloon Dilation in Endobronchial Tuberculosis with Airway Stenosis: A Case Series

IA. Pratiwi*^a (Mme), M. Elhidsi^a (Dr), D. Soehardiman^a (Dr), P. Prasenhadi^b (Dr)

^a Pulmonology and Respiratory Medicine, Faculty of Medicine Universitas Indonesia - Persahabatan Hospital, East Jakarta, INDONESIA ; ^b Pulmonology and Respiratory Medicine, Faculty of Medicine Universitas Indonesia - Persahabatan Hospital, East Java, INDONESIA

Introduction: Endobronchial tuberculosis (EBTB) is an extra pulmonary tuberculosis form which defined as tuberculosis infection of the tracheobronchial tree with microbial and histopathological evidence. The most common complication of EBTB is airway stenosis. We report two cases of the role of bronchoscopy balloon dilation in EBTB.

Case Report: Case 1: A 31 years old woman with stridor, dyspnea, cough and weight loss. CT scan finding showed atelectasis in right superior lobe. Xpert MTB/RIF from sputum sample was negative. Histopathological finding from bronchus biopsy showed chronic granulomatous inflammation caused by MTB. Bronchoscopy finding showed cicatrix closing almost total mid trachea and total right main bronchus, right upper lobe and truncus intermedius. Balloon dilation and steroid injection were performed three times. Anti TB regiment with RHZE/RH was administered. She is now on fourth months of anti-TB drug. She experienced recurrent stridor and dyspnea one month after second balloon dilation and had to do emergency third balloon dilation, steroid injection and rigid scope dilation. She had complication of tracheal laceration in third ballooning. Case 2: A 17 years old girl with dyspnea, productive cough and mild fever. Xpert MTB/RIF from bronchial washing sample was MTB positive with Rifampicin sensitive. CT scan finding showed atelectasis in right lung. Bronchoscopy finding showed cicatrix closing almost total right main bronchus. Balloon dilation were performed twice. She is now on eight months of anti TB drugs. Immediate symptoms improvement was experienced in both cases.

Conclusion: Bronchoscopy balloon dilation and anti TB drugs were main therapy in EBTB and airway stenosis. Bronchoscopy balloon dilation gave immediate symptoms relieve. Recurrent procedure might be performed to optimize the treatment.

Disclosure of funding source(s): none

Abstract #254

Profile of malignant pleural effusion: experience of the Pulmonary Department of ANNABA University Hospital Center

B. Terra^{*a} (Dr), F. Atoui^a (Dr), R. Yakoubi^a (Dr), F. Kalloufi^a (Pr)

^a Pulmonary Department ,ANNABA University Hospital Center, Annaba, ALGÉRIE

Introduction: Due to its frequency, its economic impact and its repercussions on the patient's quality of life, neoplastic pleural pathology represents a public health concern. Given the predominance of secondary pleural neoplastic involvement, epidemiological and diagnostic discrepancies are noted. The aim of the present investigation is to describe the epidemiological and diagnostic profile of metastatic pleural effusion treated at the Pulmonary Department of ANNABA University Hospital Center.

Materials and method: Retrospective study of all patients with malignant pleural effusion treated between January 2020 and August 2021. For each patient, anamnestic, clinical, paraclinical, and therapeutic data were collected from the medical records.

Results: 47 cases were collected, including 30 women. The mean age was 62.17 years (17-82 years). Tobacco exposure was identified in 12 patients and a history of cancer in 21 patients. The clinical symptoms were dominated by dyspnea and chest pain. Pleural metastases were indicative of cancer in 27.65%. The pleural fluid was haemorrhagic in 48.93% of cases. 34.04% of the metastatic pleural effusions were of undetermined origin. The most important primitive locations found were the breast (25.53%) and the lungs (10%). The local treatment is essentially based on the evacuation of pleural punctures in connection with palliative chemotherapy.

Conclusion: Treatment of pleural metastases requires appropriate diagnostic tools, including immunohistochemistry. In addition, the etiological profile dominated by breast cancer and bronchopulmonary carcinoma requires optimization of prevention and early detection measures.

Disclosure of funding source(s): none

Abstract #255

Low cost for high diagnostic yield: a cohort of 435 patients who underwent transtracheal or transbronchial needle aspiration with Schieppati rigid needle.

MA. Saab^{*a} (Dr), A. Branda^a (Dr), A. Ortiz Nareto^a (Dr), I. Martin^a (Dr), MC. La Piettra^a (Dr), A. Briozzo^a (Dr), S. Gando^a (Dr), P. Simkin^a (Dr), D. Violi^a (Dr), B. Vazquez^a (Dr), M. Korsunsky^a (M.), G. Martinez^a (Dr), A. Sansoster^a (Dr), R. Dure^a (Dr)

^a Hospital F.J. Muñiz, Buenos Aires, ARGENTINE

Background:

Transtracheal sampling of mediastinal structures using a reusable rigid aspirative needle (RAN) through rigid bronchoscopy (RB) was described in 1949 by Eduardo Schieppati to diagnose lesions adjacent to central airways (CA). Although this technique has been gradually replaced by newer technologies in high income countries, it remains an affordable tool in many developing economies.

Methods:

In a retrospective cohort, procedures using RAN (May 2010 to December 2021) were reviewed. Patient data were collected from our internal database and cross-checked with cytological tests results. It included adults with enlarged mediastinal nodes or pulmonary lesions over 2 cm accessible via CA. Specimen collection using RAN was conducted by interventional pulmonologists trained in RB in patients under conscious sedation and spontaneous ventilation, with a minimum of 3 samples collected per procedure.

Results:

Of the 435 patients whose data were analyzed, 70,1% were men with a median age of 58. Most (55,4%) were referred to obtain diagnosis of a mediastinal lymphadenopathy or mass, followed by a 33,6% with a pulmonary mass under study or a combination of both lesions (6,2%).

A representative sample was obtained in 84,6% of procedures and the overall diagnostic yield was 79,8%, being lung cancer infiltration the most common (44,4%) finding. Other diagnoses included nodal tuberculosis (12,4%), infiltration by another cancer (9,7%), sarcoidosis (2,5%) and other infections (2,3%). No correlation was found between the absence of airway alterations during bronchoscopy (43,9%) and a lesser chance of achieving nodal disease diagnosis or a good quality sample.

Only 8,8% of patients registered mild procedure-related complications (transient desaturation and self limited bleeding).

Conclusion:

Sample collection via RAN in trained hands is a safe and cost-effective method to diagnose mediastinal or central pulmonary lesions when disposable aspiration needles or ultrasound guided technologies are not available.

Disclosure of funding source(s): none

Abstract #256

Bronchoscopic management of tracheo-bronchial stenosis due to tuberculosis : A retrospective study in a tertiary care hospital in India

S. Jain^{*a} (Dr), V. Nanda^a (Dr), M. Pilaniya^a (Dr), S. Gupta^a (Dr)

^a *Ramkrishna Care Hospital, Raipur, INDE*

Background : Tracheo-bronchial stenosis due to tuberculosis (TSTB) is a rare complication of endobronchial TB. Despite the decline in pulmonary tuberculosis with the advent of effective chemotherapy, TSTB continues to be under-recognized, under-diagnosed and often misdiagnosed. Surgical treatment had been advocated to be the best modality for treatment of these cases. However, there are studies which suggests that bronchoscopic treatment of TSTB can be done with good results.

Methods : We present our experience of bronchoscopic management of tracheo-bronchial stenosis due to tuberculosis (TSTB), over a period of 3 years (2019-2021). During this period we had 9 patients with tracheo-bronchial stenosis due to tuberculosis, who were treated by flexible bronchoscopic dilatation in our department. These patients were aged between 16 to 47 years. 6 patients were male and 3 patients were female. 4 patients had left main bronchial stenosis (2 of them also had left upper lobe bronchial stenosis and 1 had lower tracheal stenosis), 1 patient had right main bronchial stenosis, 2 patients had left upper lobe bronchial stenosis, 1 patient had right upper lobe bronchial stenosis and 1 patient had right middle lobe bronchial stenosis. All patients underwent flexible bronchoscopic dilatation of the tracheo-bronchial stenosis successfully. Mercedes-Benz incision was done in 5 cases with web-like stenosis of the bronchus. Serial CRE balloon dilatation was done in all cases. Mitomycin-C was applied locally in all patients post-dilatation.

Results : All patients with tracheo-bronchial stenosis due to tuberculosis could be successfully treated by bronchoscopic dilatation. None of these patients had any post-procedural complications.

Conclusion : Bronchoscopic dilatation is an effective treatment option for patients with tracheo-bronchial stenosis due to tuberculosis (TSTB). Large prospective studies are needed to assess the long term outcome of this treatment.

Disclosure of funding source(s): none

Abstract #257

Safety and Diagnostic Outcome of Radial Probe Endobronchial Ultrasound-guided Transbronchial Lung Biopsy

E. Bae^a (Dr), YS. Park^a (Pr), J. Cho^a (Pr)

^a Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Seoul National University Hospital, Seoul, CORÉE, RÉPUBLIQUE DE

Background: Radial probe endobronchial ultrasound (radial EBUS) is widely used for the diagnosis of pulmonary lesions. However, the diagnostic value of radial EBUS-guided transbronchial lung biopsy varies, and its complications, especially the risk of bleeding, are not well studied. In this study, we evaluated the diagnostic outcomes and complication rate of this procedure and investigated the risk factors associated with procedure-related bleeding events.

Methods: This retrospective study included consecutive patients who underwent radial EBUS-guided transbronchial lung biopsy from December 2019 to June 2022. Radial EBUS was performed under moderate sedation in inpatients and outpatients. The severity of bleeding was graded by the Delphi consensus statement.

Results: Of a total of 127 patients (mean age, 67.6 years; men 59.1%), outpatients accounted for 32.8%. The diagnostic accuracy, sensitivity, and specificity for malignancy were 71.7% (63/113), 66.3% (63/95), and 100% (18/18), respectively. Twenty eight patients (22%) developed complications (pneumothorax, 3; pneumonia 6; complicated pleural effusion, 3; bleeding event grade 2 or higher, 21). Among the 41 outpatients, only 2 patients developed complications (pneumothorax without intervention, 1; grade 2 bleeding event, 1). Of the 21 patients (16.5%) with procedure-related bleeding events, 18 patients had grade 2, and only 3 had grade 3 bleeding complications. In a multivariable analysis, large size of lung lesion over 30mm (adjusted odds ratio (OR) 5.02, $P=0.033$) and the procedure time of more than 25 minutes (adjusted OR 3.40, $P=0.045$) were significantly associated with the risk of grade 2 or higher bleeding events. The risk of bleeding was significantly reduced when the lung lesion was located in the distal third of the lung (adjusted OR 0.29, $P=0.038$).

Conclusion: Radial EBUS-guided transbronchial lung biopsy is the accurate and safe diagnostic method. Procedure-related bleeding event was associated with central location and large size of lung lesion and long duration of the procedure.

Disclosure of funding source(s): none

Abstract #258

Comparison between endobronchial ultrasound-guided transbronchial needle aspiration cytology versus histology for the diagnosis of lung cancer

SM. Jo^{*a} (Dr), YS. Park^a (Pr)

^a Seoul National University Hospital, Seoul, CORÉE, RÉPUBLIQUE DE

Background: Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) can obtain samples for both histology and cytology results. It is known that histology is a more reliable exam for the diagnosis of mediastinal lymph node metastasis. This study aims to investigate the diagnostic role of cytology in EBUS-TBNA for lung cancer.

Methods: This retrospective study was conducted on adult (≥ 19 years) patients who have been diagnosed with lung cancer at Seoul National University Hospital and were examined by EBUS-TBNA from May 2010 to December 2019. The histology and cytology samples were matched one to one. A total of 5492 lymph nodes were analyzed.

Results: Of the 2176 lung cancer patients, there were more males (1597, 73.4%), and smokers (1588, 73.0%). The mean age was 68 years old. The most common pathologic subtype was adenocarcinoma (51.9%), followed by squamous cell carcinoma (29.8%), other non-small cell lung cancer (10.0%), and small cell lung cancer (8.3%). The 4R lymph node (1644, 29.9%) was the most common aspiration site, followed by the subcarinal 7 lymph node (1608, 29.3%).

The discrepancies between the cytology and histology were 10.8%. However, in 130 (3.4%) nodes showing negative or insufficient results in histology, malignant cells were observed in cytology slides.

Conclusion: The cytology of EBUS-TBNA have diagnostic power in lung cancer.

Disclosure of funding source(s): none

Abstract #259

Ecmo facilitated bronchoscopic debulking of carinal tumor with near total obstruction of both main bronchi

M. Pattanaik^a (Pr), MK. Pattnaik^b (Pr), JK. Patra^a (Dr), AK. Sahoo^c (Dr), SP. Sahoo^b (Dr), OK. Jha^a (Dr), J. Patnaik^a (Pr), SK. Nanda^a (Dr), BR. Reddy^a (Dr)

^a Department of Pulmonary Medicine, SCBMCH, Cuttack, INDE ; ^b Department of CTVS, SCBMCH, Cuttack, INDE ;

^c Department of Anaesthesiology, SCBMCH, Cuttack, INDE

Background : Debulking of Central airway tumor with near total obstruction is a high risk procedure. Treatment modalities which include surgery, Mechanical debulking or electro-thermal ablation using rigid and/or flexible bronchoscope has been reported with variable peri-procedure complications. Here, we report a case of bronchoscopic management of carinal tumor with near total obstruction of both main bronchi using electrocautery and cryotherapy under ECMO support.

Case Report: A 35-year-old female presented with 3-months history of cough and progressive breathlessness with orthopnea. At presentation, she had tachycardia, tachypnea, hypertension, decreased breath sound over right hemithorax with bilateral monophonic rhonchi. Chest x-ray revealed right middle and lower lobe collapse. CECT-thorax showed lobulated enhancing endobronchial mass lesion in carina with near complete obliteration of right and left main bronchi and obstructive collapse of right middle and lower lobe. Bronchoscopy showed a large lobulated tumor over carina extending to both main bronchi with near complete obstruction. After a multidisciplinary discussion involving pulmonologists, cardiothoracic surgeons, cardiac anaesthetist, patient was taken for bronchoscopic debulking in CTVS OT under VV-ECMO Support. Under general anaesthesia patient was intubated with a 12-mm rigid tracheoscope and connected to anaesthesia ventilator. Video-bronchoscope was introduced through rigid tracheoscope and then cryo-therapy was applied over the tumor. Tumor debulking was done on both sides using electrocautery snare and cryo-extraction was done. Blunt electrocautery probe was used to further open up the obstructed left main and right main bronchi to achieve more than 60% lumen. No significant hypoxia or bleeding at debulked tumor site was noted. Patient was shifted to ECMO ICU where ECMO support was weaned on POD1 and patient was successfully extubated on POD2.

Conclusion: Multimodality, multidisciplinary approach may be instrumental in safe management of central airway obstruction. Role of ECMO may be evaluated for avoiding procedural complications in selected cases.

Disclosure of funding source(s): none

Abstract #260

Chest tube drainage: tips, tricks and drawback

M. Rasmin^{*a} (Pr)

^a *Dept. of Pulmonology & Respiratory Medicine Faculty of Medicine Universitas Indonesia - Persahabatan Hospital, Jakarta, INDONESIA*

Pneumothorax and pleural effusion are two common conditions that usually needs a drainage. For a long period, water sealed drainage (WSD) with a large bore chest tube (LBCT) was the only one to be chosen before the small bore chest tube (SBCT) was found. This catheter also known as pig tail catheter and later, another chest tube drainage (CTD) was created, the indwelling pleural catheter (IPC). All are proven useful to be used but the equipment especially those new type catheters availability, the ability of the operator and patient choice are among factors that decide. All kind of those catheter can be placed using local anesthesia and for the last two type drainage catheter (SBCT and IPC) the procedure can be done as an outpatient base. Some complications can be happened for all type of catheter i.e pain, infection, dislodgment. Chest X-ray or ultrasonography still needed before withdrawing the chest tube, while clamp is not always needed.

Disclosure of funding source(s): none

Abstract #261

Case Report: Medical thoracoscopy in the intensive care unit

A. Sweidan^{*a} (Dr), N. Patel^a (Dr), J. Longoria^a (Dr)

^a *University of California, Irvine, Orange, California, ÉTATS-UNIS*

Case Report: A 54-year-old male with ARDS from COVID-19 pneumonia developed a persistent pneumothorax. Computed tomography of the chest showed loculations and adhesions. Medical thoracoscopy (MT) was pursued. An anterior and posterior 28 French chest tube was placed under thoracoscopic guidance. The right lung surface was covered with necrotic exudate actively spewing out purulent secretions consistent with an empyema. We discuss the utility of MT in the ICU by Interventional Pulmonology.

Background: Chest tube drainage is the cornerstone in therapy for complex pneumonic effusions. MT in the ICU can be safe and effective in the treatment of pleural infections (1). MT allows the physician to perform pleural biopsy with high accuracy, drain loculated pleural effusion, and guide chest tube placement. As compared to video-assisted thoracoscopy surgery (VATS), MT is less invasive, does not require single lung ventilation, has a comparable diagnostic yield, and is better tolerated by the patients (1). A recent trial comparing intrapleural fibrinolytic therapy versus MT has shown that MT can shorten length of stay (2). MT also facilitates installation of sclerosants into the pleural space for the treatment of persistent air leaks. This induces an inflammatory reaction designed to achieve pleurodesis via fusion of the visceral and parietal pleura (1). Relative contraindications for performing MT in the ICU include severe hypoxemia, stage 3 empyema, uncorrectable coagulopathy, history of pleurodesis and involvement of contralateral lung (2).

Conclusion: This case report exemplifies the utility of the IP physician in improving patient outcomes within the ICU by diagnosing and treating a challenging BPF in a clinically challenging scenario.

1. Hu K et al. Management of complex pleural disease in the critically ill patient. doi: 10.21037/jtd2021-3
2. Kheir F et al. Intrapleural Fibrinolytic Therapy versus Early Medical Thoracoscopy for Treatment of Pleural Infection. Randomized Controlled Clinical Trial. PMID: 32421353

Disclosure of funding source(s): none

Abstract #262

Diagnostic performance of new single-use cryoprobes for peripheral pulmonary lesions

Y. Matsumoto^{*a} (Dr), T. Imabayashi^b (Dr), K. Uchimura^b (Dr), H. Furuse^b (Dr), T. Tsuchida^b (Dr)

^a Department of Endoscopy, Respiratory Endoscopy Division/Department of Thoracic Oncology, National Cancer Center Hospital, Tokyo, JAPON ; ^b Department of Endoscopy, Respiratory Endoscopy Division, National Cancer Center Hospital, Tokyo, JAPON

Background: Additional cryobiopsy to conventional biopsy methods has been reported to increase the diagnostic yield of peripheral pulmonary lesions (PPLs). Recently introduced single-use cryoprobes have superior inducibility to conventional reusable cryoprobes due to their smaller diameters, and are expected to lead high diagnostic yields on their own. We have therefore applied the new cryoprobes alone to the diagnosis of PPLs, and aimed to investigate their utility.

Methods: Consecutive patients who underwent cryobiopsy for PPLs at our institution between June 2017 and April 2022 were retrospectively reviewed while divided into two groups: single-use cryoprobes alone (single-use group) and reusable cryoprobes combined with standard biopsy devices (reusable group). Cases with certain benign pathological findings but immature course were excluded. A multivariable analysis was performed to examine factors that affected the diagnostic yield. In addition, diagnostic outcomes were compared after balancing characteristics between the two groups by propensity score matching.

Results: We analyzed a total of 825 cases, 216 with single-use and 609 with reusable cryoprobes. The median (range) size of lesions was 22.5 (4.9-120.8) mm, and 25.6% was negative for bronchus sign. The morphology was mainly solid (47.5%), followed by part-solid (45.5%) and pure ground-glass (7.0%). The overall diagnostic yield was 89.2%, and only the positive bronchus sign contributed to it in the multivariable analysis ($p < 0.001$, odds ratio=2.75 [95% confidence interval=1.61-4.69]). After matching, 214 pairs of cases in each group were selected. Among them, the diagnostic yield in the single-use group was comparable to that in the reusable group (86.0% vs. 87.4%, $p=0.670$), as well as the complication rates (5.1% vs. 2.8%, $p=0.213$). Meanwhile, the mean \pm standard deviation procedure time was shorter in the single-use group (29.9 \pm 10.4 min. vs. 32.3 \pm 9.2 min., $p=0.013$).

Conclusion: Single-use cryoprobes showed sufficient performance even alone in the diagnosis of PPLs.

Disclosure of funding source(s):

This study was partially supported by the National Cancer Center Research and Development Fund (29-A-13/2020-A-12).

Abstract #263

Safety and feasibility of a novel externally cooled bronchoscopic radiofrequency ablation catheter for ablation of peripheral lung tumours: a first-inhuman dose escalation study

D. Steinfors^{*a} (Pr), P. Antippa^a (Pr), K. Rangamuwa^a (Dr), L. Irving^a (Pr), M. Christie^a (Dr), E. Chan^b (Pr), D. Tanaka^c (M.), K. Yoneda^d (Pr), F. Herth^e (Pr), S. Raina^f (Dr)

^a The Royal Melbourne Hospital, Parkville, AUSTRALIE ; ^b Alfred Health, Melbourne, AUSTRALIE ; ^c EOLO Medical, Cupertino, ÉTATS-UNIS ; ^d UC Davis Health, Sacramento, ÉTATS-UNIS ; ^e University of Heidelberg, Heidelberg, ALLEMAGNE ; ^f Zidan Medical, Santa Clara, ÉTATS-UNIS

Background

Surgical lobectomy remains preferred therapy for early-stage non-small cell lung cancer (NSCLC). Comorbidities and advanced age preclude resection in many patients. Radiofrequency ablation (RFA) is an effective modality for percutaneous ablation of NSCLC. We have developed a novel RFA Catheter with externally cooled electrode for ablation of pulmonary lesions.

Methods

Single arm treat-and-resect study. Biopsy-confirmed NSCLC. Procedures were performed under general anaesthesia with neuromuscular blockade. The RFA catheter was delivered bronchoscopically to peripheral parenchymal NSCLC lesions, guided by radial EBUS, and intra-procedural cone beam CT. Participants underwent lobectomy 7 days post-ablation. Pre-op CT chest and histologic examination of resected specimens established distribution/uniformity of ablation and efficacy of tumour ablation.

Results

Seven patients underwent RFA of NSCLC (median size 2.5cm, range 1.7-3.1cm) with sequential dose escalation. Uniform ablation was achieved within ablation zones, including tumour in all cases. Gravitydependent extension of ablation was frequently seen. Proportion of tumour ablated ranged from 8-72%, a dose-response (energy-ablation volume) relationship was observed.

Conclusion

Bronchoscopic RFA using externally cooled catheter is safe, feasible, and achieves uniform ablation within treatment zones at relatively low energy levels. Use of increased energy levels, and improved targeting/overlap of ablation zone to target lesion is expected to improve ablative efficacy. Future studies with a modified catheter are planned.

Disclosure of funding source(s):

This work was supported by Zidan Medical.

Abstract #264

The significance of non-specific pleuritis: a single-center experience

F. Porcarelli*^a (Dr), F. Mei^a (Dr), L. Zuccatosta^b (Dr), M. Bonifazi^a (Pr), S. Gasparini^a (Pr)

^a Department of Biomedical Sciences and Public Health, Università Politecnica delle Marche, Ancona, ITALIE ; ^b Pulmonary Diseases Unit, Azienda Ospedaliera Universitaria Ospedali Riuniti, Ancona, ITALIE

Background

Non-specific pleuritis (NSP) is a broad term that describes chronic pleural inflammation without specific etiology. Various conditions may lead to this histological finding, posing a diagnostic challenge for clinicians, as a significant proportion of patients develop a malignant diagnosis, being mesothelioma the commonest. The aim of the study is to assess the long-term outcome of patients with NSP focusing on 'false negative' cases.

Methods

We retrospectively collected data from patients admitted to our Pulmonology Unit - Ospedali Riuniti (Ancona, Italy) from January 2015 to December 2021 for undiagnosed pleural effusion who underwent medical thoracoscopy (MT). We selected patients with histological diagnosis of NSP. Patients with alternative diagnosis were excluded. Follow up included visit, thoracic ultrasound scanning and, if needed, imaging.

Results

Out of a total of 393 thoracoscopies, 83 patients had the histological diagnosis of NSP. Mean follow-up time was 28,5 months. After a first diagnosis of NSP, 10 patients received a subsequent diagnosis of specific benign conditions (i.e. infection, drugs, autoimmunity) and 6 (7%) patients received diagnosis of pleural malignancy, most of them (85%) were mesothelioma. All malignancies were diagnosed within first 12 months. Remaining 67 patients (81%) were deemed as affected by idiopathic pleuritis and all of them followed truly benign evolution.

Conclusions

Our findings are largely in line with the established body of literature, confirming good prognosis in the majority of cases with histological diagnosis of NSP. The data underline the need of a close and prolonged follow-up in these patients, in order to detect a not negligible rate of malignancy.

Disclosure of funding source(s): none

Abstract #266

Pulmonary Actinomycosis: A Rare Route for Spread of Infection.

H. Dawood*^a (Dr)

^a *Rambam Health Care Campus, Haifa, ISRAËL*

Background: Pulmonary actinomycosis is a rare and challenging medical condition, generally affecting patients with poor dental hygiene, dental abscess and facial lesions. Nevertheless, patients without classic risk factors may also suffer from the disease.

Case Report: We report the case of a 70-year-old woman who presented to our unit with chronic cough, hemoptysis and right lung consolidation. In addition, she suffered from a peritoneo-cutaneous fistula following cholecystectomy due to leftover stones. Eventually, she was diagnosed with pulmonary actinomycosis.

Conclusion: Pulmonary actinomycosis should be considered in patients with chronic pulmonary consolidation without classic risk factors, such as chronic abdominal or cutaneous infection. Other fashions of infections, such as abdominal-pleural dissemination, especially when a pleural effusion is present, should be kept in mind. Treatment with intravenous penicillin followed by oral amoxicillin led to a recovery in both sites of infection.

References

- Mabeza GF, Macfarlane J. Pulmonary actinomycosis. *EurRespir J* 2003; 21 (3): 545- 51. Rippon JW.. *Medical Mycology In: Wonsiewicz MJ, ed. The Pathogenic Fungi and the Pathogenic Actinomycetes. 3rd edn Philadelphia, W.B. Saunders Co., 1988; pp. 30-52.*
- Farrokh D, Rezaitalab F, Bakhshoudeh B. Pulmonary actinomycosis with endobronchial involvement: a case report and literature review. *Tanaffos. 2014;13(1):52-56.*
- Russo TA. Agents of actinomycosis. In: Mandell GL, ed. *Principles and Practice of Infectious Disease. 5th edn. New York, Churchill Livingstone, 1995; pp. 2645-2654.*
- Valour F, Sénéchal A, Dupieux C, et al. Actinomycosis: etiology, clinical features, diagnosis, treatment, and management. *Infect Drug Resist. 2014; 7:183-197. Published 2014 Jul 5.*
- Zeebregts CJ, van der Heyden AH, Ligtoet EE, Wagenaar JP, Hoitsma HF. Transphrenic dissemination of actinomycosis. *Thorax. 1996;51(4):449-450.*
- Lee JP, Rudoy R. Pediatric thoracic actinomycosis. *Hawaii Med J* 2003; 62 (2): 30- 2.
- Brook I. Actinomycosis: diagnosis and management. *South Med J* 2008; 101 (10): 1019-23.

Disclosure of funding source(s): none

Abstract #268

Automatic identification and segmentation of mediastinal lymph nodes and blood vessels in endobronchial ultrasound (EBUS) using a deep neural network

O. Ervik^a (Dr), I.E. Tveten^b (Mlle), E.F. Hofstad^b (M.), H. Sorger^a (Dr)

^a Nord-Trøndelag Hospital Trust, Levanger Hospital, Clinic of Medicine, and Norwegian University of Science and Technology, Faculty of Medicine, Department of Circulation and Medical Imaging, Levanger, NORVÈGE ; ^b Department of Health Research, SINTEF Digital, Trondheim, Norway, Trondheim, NORVÈGE

Background

Endobronchial ultrasound transbronchial needle aspiration (EBUS-TBNA) from thoracic lymph nodes is essential in lung cancer investigation, to select patients for curative therapy and avoid wrong treatment decisions. Each lymph node must be repeatedly localized and sampled, challenging the bronchoscopist's technique. To improve EBUS-TBNA precision, we propose a deep neural network (DNN) that identifies lymph nodes and blood vessels examined with EBUS.

Methods

Nineteen patients referred to Levanger Hospital for EBUS-TBNA were prospectively enrolled. Ultrasound (US) video was recorded from the EBUS processor (Olympus EVIS EXERA III) to a laptop computer. Mediastinal and hilar lymph nodes were imaged by EBUS (Olympus BF UC190F) and lymph node stations were labeled in real-time by the bronchoscopist according to their anatomical level. Postprocedurally, a bronchoscopy expert selected static images from the EBUS videos and annotated lymph nodes and vessels using a spline segmentation technique. US images with annotations from fifteen patients were used to train a DNN (U-Net). The performance of the network was evaluated on the remaining four patients.

Results

In total, 510 US frames from nineteen patients were annotated. For segmentation of lymph nodes and blood vessels, respectively, the Dice similarity coefficient was 0.73 and 0.69, precision was 0.74 and 0.73, recall was 0.66 and 0.64, and F1 score was 0.70 and 0.68. Average run-time of processing and segmentation per US frame was 93 ± 6 ms on a laptop with CPU and built-in GPU (Intel® UHD Graphics) using OpenVINO for inference.

Conclusion

Segmentation of EBUS lymph nodes and vessels using a DNN was feasible and fast, making real-time automatic labeling possible. We will further aim to improve segmentation quality and develop software for intraoperative labeling of lymph nodes and vessels during EBUS-TBNA. A dataset from a second hospital is currently prepared for method testing and validation.

Disclosure of funding source(s):

This work was funded by the The Liaison Committee for education, research and innovation in Central Norway and Norwegian National Research Center for Minimally Invasive and Image-Guided Diagnostics and Therapy, St. Olavs hospital, in collaboration with NTNU and SINTEF.

Abstract #269

Utilizing robotic assisted bronchoscopy and endobronchial ultrasound to successfully biopsy a para-aortic lymph node

M. Macdougall^a (Dr), R. Feng^a (Dr), A. Sweidan^a (Dr), N. Patel^a (Dr), J. Longoria^a (Dr)

^a UCI Medical Center, Orange, ÉTATS-UNIS

BACKGROUND:

The diagnosis of indeterminate aortopulmonary (AP) window lymph nodes is challenging due to the position of the aorta and the left pulmonary artery. We describe a combined approach using both a shape-sensing robotic-assisted bronchoscopy (SSRAB) and an endobronchial ultrasound (EBUS) scope to biopsy a paraaortic lymph node (LN) without traversing the aorta.

CASE REPORT:

A 79-year-old female with squamous cell cancer of the neck and melanoma presented with four years of persistent PET avid AP window. The initial EBUS guided-FNA (fine needle aspiration) of the para-aortic LN was negative for metastasis. She was treated with resection and immunotherapy, but the LN continued to be FDG avid. Therefore, she was referred to Interventional Pulmonary for a repeat biopsy. At this time, the mediastinal blood pool was 1.6 SUV, the hepatic blood pool was 2.2, and the lesion was 6.75.

The SSRAB was utilized to access the para-aortic LN and positioning was confirmed with radial EBUS. Transbronchial needle aspirations were performed. The EBUS scope was then used to biopsy the node as the robotic bronchoscope turns were too sharp to successfully pass the instruments. Biopsy from the combined approach resulted in a successful diagnosis, confirming metastasis of the patient's malignant melanoma.

CONCLUSION:

Typically, aortopulmonary window lymph nodes are accessed surgically. While these stations and the surrounding structures can be visualized with EBUS, accessing the nodes for biopsy without passing through the aorta is not feasible. However, by combining SSRAB and an EBUS scope, we were able to biopsy paraaortic LN without traversing the aorta. This technique allowed for an accurate diagnosis to be made with less risk than the surgical approach.

SOURCES:

Ravaglia, Claudia et al. "Diagnostic Yield and Safety of EUS-FNA Biopsy in Sub-Aortic and Para-Aortic Lymph Node Stations with the Trans-Aortic Approach: a Case Series and Literature Review."

Disclosure of funding source(s): none

Abstract #270

Diagnostic impact of visualized lesion extent by radial endobronchial ultrasound on forceps biopsy for peripheral pulmonary lesions

H. Furuse^a (Dr), Y. Matsumoto^{*b} (Dr), K. Uchimura^a (Dr), T. Imabayashi^a (Dr), T. Tsuchida^a (Dr)

^a Department of Endoscopy, Respiratory Endoscopy Division, National Cancer Center Hospital, Tokyo, JAPON ; ^b Department of Endoscopy, Respiratory Endoscopy Division/Department of Thoracic Oncology, National Cancer Center Hospital, Tokyo, JAPON

Background: It is essential to visualize target peripheral pulmonary lesions (PPLs) sufficiently by radial endobronchial ultrasound (R-EBUS) in diagnostic bronchoscopy using forceps. Otherwise, transbronchial needle aspiration (TBNA) and cryobiopsy have been reported effective for improving the diagnostic outcomes, but the appropriate boundary of the decision is unclear. Therefore, we aimed to identify the boundary based on R-EBUS images.

Methods: Consecutive patients who underwent forceps biopsy for PPLs using R-EBUS between June 2015 and May 2017 were retrospectively reviewed. Cases in which R-EBUS showed invisible or blizzard sign and those who underwent TBNA/cryobiopsy were excluded. The angle where the lesion covered the R-EBUS probe was defined as “contact angle”, and it was measured using an ImageJ based on captured R-EBUS images. Factors affecting the diagnostic yield were statistically analyzed, including the contact angle. Moreover, the relationship between the angle changes and the diagnostic yields was evaluated.

Results: We analyzed a total of 835 lesions, with the median size of 26.8 (range 7.1-121.0) mm. Entirely and partially circumferential R-EBUS images were observed in 471 (56.4%) and 364 (43.6%) cases, respectively; the corresponding diagnostic yields were significantly higher in the former (92.1% vs. 60.4%, $p<0.001$). Univariable analyses revealed that the increased contact angle was significantly associated with the successful diagnosis ($p<0.001$) in addition to the larger lesion size, positive bronchus sign, and visible on chest radiography. In the multivariable analysis, only the increased contact angle was the significant factor (10 degrees change, odds ratio 1.095 [95% confidence interval 1.076-1.115], $p<0.001$). The area under the receiver operating curve of the contact angle to the diagnostic yield was 0.770, and the optimal cut-off value was 310 degrees.

Conclusion: The contact angle by R-EBUS was significantly associated with the diagnostic yield of PPLs using forceps, with the cut-off value of 310 degrees.

Disclosure of funding source(s): none

Abstract #271

A rare case of Birt Hogg Dube Syndrome presenting as recurrent pneumothorax

A. Selvam^{*a} (Dr), Y. Sivagnaname^a (Pr), P. Radhakrishnan^a (Dr)

^a Sri Manakula Vinayagar Medical College and Hospital, Puducherry, INDE

BACKGROUND:

Birt-Hogg-Dubé syndrome (BHD) is a rare inherited disorder caused by mutations in the folliculin coding gene (FLCN), characterised by multiple fibrofolliculomas, pulmonary cysts, pneumothorax, renal cysts and renal tumours.

CASE REPORT: A 29-year-old female came with complaints of breathlessness and dry cough for past 7 days which is insidious onset and progressive in nature. She also had left sided dull aching chest pain. She was a breastfeeding mother and had breathlessness in postpartum period. She is non-smoker with no co-morbidities. On examination, there was no visible cutaneous lesions. Her vitals were stable with pulse oximetry saturation of 95% @ room air. Routine blood investigations were normal. Chest auscultation revealed reduced breath sound intensity on right hemithorax. Chest radiography showed right pneumothorax and intercostal drain was inserted. Patient symptomatically improved. Computed tomography thorax showed multiple thin walled lentiform shaped and irregular cysts in the right lower lobe posterior basal segment. With radiological suspicion of cystic lung disease, patient was posted for video assisted thoracoscopic surgery and excision of the cyst was done and sent for HPE. USG abdomen was normal. Biopsy came out as predominant fibrocollagenous tissue along with a benign cystic lesion. Biopsy for phenotype study came positive for folliculin gene 1 mutation and was diagnosed as Birt-Hogg-Dubé syndrome. Genetic counselling was given and she is on regular follow up.

CONCLUSION: BHD syndrome should be considered in patients with spontaneous pneumothorax or cystic lung disease. Concomitant skin manifestations, family history of pneumothorax, renal cancers and skin manifestations supports the suspicion of BHD syndrome. Early diagnosis is important in order to subject patients to systematic screening for renal cancers.

Disclosure of funding source(s): none

Abstract #272

Detection failure of BRAF V600E by Oncomine Dx Target Test in Lung Cancer

M. Inagaki^a (Dr)

^a *Tsuchiura Kyodo General Hospital, Tsuchiura, JAPON*

Subjects and methods: Of the 123 cases in 2019-2020, 44 cases could were inadequate, 14 cases could not be determined) were examined.

Results: All 14 undecidable cases were biopsy specimens. The size of the sample is 2*2 mm or more (6 cases), less than 1*1 mm(3 cases), and the middle(5 cases). Specimens including necrosis and crush(7 cases),specimens with conspicuous bleeding(4 cases), adenocarcinoma with preserved airspace(1 case).Of the 14 cases that could not be determined, in 8 cases in 2020, when an inquiry was made to the inspection company and an answer was obtained, PCR amplification failure was 6 cases, and read amplicon non-uniformity was 2 cases. It was considered that the cause was insufficient formalin fixation ad poor nucleic acid condition due to formalin over fixation. Regarding the lack on volume of 2*2 mm or more in the first HE, and it is possible that the sample volume was insufficient due to slicing, but it could no be verified.

Discussion: Shortening the time from the collection of biopsy specimens to the start of formalin fixation and management of the fixation start time, Class5 cytopathology LBC specimens can be stored in cell blocks and used for testing. Exchange opinions and collaborate closely with clinicians when submitting a cancer genome test. Discussion when the amount is insufficient or the judgment cannot be made. Measures such as inspection result monitoring are required

Disclosure of funding source(s): none

Abstract #273

Diagnosis of calcified endobronchial sarcoma using transbronchial cryobiopsy: Primary pulmonary spindle cell sarcoma case.

EY. Kim^a (Dr), HS. Kim^b (Pr), CY. Lee^c (Pr), SH. Yong^{*a} (Pr)

^a Division of Pulmonology and Critical Care, Department of Internal Medicine, Severance Hospital, Yonsei University College of Medicine, Seoul, CORÉE, RÉPUBLIQUE DE ; ^b Division of Medical Oncology, Yonsei Cancer Center, Yonsei University College of Medicine, Seoul, CORÉE, RÉPUBLIQUE DE ; ^c Department of Thoracic and Cardiovascular Surgery, Severance Hospital, Yonsei University College of Medicine, Seoul, CORÉE, RÉPUBLIQUE DE

Background:

Traditionally, a bronchoscopic forcep biopsy could not remove endobronchial mass with severe inner calcification (such as pulmonary sarcoma). However, cryo-biopsy can be helpful in the removal of such lesions, both safely and effectively.

Case report:

A 74-year-old Asian woman was referred to a pulmonologist for further evaluation of chronic cough with persistent wheezing. Due to her symptom, she was initially diagnosed with uncontrolled asthma and received treatment but had minimal improvement. Sequentially, chest computed tomography (CT) was performed. CT scan revealed an approximately 2.6 cm sized lobulated lesion with punctate calcifications at the distal part of the left main bronchus, which was suspected as hamartoma or aspergilloma with calcification. Fiberoptic bronchoscopy (FOB) with cryo-biopsy was planned to simultaneously remove and confirm the pathologic diagnosis. At the first FOB, a calcified endobronchial lesion causing near-total obstruction of the left main bronchus was identified. Over hours were spent removing the calcified layer using cryoprobe to maintain airway patency. However, due to severe calcification, cannulation could not be achieved in the first attempt, so a stepwise attempt was planned. Two days later, a subsequent FOB was performed. In the second procedure, more of the mass was removed, and a severely calcified inner core was observed. We planned surgical removal for cannulation. After the second approach, the final pathologic diagnosis was approved by the pathologist. Calcified endobronchial mass was primary lung synovial spindle cell sarcoma. The plan was revised, and the patient was referred to both oncologist and a thoracic surgeon for treatment of sarcoma.

Conclusion:

Pathologic confirmation and partial removal of calcified endobronchial mass were successfully performed via stepwise cryo-biopsy. Cryo-biopsy might be an alternative method to surgery in patients with a high risk of perioperative complications with optimal safety and diagnostic power.

Disclosure of funding source(s): none

Abstract #275

A rare cause of undiagnosed exudative pleural effusion, a case report

I. Arunurat^a (Dr), S. Disayabutr^{*a} (Dr), J. Tscheikuna^a (Dr)

^a *Division of Respiratory Disease and Tuberculosis, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, THAILANDE*

Background: The exudative pleural effusions have various causes with up to 20% remaining undiagnosed despite a diagnostic workup. The IgG-4-related disease is a rare fibroinflammatory disorder that can affect various organs and can be difficult to diagnose. We reported a case of IgG-4-related pleuritis without other systemic manifestations.

Case report: A 50-year-old man with a history of giant cell tumor of the left distal femur 10 years ago with no evidence of distant metastasis. In 2018, he presented with asymptomatic right pleural effusion. The pleural fluid was turbid straw color with lymphocytic predominance. Pleural LDH was 2,594 U/L, protein 9.5 g/dL, glucose <4 mg/dL, cholesterol 144 mg/dL, and triglyceride 18 mg/dL. The microbiological studies were all negative. Pleuroscopy revealed diffuse pleural thickening with yellowish plaques. The histopathology showed xanthogranulomatous pleuritis and pleural fibrosis. Computed tomography (CT) of the chest was performed later which showed consolidation and round atelectasis of the right lower lobe with loculated right pleural effusion. Transbronchial lung biopsy were done with non-diagnostic results. There was no specific treatment and the cause of pleuritis cannot be identified. The patient had no respiratory symptoms with stable minimal right pleural effusion during a 2-year follow-up. Two years later, he developed a new left pleural effusion without systemic symptoms. CT chest revealed no change of loculated right pleural effusion and round atelectasis of the right lower lobe. The profile of the left pleural fluid and pleuroscopic findings were similar to the previous examination on the right side. The histopathological results showed dense infiltration by plasma cells with eosinophils and multifocal fibrotic changes. The immunostaining was compatible with IgG-4-related disease.

Conclusion: The exudative pleural effusion with lymphocytic predominance with high levels of LDH and protein and low glucose without other explainable cause, the IgG-4-related disease should be considered as a differential diagnosis.

Disclosure of funding source(s): none

Abstract #277

Two cases of patients with thoracic SMARCA4-deficient undifferentiated tumors with severe airway stenosis who underwent airway stenting

Y. Shinohara^{*a} (Dr), Y. Ishii^a (Dr), A. Iwakoshi^a (Dr), M. Oki^a (Dr)

^a National Hospital Organization Nagoya Medical Center, Nagoya, JAPON

Background: Thoracic SMARCA4-deficient undifferentiated tumors (SMARCA4-UT) are a rare and relatively new disease that was first reported in 2015. These tumors frequently occur in the mediastinum and pulmonary hilum, and there is no established treatment. The tumors progresses quickly, and patients often have a poor prognosis.

Case report: Case 1: A 58-year-old man who had dyspnea for two months prior to admission and underwent emergency transport to the previous hospital for exacerbated dyspnea. He was transferred to our hospital for bronchoscopic treatment of a mediastinal tumor that was found to cause an airway stricture by CT scan. On the same day, he underwent airway stenting using a rigid bronchoscope under general anesthesia, and the dyspnea disappeared. On day four, a biopsy was taken from the esophagus, and the patient was diagnosed with a SMARCA4-UT. He received best supportive care because his performance status score was 3; however, he died because due to rapid disease progression on day 22. Case 2: A 64-year-old male who was admitted to his previous hospital for close examination of a mediastinal tumor. He was transferred to our hospital for bronchoscopic treatment, because he had extensive tracheal stenosis, from the trachea to both main bronchi, and dyspnea on exertion. On day two, he underwent airway stenting using a rigid bronchoscope under general anesthesia, and the dyspnea disappeared. He was diagnosed with a SMARCA4-UT by intraoperative biopsy, and radical radiation therapy initiated on day 18. The radiation therapy resulted in tumor shrinkage and an improvement of his performance status score.

Conclusion: We present two cases of patients with SMARCA4-UT with severe airway stenosis that required airway stenting. SMARCA4-UT frequently occur in the mediastinum and pulmonary hilum, and severe airway stenosis can be fatal. However, stenting may enable subsequent treatment.

Disclosure of funding source(s): none

Abstract #278

Flexible bronchoscopic balloon dilation following microlaryngoscopy guided-radiofrequency ablation guided as post tracheostomy tracheal stenosis treatment: A rare case report

L. Madison^{*a} (Dr), D. Soehardiman^a (Dr), Y. Djamil^b (Dr)

^a Department of Pulmonology and Respiratory Medicine, Faculty of Medicine Universitas Indonesia - Persahabatan General Hospital, Jakarta, INDONESIA ; ^b Department of Otorhinolaryngology, Head and Neck Surgery - Persahabatan General Hospital, Jakarta, INDONESIA

Background: Both post tracheostomy (PT) and post intubation (PI) are tracheal stenosis risk factors. The most common sites are tracheal wall which has in contact by endotracheal tube cuff and tracheal stoma site at post tracheostomy state. The reported incidence of PI and PT tracheal stenosis range is 10-22% but only 1-2% of the patients are symptomatic or have severe stenosis. In tracheal stenosis, microlaryngoscopy-guided radiofrequency ablation (RFA) success rate is 89%, while flexible bronchoscopic balloon dilation success rate is 85-95%. Those combinations are hopefully increase an outcome improvement. **Case Report:** A man, 54 years old, had a hoarseness worsening to voice loss as a chief complaint. Patient has been inserted tracheostomy for 4 months with previous prolonged intubation history. Cervical computerized tomography (CT) performed a lumen narrowing as high as C5-C7 level. Patient had advised for cryotherapy with bronchoscopy-guided procedure but he had chosen second opinion and admitted to Persahabatan General Hospital. Interventional pulmonology and otorhinolaryngology joining procedures were designed in intraoperative setting and they had divided to four steps. The first was early flexible bronchoscopy capturing a pinpoint subglottic stenosis with 2 mm in diameter. The second was a trial of guide wire insertion and balloon dilator, but only guide wire can be inserted through stenosis. The third was RFA following microlaryngoscopy for optimal dilation. Last, balloon dilator had immediately inserted with 8-10 mm dilation so the lumen was opened and scope could be inserted until tracheostomy balloon was visible. The patient could be discharged from hospital in two days postoperative treatment. The plan is postoperative bronchoscopy so tracheostomy closing can be considered. **Conclusion:** Bronchoscopic balloon dilation following microlaryngoscopy-guided RFA is safe procedure due to minimal invasive and they can be recommended as definitive treatment for tracheal stenosis.

Disclosure of funding source(s): none

Abstract #279

Cryobiopsy: finding the way with real-time c-arm based tomography navigation

AJ. De Grauw^{*a} (Dr), S. Martinello^a (Dr), F. Sultani^a (Dr), C. Ghirotti^a (Dr), A. Ambrosini Spaltro^a (Dr), C. Ravaglia^a (Dr), V. Poletti^a (Pr)

^a *Ospedale Morgagni-Pierantoni (Forlì), Forlì, ITALIE*

The boundaries of interventional pulmonology are continuously expanding to keep innovating diagnostic procedures in a safe and cost-effective way. We report our preliminary use of a novel real-time endoscopic navigation technique that correlates computed tomography (CT-scan) images with conventional C-arm based tomography (CABT), allowing to confirm that a target lesion has been reached and to optimize the correlation between histology and radiological patterns, the latter possibly being of great advantage in the diagnosis of diffuse interstitial lung disease (D-ILD).

We used BodyVision® C-arm based tomography (CABT) technology. A CT-scan is loaded into the system beforehand, and the target area is selected on these images. During the procedure, the software merges the spatial information of the CT-scan with multi-plane x-ray images acquired with a conventional C-Arm to intraoperatively show the exact location of the target area and thus effectively navigating the biopsy procedure. We tested this technology in six different cryobiopsy procedures, with 1.1 mm or 1.7 mm cryoprobe, freezing time 8-11 seconds, patients aged 52-74 years, four males and two females. We sampled one solid nodule, two ground-glass (GG) nodules, a suspected bronchiolitis and two D-ILDs, one with patchy GG opacities and one with a reticular pattern. None of the nodules had bronchus sign and all were <1 cm in size. We obtained a definite diagnosis in three cases: smoke related interstitial lung-disease with organizing pneumonia in the patchy GG opacities, mucinous adenocarcinoma in a GG nodule, sarcoidosis in the reticular ILD.

This kind of navigation is feasible and cost-effective, as it applies a modern software to CABT, already largely available, and does not require significant additional personnel or training. Using this technique, we hope to significantly improve sampling accuracy and to achieve precise correlation between histology and radiological patterns in diffuse interstitial lung disease.

Disclosure of funding source(s): none

Abstract #280

Pleural aspergillosis as a rare presentation of fungal infection: a case report.

PD. Azika^a (Mme), GA. Desianti^a (Mme), RE. Sembiring^b (Mme)

^a Department of Pulmonology and Respiratory Medicine Universitas Indonesia, Faculty of Medicine Universitas Indonesia, Persahabatan National Respiratory Referral Hospital, Jakarta, INDONESIA ; ^b Department of Anatomical Pathology, Persahabatan National Respiratory Referral Hospital, Jakarta, INDONESIA

Background: Pleural aspergillosis is an uncommon manifestation of aspergillosis, that present in less than 5% of pleural effusion cases. Active or previous tuberculosis, bronchopleural fistulae, pleural drainage and lung resection are considered as the main predisposing conditions for *Aspergillus* infection in the pleural space. Pleural thickening has been described as an early manifestation of pulmonary aspergillosis. The diagnosis of pleural aspergillosis is confirmed by demonstration of the organism in pleural fluid or biopsy. However, this case has a high risk of mortality, mostly due to late or missed diagnosis or lack of effective treatment.

Case report: A 52-years-old male with the history of haemochromatosis with deferasirox for three years and previously treated as clinical lung tuberculosis (TB) for one year, came with chronic cough, dyspnoea and weight loss. Sputum acid-fast bacilli and potassium hydroxide smear were negative. High Resolution CT Thorax showed pleural effusion with multiple pleural calcification and thickening on lower hemithorax. Serial CT showed new multiple nodular lesion in the right pleura. Traction bronchiectasis, centrilobular, paraseptal emphysema, and bilateral lung honeycombing consistent with previous TB history. The patient was suspected as mesothelioma. Bronchoscopy showed hyperaemic and oedema of mucous membrane on right upper lobe. Pathological anatomy result from bronchial washing showed no malignancy. He underwent Trans Thoracic Needle Aspiration (TTNA) US-guided and cytological result showed necrotic debris, connective tissue fibers, and rod-shaped material *Aspergillus* fungi that consistent with aspergillosis.

Conclusion: Pleural aspergillosis is a rare manifestations of aspergillus infection. *Aspergillus spp.* infection should be considered in the differential diagnosis of such cases, particularly for those with a chronic lung disease.

Keyword: *pleural aspergillosis, chronic lung disease*

Disclosure of funding source(s): none

Abstract #281

Case Report: Macroglossia, a sign of A.L. amyloidosis in a case of recurrent pleural effusion

P. Torres^{*a} (Dr), E. Faustino^a (Dr)

^a Mary Mediatrix Medical Center, Lipa, PHILIPPINES

Background Amyloidosis is a rare disease in which aggregation and deposition of misfolded proteins results in insoluble amyloid fibrils derived from different precursor proteins and commonly presented with macroglossia and confirmed by biopsy with apple-green birefringence.

Case Report A 52-year-old woman presented with a chief complaint of difficulty breathing and a history of recurrent bilateral pleural effusion; on admission, a progressively enlarging tongue was also noted in the history since 2017. The patient underwent a tongue and lung tissue biopsy, which revealed apple-green birefringence in Congo red stain. The patient expired due to multiple organ failures.

Conclusion Amyloidosis is a rare case with multiple clinical presentations confirmed by biopsy. In summary, although amyloidosis is commonly presented with macroglossia, it is essential to investigate further multi-organ involvement that can lead to poor clinical outcomes.

Bibliography

Shahbaz A, Aziz K, Umair M, Malik ZR, Awan SI, Sachmechi I. Amyloidosis Presenting with Macroglossia. *Cureus*. 2018 Aug 22;10(8):e3185. DOI: 10.7759/cureus.3185. PMID: 30364871; PMCID: PMC6199138.

Liakou,C.Et al (2016). A Tongue Lesion as a Sign of a Systemic Disease. *Case reports in medicine*, 2016, 6723575. <https://doi.org/10.1155/2016/6723575>

Dai, Yong MD; Liu, Chaoling MD; Chen, Jiaping MD; Zeng, Qigang MD; Duan, Chenxia MD Pleural amyloidosis with recurrent pleural effusion and pulmonary embolism, *Medicine*: January 2019 - Volume 98 - Issue 3 - p e14151 DOI: 10.1097/MD.00000000000014151

Bowen, K., Shah, N., & Lewin, M. (2012). Al-amyloidosis presenting with negative Congo red staining in the setting of high clinical suspicion: A case report. *Case Reports in Nephrology*, 2012, 1-4. <https://doi.org/10.1155/2012/593460>

Gertz, M. A., & Dispenzieri, A. (2020). Systemic amyloidosis recognition, prognosis, and therapy. *JAMA*, 324(1), 79. <https://doi.org/10.1001/jama.2020.549>

Dispenzieri, A. (n.d.). Treatment and prognosis of immunoglobulin light chain (AL) amyloidosis and light and heavy chain deposition diseases. *UpToDate*. Retrieved June 26, 2022, from <https://www.uptodate.com/contents/treatment-and-prognosis-of-immunoglobulin-light-chain-al-amyloidosis-and-light-and-heavy-chain-deposition-diseases>

Disclosure of funding source(s): none

Abstract #282

Radial probe endobronchial ultrasound-guided transbronchial lung cryobiopsy using 1.1 mm flexible cryoprobe for peripheral lesions.

D. Park^{*a} (Pr)

^a Chungnam National University Hospital, Daejeon, CORÉE, RÉPUBLIQUE DE

Background: Cryobiopsy is known to improve the diagnostic yield of peripheral lung lesions (PPL) (1). It has also been reported that cryobiopsy using a guide sheath (GS) is significantly associated with increased diagnostic yield during radial probe endobronchial ultrasound (R-EBUS)-guided transbronchial lung cryobiopsy (TBLC) (2). We aimed to investigate whether the use of 1.1 mm flexible cryoprobe and GS improves the diagnostic accuracy for PPL.

Methods: Data from patients who underwent R-EBUS-guided TBLC at Chungnam National University Hospital from August 2021 to April 2022 were retrospectively analyzed.

Results: A total of 210 lesions were analyzed. The diagnostic yields of forceps biopsy and cryobiopsy were 57.3% and 79.2%, respectively, and the total diagnostic yield was 85.3% ($p < 0.001$). The diagnostic yields of forceps biopsy and cryobiopsy for malignant lesions were 62.4% and 94.6%, respectively ($p < 0.001$). Bleeding occurred in 62 patients (35.1%), and among them, there were 13 (10.6%) clinically significant bleeding (moderate bleeding or severe) cases. There were no severe or life-threatening bleedings.

Conclusions: R-EBUS-guided TBLC using 1.1 mm flexible cryoprobe and GS improves the diagnostic accuracy for PPL.

References

1. Kho SS, Chan SK, Yong MC, Tie ST. Performance of transbronchial cryobiopsy in eccentrically and adjacently orientated radial endobronchial ultrasound lesions. *ERJ Open Res.* 2019 Oct 21;5(4):00135-2019.
2. Nasu S, Okamoto N, Suzuki H, Shiroyama T, Tanaka A, Samejima Y, Kanai T, Noda Y, Morita S, Morishita N, Ueda K, Kawahara K, Hirashima T. Comparison of the Utilities of Cryobiopsy and Forceps Biopsy for Peripheral Lung Cancer. *Anticancer Res.* 2019 Oct;39(10):5683-5688.

Disclosure of funding source(s): none

Abstract #283

Pulmonary artery pseudoaneurysm- A rare vascular catastrophe in pulmonary mucormycosis in a post covid patient .

Y. Sivagnaname^{*a} (Dr), P. Radhakrishnan^a (Dr), A. Maria Selvam^a (Dr)

^a *Sri Manakula vinayagar Medical college and hospital, Puducherry, INDE*

Background:

Pulmonary artery pseudo aneurysm(PAP) in Pulmonary mucormycosis is a rare clinical entity sparsely reported in literature. Moreover PAP presenting as **Endobronchial mass with hemoptysis is a real eye opener** for clinicians to consider as differential diagnosis and to avoid bronchoscopic biopsies when they see a mass in diagnostic bronchoscopy. We encountered 3 similar cases which was diagnosed early and managed well because of our initial experience .

Case Report:

48 year old female came to our hospital with chief complaints of cough with blood tinged sputum for 1 month and breathlessness for 1 month. Patient had severe covid pneumonia 1 month back admitted in a covid care hospital and was discharged. She is a known case of systemic Hypertension and Diabetes under treatment for 5 years. Complete blood count showed neutrophilic leucocytosis with uncontrolled Diabetes mellitus (Fasting blood sugar 280mg/dl and Post prandial sugar 430mg/dl). Chest Radiograph and Non contrast computed tomography were suggestive of Right lower lobe consolidation. Sputum for Acid fast bacilli, Gram stain , fungal direct smears/cultures were unyielding . Patient was then posted for diagnostic bronchoscopy which showed smooth globular mass arising from the bronchial wall completely occluding anterior and lateral basal segments, bleeds on coughing. Bronchoalveolar lavage smear and culture confirmed the diagnosis of mucor. In view of bronchoscopic findings , CT pulmonary angiography was performed which showed pseudoaneurysm involving right descending pulmonary artery and posterior basal segmental artery.

Finally patient was diagnosed to have pulmonary mucormycosis with pulmonary artery pseudoaneurysm presented as endobronchial mass with hemoptysis. Patient was started on liposomal amphotericin along with other supportive measures and later referred to thoracic surgeon for surgical resection(Lobectomy).

Conclusion :

Pulmonary artery pseudoaneurysm in Pulmonary mucormycosis is a rare clinical entity with limited description in literature High clinical suspicion, early diagnosis and timely intervention can prevent morbidity and mortality.

Disclosure of funding source(s): none

Abstract #284

Determinants of pleurodesis success - does pleural fluid biochemical features matter?

S. Silva^{*a} (Dr), J. Eusébio^a (Dr), M. Santos^a (Dr), V. Martins^a (Dr), M. Aguiar^a (Dr), F. Todo Bom^a (Dr)

^a *Interventional Pulmonology Unit, Pulmonology Department, Hospital Beatriz Ângelo, Loures, PORTUGAL*

Background

Recurrent pleural effusion (PE) causes a significant morbidity with dyspnea and impairment in quality of life. In many patients, PE recurs despite the best possible treatment of the underlying condition and an effective palliative approach is required.

Methods

Retrospective analysis of all pleurodesis in a Pulmonology Unit of a secondary hospital, between 2012 and 2021.

All pleurodesis were performed in an inpatient setting using talc slurry via chest tube (CT). We collected demographic data, biochemical and cytological analysis of pleural fluid (PF), etiology, CT size and duration, efficacy, presence of congestive heart failure, nonsteroidal anti-inflammatory and corticosteroids medication and procedure complications. Efficacy was defined as non-recurrence of PE that required new pleural intervention.

Data were analyzed in IBM SPSS Statistics® version 22.

Results

A total of 109 patients were enrolled. 52.3% were female and mean age was 71.9 ± 12 years old. Light's criteria identified 92.7% as exudates. 6.4% were recurrent non-malignant PE, caused by heart failure or cirrhosis. None of these patients recurred after pleurodesis.

93.6% were malignant PE, although only 75.5% had positive cytology. Among malignant PE, 52% were caused by lung cancer and 11.8% by breast cancer. 20.2% recurred after pleurodesis.

We registered 12.8% complications, the most frequent was fever (4.6%).

Pleurodesis efficacy was higher when LDH in PF was <1000 UI/L (p-value 0.013) and when CT ≥ 20 Fr were used (p-value 0.035). Recurrence is more likely the longer CT is maintained (p-value 0.039).

Conclusion

Pleurodesis is a safe and efficient procedure. Our results show that LDH >1000 UI/L as well as the longer need of CT drainage might be predictors of recurrence, which may alert us that these patients may need an alternative treatment, eventually chronic CT. Results favor the use of larger bore CT. Prospective studies are needed.

Disclosure of funding source(s): none

Abstract #285

Endobronchial ultrasound-guided cryobiopsy: a new frontier?

AJ. De Grauw^{*a} (Dr), F. Sultani^a (Dr), S. Martinello^a (Dr), C. Ghirotti^a (Dr), V. Poletti^a (Pr), C. Ravaglia^a (Dr)

^a *Ospedale Morgagni-Pierantoni (Forlì), Forlì, ITALIE*

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive and safe technique, widely practiced and included in guidelines as one of the preferred strategies to stage non-small cell lung cancer (NSCLC). It is also used for the diagnosis of other diseases, such as other intrathoracic cancers, sarcoidosis and lymphomas. A limitation of this technique is sample size, which can render further, often more invasive, testing necessary. Recently, a new approach has been suggested: EBUS-guided cryobiopsy. We present a case series of 10 patients who underwent sampling through EBUS-guided cryobiopsy in our unit.

The age of the subjects ranged from 37 to 74 (average 56 years), six males and four females. The procedures were performed in general anaesthesia with intubation, as is standard procedure in our unit for EBUS-TBNA. We used a 19G needle to perform EBUS-TBNA, followed by cryobiopsies with a 1.1 mm cryoprobe through the opening created with the needle (avoiding use of needle-knife as reported elsewhere), freezing time 3-4 seconds. There were no procedure-related complications. In eight cases lymph nodes were sampled, while in the remaining two cases a peri-bronchial mass was sampled. The procedures were all diagnostic: NSCLC in four cases, sarcoidosis in three cases, one Hodgkin lymphoma, one amartoma and one benign lymph node hyperplasia. Diagnosis was always concordant between EBUS-TBNA and EBUS-cryobiopsy, with the larger sample size of the cryobiopsies posing a definite advantage in one case of NSCLC, as EBUS-TBNA samples were not sufficient for complete mutational and molecular testing, and in the case of Hodgkin lymphoma, as it allowed precise immunophenotyping.

This case-series further supports the promising new literature available, suggesting that EBUS cryobiopsies are feasible, safe and a possible new frontier in the sampling not only of mediastinal lymph nodes, but also of other lesions identifiable with EBUS.

Disclosure of funding source(s): none

Abstract #286

Diagnostic yield of Endobronchial ultrasound guided transbronchial needle aspiration (EBUS-TBNA) in mediastinal pathology.

D. Terfani^{*a} (Pr), F. Khalouf^a (Dr)

^a *medicine faculty, Oran, ALGÉRIE*

Background: Endobronchial ultrasound guided transbronchial needle aspiration (EBUS-TBNA) is a minimally invasive procedure with a high diagnostic yield for mediastinal and central pulmonary lesions. This procedure is especially useful for lung cancer diagnosis, staging and also for the diagnosis of benign pathologies.

Methods: From January 2018 to May 2022, we included 105 patients with a mediastinal or mediastinal-pulmonary mass requiring EBUS TBNA. This is a retrospective study which took place in the Functional Respiratory Exploration and Interventional Endoscopy department of EHU Oran Algeria. The aim is to determine the contribution of EBUS TBNA in the diagnosis of mediastinal-pulmonary pathologies. All patients had a chest CT scan, 4 only a PET CT scan.

Results: 99/105 patients benefited from an EBUS TBNA with awake sedation and only 4 patients with ROSE. 50 women versus 49 men with *sex ratio* = 1, average age was 52 with extremes (16-82). The Results were distributed according to the positivity of the samples as follows: 72 conclusive results (72%) including: 15 bronchial cancers, (21%), with 1/15 operable. 2 Lymph node metastases from bronchial cancer (staging), (3%). 6 Lymph node metastases from extra-thoracic cancer (8%). 3 Lymphoma (4%). The absence of lymph node infiltration in a current or in remission neoplastic context was noted in 8 patients (11%). 25 sarcoidosis (34%). 10 Tuberculosis (14%). 4 Unspecified granuloma (5%). No complications were noted during the procedure.

Conclusions: The EBUS TBNA is an innovative technique in Algeria, reproducible less invasive than other procedures allowing an important contribution in the diagnosis of mediastinal pathologies requiring pulmonologists and trained anatomopathologists.

Disclosure of funding source(s): none

Abstract #287

Transbronchial mediastinal cryobiopsy in the diagnosis of mediastinal lymph nodes

J. Cascón Hernández^a (Dr), M. Ariza Prota^a (Dr), F. López González^a (Dr), L. García Alfonso^a (Dr), M. Gil Muñiz^b (Mme), I. Sánchez Fernández^b (Mme), á. Lanza Martínez^c (Dr), C. De La Escosura Muñoz^c (Dr), L. Abad Chamorro^c (Dr), A. Fernández Fernández^c (Dr), LM. Fernández Fernández^d (Dr), H. Torres Rivas^d (Dr), M. García Clemente^c (Dr)

^a Interventional Pulmonology Unit. Pulmonology Department. Hospital Universitario Central de Asturias, Oviedo, ESPAGNE ;

^b Nurse. Interventional Pulmonology Unit. Hospital Universitario Central de Asturias, Oviedo, ESPAGNE ; ^c Pulmonology Department. Hospital Universitario Central de Asturias, Oviedo, ESPAGNE ; ^d Pathology Department. Hospital Universitario Central de Asturias, Oviedo, ESPAGNE

BACKGROUND

Linear echobronchoscopy-guided transbronchial needle aspiration (EBUS-TBNA) has a high diagnostic yield in the diagnosis and staging of lung cancer. However, it is not as high in other diseases involving mediastinal lymphadenopathy, such as lymphoproliferative syndromes or granulomatous diseases. Mediastinal cryobiopsy could help to improve this performance.

METHODS

- A prospective study was conducted.
- From march to June 2022, we consecutively included all patients who underwent linear echobronchoscopy-guided transbronchial mediastinal cryobiopsy (EBUS-TMC).
- Once EBUS-TBNA was performed, a 1.1 mm cryoprobe (Erbe) was introduced into the lymph node (LN) to perform EBUS-TMC.
- Data collected: Anthropometric data, size and location of LN, size and results of samples, diagnosis, complications.
- Results are expressed as mean (and range), relative frequencies.

RESULTS

- A total of 32 LN in 26 patients were included. 65% of them were male with an age of 62.6 (34-85) years.
- EBUS-TMC samples were representative in 94%. In 3 of them (9%) added relevant information not provided by EBUS-TBNA: determined the histologic subtype (2 cases) or was the only positive sample (1).
- The biopsied LN measured 23.8 (10-48) mm by EBUS and were located in the following regions: 7 in 47% (15/32), 11L in 25% (8/32), 11Ri in 6% (2/32), 4L in 6% (2/32), 4R in 6% (2/32), 2R in 3% (1/32), 3p in 3% (1/32) and right lower lobe in 3% (1/32).
- Cryobiopsy samples measured 0.4 (0.1-0.7) cm.
- The list of definitive diagnoses included: adenocarcinoma in 27% (7/26), sarcoidosis in 19% (5/26), squamous cell carcinoma in 15% (4/26), small cell carcinoma in 12% (3/26), Negative-Anthracosis in 12% (3/26), follicular B lymphoma in 8% (2/26), NSCLC in 4% (1/26), Breast cancer metastasis in 4% (1/26).
- There were no complications.

CONCLUSIONS

1. EBUS-TMC is a safe technique that can be performed in all EBUS regions.
2. Mediastinal cryobiopsy provides relevant information that complements EBUS-TBNA.

Disclosure of funding source(s): none

Abstract #288

Bronchoscopy in the intensive care unit: when interventional pulmonology helps

C. Da Silva Alves^{*a} (Dr), L. Maia Morais^b (Dr), M. Alves^c (Dr), M. Ferrão Silveira^a (Dr), L. Santos^a (Dr), R. Costa^a (Dr), J. Boléo-Tomé^a (Dr), F. Rodrigues^a (Dr)

^a Pulmonology Department, Hospital Professor Doutor Fernando da Fonseca, Amadora, PORTUGAL ; ^b Intensive Care Unit, Centro Hospitalar Lisboa Ocidental, Lisboa, PORTUGAL ; ^c Pulmonology Department, Centro Hospitalar Lisboa Ocidental, Lisboa, PORTUGAL

Background: In some European countries like Portugal, Pulmonology and Intensive Care Medicine (IMC) are two different specialties. Intensivists have now training in flexible bronchoscopy, mainly with diagnostic purposes, occasionally referring more complex cases to Pulmonology.

Methods: Descriptive analysis of all bronchoscopy exams performed under mechanical ventilation by an interventional pulmonology team in an Intensive Care Unit (ICU). Medical records from January 2015 to December of 2021 were retrospectively reviewed (first 6 years since intensive care medicine is a recognized specialty in Portugal).

Results: Seventy endoscopic exams were reviewed, 61 (87%) flexible bronchoscopies (FB) and 9 (15%) rigid bronchoscopies (RB). There was a median of 10 exams performed per year, with a decrease during the covid-19 pandemic (3 in 2020 and 8 in 2021). Patients were mainly female (68%) with mean age of 62 ± 18 years. The main indications for FB were hemoptysis (n=16, 26%), suspected lung infection (n=10, 16%), diagnosis or staging of lung cancer (n=9, in which 3 were with radial EBUS) and lung atelectasis (n=9, 15%). Aspiration of bronchial secretions (n=57, 93%), bronchoalveolar lavage (n=23, 38%), bronchial *toilette* (n=10, 16%) and bronchial biopsy (n=8, 13%) were the most frequent techniques performed.

The indications for RB were hemoptysis (n=3, 33%), revision of tracheal (n=1, 11%) and bronchial (n=1, 11%) stent and benign tracheal stenosis (n=4, 44%), the latter following previous diagnostic FB performed due to stridor and leading to the placement of tracheal stents in all.

Conclusion: Although bronchoscopy training has been recently included in ICM programs, a negative trend in the number of endoscopic exams performed by pulmonology in ICU was not noted. Complex diagnostic and therapeutic cases need to be referred to a dedicated bronchology team.

Disclosure of funding source(s): none

Abstract #289

The effects and outcomes of regional block anesthesia in non-intubated thoracoscopy

M. Ueoka^a (Dr), R. Garcia Tome^a (Dr), N. Naim^b (Dr), R. Movahedi^b (Dr), P. Chia^b (Dr), S. Oh^a (Dr), C. Oberg^a (Dr), T. He^a (Dr), I. Susanto^a (Dr), R. Ronaghi^a (Dr)

^a University of California, Los Angeles, Department of Pulmonary and Critical Care, Los Angeles, ÉTATS-UNIS ; ^b University of California, Los Angeles, Department of Anesthesiology, Los Angeles, ÉTATS-UNIS

Background:

Video assisted thoracic surgery (VATS) and thoracoscopy can both treat a variety of pleural diseases. VATS generally requires general anesthesia, and mortality has been reported to be as high as 21.7% in non-elective cases. Thoracoscopy can be performed under moderate sedation without intubation. We aimed to look at the effects of regional anesthesia in thoracoscopy.

Methods:

Patients who received pre-operative regional anesthesia with thoracic epidural infusions from May-June 2022 were evaluated. Patients who declined regional anesthesia during the same time period were reviewed for comparison. All patients underwent thoracoscopy; the amount and types of sedation and analgesia intra- and post-operatively were reviewed. Data was collected and analyzed using SPSS analytical software.

Results:

A total of 24 patients were reviewed (n=24). All patients underwent thoracoscopy for various pleural diseases; 12 patients received regional anesthesia and 12 did not. Intra-op lidocaine requirements were significantly lower in the regional anesthesia group, 20.5 vs. 27.4 mg (p=0.03). Intra-op propofol and fentanyl requirements were also significantly lower, 91.2 ± 18.2 vs. 185.2 ± 22.1 mg (p=0.0002) and 42.3 ± 12.3 vs. 95.4 ± 14.2 mcg, (p= 0.003), respectively. Midazolam use was similar in both groups. The need for vasopressor support with phenylephrine was also significantly lower in the regional anesthesia group, 101.4 ± 22.2 vs. 134.5 ± 56.2 mcg, (p=0.02). Post-operatively, oxycodone use was also significantly lower, 20.5 ± 7.3 vs. 26.3 ± 5.2 mg, (p=0.0001).

Conclusion:

We present one of the largest data sets investigating regional anesthesia in thoracoscopy. Our data shows significantly less need for sedation and anesthesia intra-op in those who received regional anesthesia, as well as decreased post-operative pain medication requirement. Thoracoscopy offers a potentially safer alternative to VATS given reduced sedation and analgesic needs and may be particularly helpful in patients who may not be fit for general anesthesia.

Disclosure of funding source(s): none

Abstract #290

Pneumomediastinum and pneumoperitoneum after endobronchial laser therapy and debulking in leiomyosarcoma lung metastasis

C. Da Silva Alves^{*a} (Dr), A. Fabiano^a (Dr), M. Alves^b (Dr), L. Maia Morais^c (Dr), M. Ferrão Silveira^a (Dr), L. Santos^a (Dr), R. Costa^a (Dr), J. Boléo-Tomé^a (Dr)

^a Pulmonology Department, Hospital Professor Doutor Fernando da Fonseca, Amadora, PORTUGAL ; ^b Pulmonology Department, Centro Hospitalar Lisboa Ocidental, Lisboa, PORTUGAL ; ^c Intensive Care Unit, Centro Hospitalar Lisboa Ocidental, Lisboa, PORTUGAL

Background: Rigid bronchoscopy is mainly used for central airway obstruction, and pneumomediastinum and pneumoperitoneum are rare complications. Leiomyosarcoma is a rare solid neoplastic malignancy characterized by aggressive behavior, occasionally metastasizing to the lung.

Case Report: A 41-year-old woman presented to the emergency room with hemoptoic cough and a history of progressive weight loss within the previous two months. Chest radiography showed multiple large “cannon ball” pulmonary nodules, confirmed by chest CT, with one mass invading the main left bronchus. The patient underwent a rigid bronchoscopy, revealing a necrotic neoplastic growth occluding the main left bronchus (90% stenosis). Mechanical debulking followed by Laser Nd:YAG photocoagulation were performed, showing occlusion of left upper lobe bronchus and permeability of lower lobe segments. In the recovery room, after coughing, the patient developed sudden subcutaneous emphysema in the neck and face. A chest x-ray showed a left pneumomediastinum. Subcutaneous needles were inserted, with clinical improvement of the emphysema. Chest-Abdomen CT revealed a large, bilateral pneumomediastinum and pneumothorax, pneumoperitoneum, retroperitoneum, a mass in the right kidney and multiple uterine nodules. The patient was managed conservatively and improved.

Biopsy of the lung mass revealed leiomyosarcoma of unknown origin. Three weeks later, rigid bronchoscopy was repeated due to left atelectasis, showing new neoplastic growth occluding the main left bronchus and right B6 segment. Mechanical debulking was performed of both lesions and a Dumon stent was placed in the left main bronchus. Biopsy of the mass of the right kidney confirmed renal leiomyosarcoma stage IV.

Conclusion: We report these rare complications following bronchoscopy and rapid progression of leiomyosarcoma lung metastasis. Although no laceration was detected during the procedure, pneumomediastinum and pneumothorax are possible, and the air can spread to the abdominal cavity through small pleuroperitoneal anatomic defects, resulting in pneumoperitoneum and retroperitoneum.

Disclosure of funding source(s): none

Abstract #291

Endobronchial tuberculosis in paediatric population - a bronchoscopy tale of 15 years

C. Da Silva Alves^{*a} (Dr), M. Alves^b (Dr), L. Maia Morais^c (Dr), M. Ferrão Silveira^a (Dr), L. Santos^a (Dr), R. Costa^a (Dr), J. Boléo-Tomé^a (Dr)

^a Pulmonology Department, Hospital Professor Doutor Fernando da Fonseca, Amadora, PORTUGAL ; ^b Pulmonology Department, Centro Hospitalar Lisboa Ocidental, Lisboa, PORTUGAL ; ^c Intensive Care Unit, Centro Hospitalar Lisboa Ocidental, Lisboa, PORTUGAL

Background: Pulmonary Tuberculosis (TB) in the paediatric population is characterized by enlarged mediastinal lymph nodes which compress and infiltrate the airways resulting in endobronchial tuberculosis (EBTB). There is still modest data regarding children EBTB.

Methods: Medical records of patients under 18 years with a suspected or confirmed *Mycobacteria tuberculosis* lung infection, between January 2006 to May of 2022, were retrospectively reviewed. Bronchoscopy findings were classified according to Chung classification for tuberculous lesions in adults (actively caseating, fibrostenotic, edematous-hyperemic, tumorous, ulcerative, granular, and nonspecific bronchitic).

Results: Seventy-three bronchoscopy exams performed due to pulmonary TB were reviewed, and 34 (47%) with EBTB were included in the study. This included 27 (79%) flexible bronchoscopies and 7 (21%) rigid bronchoscopies. Suspected tuberculosis (65%, n=22) was the main indication for bronchoscopy, followed by unfavorable clinical/radiologic progression (35%, n=12). Median age at diagnosis was 7 (IQR 3.8-14.2) and patients were predominantly male (59%, n=20). Bronchoscopy findings were: mucosal edematous-hyperemic (65%, n=22), granular (35%, n=12), fibrostenosis (12%, n=4), tumorous (3%, n=1) and ulcerative (3%, n=1). Extrinsic compression was found in 24% (n=8) of the exams; 2 cases had significant bronchial stenosis and underwent balloon dilatation with lumen restoration. Six (18%) patients had endobronchial granulomas. From these, 3 had significant stenosis and were removed through laser photocoagulation followed by balloon dilatation with good results.

Conclusion: EBTB was present in almost half of the bronchoscopies for TB investigation, being edematous-hyperemic mucosa the most common manifestation. Bronchial and segmental stenosis was a common complication of EBTB and effective lumen restoration was possible with balloon dilatation. The variability of bronchoscopic findings urges for a valid classification for the pediatric population.

Disclosure of funding source(s): none

Abstract #292

An unusual presentation of Wegener's granulomatosis with Splenic infarct

P. Radhakrishnan^{*a} (Dr), Y. Sivagnaname^a (Pr), A. Selvam^a (Dr)

^a Sri Manakula Vinayagar Medical College and Hospital, Puducherry, INDE

Background:

Granulomatosis with polyangiitis (GPA) or Wegener's granulomatosis is a necrotizing vasculitides predominantly affecting small-sized arteries. It is a rare long term systemic disorder that affects most commonly the upper and lower respiratory tract and the kidneys.

Case Report:

A 21-year-old male, driver by occupation presented with complaints of breathlessness, cough with blood stained sputum and high-grade fever for 15 days. He is non-smoker and non-alcoholic with no comorbidities. His vitals were stable with oxygen saturation of 95% @ room air. Routine blood investigation showed neutrophilic leukocytosis and thrombocytosis. Blood culture showed non-fermenting gram negative bacilli and was started on antibiotics as per the sensitivity along with supportive measures. Chest radiography showed left upper zone mass. Computed Tomography thorax showed bilateral multiple nodular masses and few of them showing cavities with diffuse ground glass opacities. Patient complained of abdominal pain on fifth day of admission. Initially he was evaluated with bedside Ultrasonogram which showed heterogenous spleen with perisplenic collection. Later, contrast enhanced CT abdomen was done which showed non-enhancing spleen suggestive of splenic infarct. Echocardiography was suggestive of minimal pericardial effusion. Otolaryngology and ophthalmologic evaluation were normal. Diagnostic bronchoscopy showed pale, unhealthy mucosa with right and left upper lobe bronchus narrowing. BAL Cytology showed neutrophilic predominance. BAL AFB, culture and CBNAAT were negative. Endobronchial biopsy was suggestive of granulomatous inflammation. With suspicion of GPA, ANCA profile was sent. C -ANCA was strongly positive (345.01 RU/mL). ANA was negative. Patient was started on methylprednisolone pulse therapy along with Rituximab. Patient improved symptomatically with significant radiological resolution and is on follow up.

Conclusion:

GPA is a systemic disease that can lead to multiorgan failure when remained untreated. We encountered a rare unusual presentation of GPA with splenic infarct with normal renal function and absence of ENT and eye involvement.

Disclosure of funding source(s): none

Abstract #293

The safety, outcomes, and prognostic factors associated with medical thoracoscopy

R. Ronaghi^a (Dr), M. Ueoka^b (Dr), R. Garcia^b (Dr), C. Oberg^b (Dr), T. He^b (Dr), I. Susanto^b (Dr), C. Channick^b (Dr), S. Oh^b (Dr)

^a UCLA, Pacific Palisades, ÉTATS-UNIS ; ^b UCLA, Los Angeles, ÉTATS-UNIS

Pleuroscopy is usually used for fluid drainage, biopsy, diagnosis and pleurodesis. There has been very little data on the use of pleuroscopy for the treatment of parapneumonic and empyema. In our study we looked at the overall outcomes in our pleuroscopy cases, and to look at their use in parapneumonic and empyema. We also look at fluid characteristics that can potentially lead to complex pleural spaces.

A total of 178 patients who underwent pleuroscopy in 24 months were enrolled retrospectively in the study. Data was collected in Excel including demographics, need for pleuroscopy, final diagnosis, outcomes, pleural fluid study before the procedure and complications. Data was analyzed using SPSS software.

Of the 178 patients, 111 were malignant effusion. Overall diagnostic yield was 100%, and success for pleurodesis was 97%. The most common diagnosis was lung adenocarcinoma. 36 patients had parapneumonic or empyema. 31 were for benign causes. Of the 36 infected patients, 26 had empyema, and 10 had parapneumonic effusion. 35/36 patients required no further procedure after the pleuroscopy and wash out and were discharged from the hospital. Of all patients, a WBC count over 3204, neutrophil count above 32%, lymphocyte count over 72%, protein count over 3.6 and LDH over 164 was associated with a complex pleural space. Time between thoracentesis and development of a complex pleural space in the above patients was an average of 22.4 days. There were no complications and no mortality.

This is the largest study of its kind that shows the safety and outcome in pleuroscopy. This study also shows that pleuroscopy can be done safely and with great outcomes in patients with empyema. This is the first study to also suggest that timing from thoracentesis to pleuroscopy can be important in certain patient populations with an exudative effusion, suggesting a more aggressive approach.

Disclosure of funding source(s): none

Abstract #294

Cone Beam Computed Tomography improves the precise location of the probe when performing transbronchial cryobiopsy in interstitial lung disease

G. Vignigni^a (Dr), A. Vizzuso^b (Dr), S. Piciucchi^b (Dr), A. Dubini^c (Dr), A. Ambrosini Spaltro^c (Dr), A.J. De Grauw^a (Dr), F. Sultani^a (Dr), S. Martinello^a (Dr), C. Ghirotti^a (Dr), V. Poletti^a (Pr), C. Ravaglia^a (Pr)

^a Department of Pulmonology, "G.B. Mogagni- L. Pierantoni" Hospital, Forlì, ITALIE ; ^b Department of Radiology, "G.B. Mogagni- L. Pierantoni" Hospital, Forlì, ITALIE ; ^c Department of Pathology, "G.B. Mogagni- L. Pierantoni" Hospital, Forlì, ITALIE

Background: Transbronchial lung cryobiopsy (TBLC) is considered now a valid alternative to surgical lung biopsy for the diagnosis of interstitial lung diseases. However, the precise location of the probe and the exact distance from the pleura are sometimes difficult to establish.

Methods: This is a prospective observational monocentric study. Our aim is to find out feasibility and safety of cryobiopsy when performed under Cone Beam 3D CT (CBCT) guide. Patients with suspected diffuse parenchymal lung disease undergoing cone beam CT-guided cryobiopsy are prospectively enrolled. All demographic data, lung function tests, imaging patterns, biopsy characteristics, diagnostic yield and complications are collected. Bronchoscopies are performed through a rigid tube, under general anesthesia, in a hybrid CBCT operation room. 3D CT images are acquired and reviewed in axial, coronal and sagittal planes to accurately assess the cryoprobe position. Cryobiopsy is performed with 1.7 mm probe following probe positioning and, after each biopsy, Fogarty balloon is immediately inflated to prevent bleeding.

Results: 11 patients have been prospectively recruited until now. Enrollment will end when 30 patients will be reached. Median age was 67 years. Median FVC was 87% predicted, median DLCO was 71% predicted. A final multidisciplinary diagnosis was obtained in 100% of cases. Three patients (27%) developed a pneumothorax, which required a pleural drainage. No severe/moderate bleeding was observed.

Conclusions: CBCT-guided TBLC in patients with ILDs is associated with a promising diagnostic yield and an acceptable safety profile. A larger trial is necessary to validate the results.

Disclosure of funding source(s): none

Abstract #295

Efficacy and safety of mediastinal cryobiopsy through convex probe EBUS scope

A. Srinivasan^a (Dr), V. Pattabhiraman^a (Dr), S. Mahadevan^a (Dr), S. Annapoorni^a (Dr), A. Joy^a (Dr)

^a *Royal Care hospital, Coimbatore, INDE*

Purpose: To evaluate the feasibility, safety and yield of cryobiopsy of mediastinal adenopathy through convex probe EBUS scope using 1.1 mm diameter cryoprobe.

Methods: Retrospective analysis of records of patients undergoing convex probe EBUS for mediastinal adenopathy between January 2021 and May 2022 at a tertiary care referral centre. Procedures were carried out under general anaesthesia through laryngeal mask airway with convex probe EBUS scope with TBNA being performed first with 19 G Olympus needle and 1.1 mm cryoprobe being introduced thereafter through the same entry point.

Results: A total of 152 EBUS TBNA were carried out during the study period. Of these, cryo biopsy was attempted in 83 procedures (83/152; 55.14%) and was successful in obtaining tissue in 77 patients (77/83; 92.7%). There were 44 males (57.14%), 33 females (42.86%) with a mean age of 52.93 years. With TBNA, the mean number of nodes sampled per patient was 1.45 and mean passes per node was 3.59 with a diagnostic accuracy of 89.6 %. With cryo biopsy, the mean number of nodes sampled per patient was 1.09 and mean passes per node was 2.6 with a diagnostic accuracy of 90.9 %. Cryobiopsy and TBNA yielded same diagnosis in 57 patients (74.02%), increased the confidence of diagnosis when used in combination in 9 patients (11.68%; cryobiopsy in 7 and TBNA in 2), cryobiopsy alone resulted in diagnosis in 6 (7.79%) patients and TBNA alone in 6 (6.49%) patients. The combined diagnostic accuracy of TBNA and cryobiopsy was 97.4% (75/77). All patients tolerated the procedure well with no major complications and were discharged on the same day.

Conclusion: Mediastinal cryobiopsy is a safe additional procedure to convex probe guided EBUS TBNA which yields biopsy tissue in majority of the cases and has potential to complement and or improve diagnostic efficacy of EBUS TBNA cytology.

Disclosure of funding source(s): none

Abstract #296

Flexible bronchoscopic complete removal of the longest ever documented -7cm tumor- A nerve sheath tumor along with EUS-B-FNA for staging in the same sitting under conscious sedation

V. Chachra^a (Dr), A. Mendiratta^a (Dr), M. Ketkar^a (Dr), G. Agarwal^a (Dr)

^a Max Superspeciality Hospital, Dehradun, INDE

Background:

In the lung, neurogenic tumors are a rare clinical entity. Malignant tumors causing central airway obstruction usually are provided with a palliative form of intervention, with minimal invasive techniques including electrocautery, argon-plasma or cryotherapy.

Case Report:

A 64 year old female patient with history of asthma, diabetes and hypertension having non resolving shortness of breath despite treatment optimization. A HRCT chest was suggestive of soft tissue opacity in the right main bronchus and protruding out at carina. Patient came to us with 2 failed rigid bronchoscopy attempts for the lung mass causing central airway obstruction and even a diagnosis was yet to be proven. The mass completely occluded the right main bronchus. PET scan was suggestive of active multiple mediastinal lymph nodes with non tracer avid bronchial mass in right intermediate bronchus. She was also subjected to serum 5-alpha DHT, 5-HIAA, Chromogranin A, which all were normal.

Eventually through flexible bronchoscopy the tumor extraction with the help of electrocautery snaring and argon-plasma coagulation was done and the entire 7 centimeter tumor was removed successfully in a single piece. In the same sitting PET positive lymph node sampling was also done through esophageal route (EUS-B-FNA). The tumor was sent for immunohistochemistry evaluation which turned out to be primary pulmonary schwannoma. Lymph nodes were only reactionary.

Conclusion:

Flexible bronchoscopy at times can be superior than rigid in a few therapeutic interventions where distal airways are involved. Not only the longest tumor was retrieved itself with a flexible bronchoscope it was not a palliative form of treatment but also complete recanalization and restoration of the airway along with a tumor free patient. Also in the same sitting staging of the tumor through the esophageal route from an Endobronchial Ultrasound (EUS-B-FNA) was done and achieved the desired outcome in only conscious sedation. The patient was discharged 36 hours post procedure tumor free.

Disclosure of funding source(s): none

Abstract #297

An atypical presentation of Signet-Ring Cell Adenocarcinoma of the lung with pleural effusion - a case report

G. Lekatsas^{*a} (M.), G. Chrysofakis^a (M.)

^a *General Hospital of Rethymno, Rethymno, Crete, GRÈCE*

Background

Signet-Ring Cell Adenocarcinoma (SRCA) is a subtype of adenocarcinoma occurring mostly in the gastrointestinal tract. Primary SRCA of other organs are rare, such as breast and lung.

Case report

We present a case of a 77-year-old patient who was referred to our hospital due to fever, non-productive cough in the last 2 days. He mentioned progressively worsening dyspnoea during the past month. The CT scan revealed large unilateral pleural effusion on the left hemithorax with secondary compressive atelectasis and consolidation pattern of the left lung. Empiric antibiotic therapy for pneumonia was initiated. The diagnostic thoracentesis revealed an exudate with neutrophilic predominance. The cytologic examination of the fluid was positive for malignant undifferentiated cells, so further investigation was decided. The patient underwent flexible bronchoscopy which revealed diffuse inflammatory and oedematous bronchial mucosa of the left bronchial tree. The specimens taken by biopsies and brushing were positive for SRCA and the IHC was suggestive for the lung as the primary site.

Conclusion

Primary lung SRCA can be a challenge to diagnose due to its rarity (0.14% to 1.9% of all lung cancers) and the heterogeneity of clinical manifestations. It is important to In our case, we performed and extensive diagnostic workup and we reached the diagnosis of a rare malignancy with atypical presentation (20% of pleural effusions with neutrophilic predominance are malignant).

Bibliography

1. O. Kocas et al., Primary signet ring cell carcinoma of the lung with cerebellar metastasis showing full response to cisplatin and docetaxel therapy, *CROM*, 2014
2. J.Kovacevic et al., Pulmonary Adenocarcinoma With Signet Ring Features: An Unusual Case of a Rare Disease, *ACCP*, 2017
3. M. Benesch and A.Mathieson, Epidemiology of Signet Ring Cell Adenocarcinomas, *Cancers*, 2020
4. Y.Mingguang et al., A case report of primary signet ring cell carcinoma of the lung: imaging study and literature review, *TLCR*, 2021

Disclosure of funding source(s): none

Abstract #298

A complex approach to a complex stenosis

S. Silva^{*a} (Dr), J. Eusébio^a (Dr), M. Santos^a (Dr), V. Martins^a (Dr), M. Aguiar^a (Dr), F. Todo Bom^a (Dr)

^a *Interventional Pulmonology Unit, Pulmonology Department, Hospital Beatriz Ângelo, Loures, PORTUGAL*

Background

Most tracheal tumors occur by direct invasion of lung and esophagus carcinomas; primary tracheal tumors are rare. More than half are squamous cell carcinoma (SCC), which have a worse prognosis. In unresectable SCC, concurrent chemoradiotherapy (CRT) is the best option; 5-year survival rate is 7%.

Case report

We present a case of a 56-year-old man, 40 pack-year smoker, who came to the emergency room on Oct/2016 referring dyspnea and stridor for 2 months. Thoracic computer tomography revealed significant tracheal obstruction. He underwent rigid bronchoscopy (RB) that showed tracheal occlusion of 80% by tumoral mass and was submitted to debulking with recanalization of 70%. Biopsies confirmed SCC and patient was staged as IIIB. CRT was started with clinical and endoscopic improvement.

After 6 months, he developed a symptomatic and complex grade III radiation stenosis, with 8 cm of length and progressive dilations with local methylprednisolone were performed. Biopsies and restaging were negative. Patient performed several dilations with significant benefit; but after 2 years, a new worsening lead to the need of surgical resection of three tracheal rings with an end-to-end anastomosis.

On March/2020, patient had lung recurrence and started chemotherapy. Sixteen months after surgery, patient had worsening dyspnea and a new simple web stenosis with 3 mm appeared on anastomosis site. A cut and dilation were made, followed by dilation with mitomycin application with improvement.

Patient is under second-line immunotherapy and with an excellent performance status, six years after the diagnosis, with partial response and stability of tracheal lumen with known caliber of 12 mm.

Conclusion

Our patient had multiple tracheal pathology from multiple etiologies over time: tumoral, sequelae from radiation and benign stenosis in the site of surgical intervention, requiring multicentric approach. Tracheal tumors are complex and require multidisciplinary discussion and treatment.

Disclosure of funding source(s): none

Abstract #299

Intracavitary fibrinolysis directly under vision during medical thoracoscopy

E. Stirpe^{*a} (Dr), J. Koehl^a (Dr)

^a *Unit of Respiratory Diseases, Bolzano Hospital, Bolzano, ITALIE*

Background: Multiloculated pleural effusion or trapped lungs often occur in patients with malignant pleural effusions. These conditions limit the view during medical thoracoscopy (MT), making it difficult to perform pleural biopsies.

Clinical Case: in a 71-years old man with right complicated pleural effusion we observed a remarkable intrapleural fibrin deposition during MT. We attempted to breakdown mechanically the fibrin networks, but it was not possible to see the parietal pleura. Therefore, we reconstituted 100,000 IU urokinase in 50 mL of 0.9% saline solution and instilled into the pleural cavity using a syringe connected to the MADmagic® (Teleflex Medical, Morrisville, NC, US), normally used to instill local anesthetics on the laryngo-tracheal mucosa. The MADmagic® was passed with the thoracoscope through the trocar, making it possible to see in real time where the solution was directed. In the meanwhile, we checked the action of the urokinase under vision. After about 10 minutes, we observed that the network of septa had significantly decreased and that some portions of the parietal pleura were visible. No bleeding was observed. We then identified where to take pleural biopsies in different points in the parietal pleura. MT ended without any complications. The diagnosis was pleural localization of squamous lung cell carcinoma.

Conclusions: Our case shows that the direct instillation of intrapleural urokinase during thoracoscopy could expand the therapeutic capacity of the MT and fibrinolysis and expand the diagnostic capacity of MT. In addition, direct vision of the jet of solution containing fibrinolytic may further reduce the risk of bleeding in patients with malignant pleural effusions.

References:

1. Murthy V et al. J Thorac Dis. 2017 Sep;9(Suppl 10):S1011-S1021.
2. British Thoracic Society Pleural Disease Guideline 2010. Thorax. 2010 Aug;65 Suppl 2:ii54-60.
3. Khemasuwan D et al. Chest. 2018 Sep;154(3):550-556.

Disclosure of funding source(s): none

Abstract #300

A rare case of cholangiosarcoma metastatic to the pleura, diagnosed the old way

A. Zetos^a (Dr), I. Michailidou^{*a} (Dr), V. Petta^a (Dr), S. Kaltsas^b (Dr), K. Fragia-Tsivou^c (Dr), D. Bisirtzoglou^a (Dr)

^a Agios Savvas General Oncological Hospital of Athens, Athens, GRÈCE ; ^b Lamia General Hospital, Lamia, GRÈCE ; ^c HBD HistoBioDiagnosis, Athens, GRÈCE

Background: Cholangiocarcinomas (CCAs) are diverse biliary epithelial tumors involving the biliary tree. They have extremely aggressive metastatic behaviour resulting in a very poor prognosis. Metastasis are usually observed at intrahepatic site, local and distal lymphnodes and peritoneum. Pulmonary and pleural metastasis are very rare. Abrams needle biopsy is a “blind” or closed pleural biopsy used since 1955, which tends to be abandoned, but still in use in our department.

Case report: We describe the case of an 82 years-old male, who was diagnosed with mediastinal lymphadenopathy and pleural effusion after an accident. The patient had a history of cholangiocarcinoma treated with surgery after induction chemotherapy with oxaliplatin/5FU, two years ago. The patient was submitted to bronchoscopy and mediastinal lymphnodes sampling with EBUS, which was negative for malignancy. A pleural biopsy with Abrams needle followed and the histology was positive for metastatic adenocarcinoma from the biliary tract.

Conclusion: Pleural dissemination of cholangiocarcinoma is rare and diagnosis is usually relied on video-assisted thoracoscopic surgery. The sensitivity of Abrams biopsies for malignancy ranges between 27% and 60%, and, in the largest review of 2,893 Abrams samples, the diagnostic yield for malignancy is 57%. Still, in experienced hands, it can help diagnose exudative lymphocytic pleural effusions when image-guided techniques are unavailable or if the patient is not unable to tolerate thoracoscopy and also as a first-line diagnostic tool in resource-poor settings. In our case, a rare disease was diagnosed in an old-fashioned way, reminding us it is a skill not to be abandoned.

Dziodzio T et al. Pleural Carcinosis of a Cholangiocarcinoma. *ACG Case Rep J* 2019;6:1-2

Okuda MD. Clinical Aspects of Intrahepatic Bile Duct Carcinoma. *Cancer* 1977; 39:232-245

Bibby AC et al. Pleural biopsies in undiagnosed pleural effusions; Abrams vs image guided vs thoracoscopic biopsies. *Curr Opin Pulm Med*. 2016 Jul (4):392-8

Disclosure of funding source(s): none

Abstract #301

Allergic bronchopulmonary aspergillosis without asthma

E. Stirpe^{*a} (Dr), J. Koehl^a (Dr)

^a Unit of Respiratory Diseases, Bolzano Hospital, Bolzano, ITALIE

Background: Allergic bronchopulmonary aspergillosis (ABPA) most commonly occurs in patients with bronchial asthma, which may sometimes be absent. The majority (97%) of patients with ABPA without asthma have underlying lung diseases (e.g TBC, bronchiectasis). Because of the absence of asthma, patients with ABPA without asthma are initially misdiagnosed as bronchogenic carcinoma, pulmonary tuberculosis and others.

Clinical Case: a 40 years-old woman with a right upper lobe pulmonary infiltrate had leucocytosis, hypereosinophilia, increased markers of inflammation. On bronchoscopy, the upper lobar bronchus mucosa was oedematous and hyperemic without irregularity, with purulent secretions obstructing the lumen. BALF and bronchial biopsies showed hypereosinophilia, fungal hyphae. Serum probes showed both total IgE and titers of specific IgE against *Aspergillus fumigatus* elevated. Lung function tests were normal. Thus, all the diagnostic criteria for ABPA were met except for the presence of asthma. We treated the patient with Voriconazol and Prednisone, with a rapid clinical, radiological and serological improvement.

Conclusions: Although our patient did not have asthma, she had raised total IgE. Therefore, sensitization to *Aspergillus* may have occurred followed by development of ABPA. The role of the anti-fungal, especially in chronic treatment, remains doubtful, as the main pathogenetic mechanism is the allergic reaction to the fungus and not the presence of the fungus itself. Compared to ABPA with asthma, ABPA without asthma appears to be related to less respiratory functional impairment and especially less tendency to relapse. ABPA without asthma appears to be a different subgroup of ABPA, with better lung function and fewer exacerbations. Bronchoscopy becomes decisive when the diagnostic criteria of ABPA are not completely fulfilled.

References:

1. Muthu V et al. Med Mycol. 2020 Feb 1;58(2):260-263.
2. Agarwal R et al. Indian J Med Res. 2020 Jun;151(6):529-549.
3. Kanj A et al. Respir Med. 2018 Aug;141:121-131.

Disclosure of funding source(s): none

Abstract #302

SARS-CoV-2-associated pulmonary aspergillosis

J. Koehl^{*a} (Dr), E. Stirpe^a (Dr)

^a Unit of Respiratory Diseases, Bolzano Hospital, Bolzano, ITALIE

Background: SARS-CoV-2-associated pulmonary aspergillosis (CAPA) has been described in COVID-19 patients with acute respiratory distress syndrome. The pathogenesis is incompletely understood but several immunological mechanisms may be responsible for the development of CAPA as well as other fungal infections.

Clinical Case: a 61-years old man was recovered in Covid-Unit because of severe bilateral Sars-CoV-2 related pneumonia complicated by a little left pneumothorax. He was treated with non invasive mechanical ventilation (NIV) and O₂ therapy with high flow nasal cannula (HFNC). The thorax-CT performed for the follow-up showed the presence of a new round solid lesion in the left upper lobe. We performed a bronchoscopy, which showed the BALF positive for *Aspergillus*. The patient undergone therapy with Prednisone and Voriconazol. Due to the poor clinical response, the patient underwent left upper lobectomy surgery.

Conclusions: COVID-19 is associated with an immunosuppressive state, exacerbated by corticosteroid treatment, resulting in a higher propensity to co-infections (bacterial, viral or fungal). CAPA is a new entity in critically ill patients infected with COVID-19, most of whom are in ICU treated with mechanical ventilation and corticotherapy. Comorbidities also predisposes to the development of this fungal infection, but not the classical classic factors for invasive pulmonary aspergillosis (e.g. haematological malignancy or neutropenia). The timely diagnosis of CAPA is a challenge since the clinical features are non-specific, and because of the delay of diagnosis the mortality risk is up to 40%. The first choice investigation for pathogen isolation is bronchoscopy, which enables a diagnosis to be made quickly and at low cost.

References:

1. Chaurasia S et al. The American Journal of Tropical Medicine and Hygiene. 2022;106(1):105-107.
2. David F et al. EJCRIM 2022;9:doi:10.12890/2022_003209.
3. Marr KA et al. Emerg Infect Dis. 2021;27(1):18-25.

Disclosure of funding source(s): none

Abstract #303

A rare presentation of lung adenocarcinoma presenting as posterior tracheal mass

C. Michaela^{*a} (Mlle)

^a Pulmonology Resident Brawijaya University, Malang, *INDONÉSIE*

A rare presentation of lung adenocarcinoma presenting as posterior tracheal mass

Yani Jane Sugiri^{1,2}, Ngakan Putu Parsama Putra^{1,2}, Cleine Michaela^{1,2}

¹Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia.

²Dr. Saiful Anwar General Hospital, Malang, Indonesia.

Background Lung adenocarcinoma is the most common type of non-small cell lung cancers (NSCLCs). It represents about 40% of all cases of lung cancer, and even though is strongly correlated with smoking, it is also the most common subtype found in nonsmokers. Clinical presentation of adenocarcinoma varies widely and is often found in late stages which carries poorer prognosis and limited therapeutic options.

Case presentation A 69-year-old nonsmoker woman with a history of year-long history of dry cough which worsened in the last 2 months. The cough is also accompanied with hoarseness and snoring, which prompt her to visit an ENT specialist. A laryngoscope reveals paresis of right vocal cord and a right tracheal mass on CXR. A neck CT reveals a thickened posterior tracheal wall with a suspicion of malignancy and lateral bowing of right vocal cord, but with no abnormality in chest CT. She was then referred to our pulmonology department for tissue sampling using bronchoscopy. Bronchoscopy showed an infiltrative stenosing with a suspicion due to malignancy. A forceps biopsy obtained via bronchoscopy reveals an adeno/adenosquamous carcinoma morphology. Further immunohistochemistry test shows a positive Napsin-A and negative TTF-1 and p40 consistent with adenocarcinoma with wild-type EGFR mutation. She was treated with systemic chemotherapy with local protocol.

Conclusion The high number of cases of lung adenocarcinoma, accompanied with subtle clinical presentation which often delay the diagnosis, should prompt clinicians to be more aware for the possibility of the disease even with no obvious abnormality in chest imaging.

Keyword: Lung adenocarcinoma, Tracheal mass, Lung cancer

Disclosure of funding source(s): none

Abstract #304

Insertion of an endobronchial silicone spigot under retrograde guidewire assistance: a simple technique for bronchopleural fistula closure

K. Fukumoto^a (Dr), N. Hiyama^a (Dr), J. Matsumoto^a (Dr)

^a *NTT Medical Center Tokyo, Tokyo, JAPON*

Background

Treatment of empyema is difficult and often has an intractable course, especially if bronchopleural fistula exists. Closing the fistula is essential for successful treatment of empyema, and bronchial occlusion using silicone spigot, including Endobronchial Watanabe Spigot (EWS), is a promising approach. However, inserting spigots into sharp angled bronchi under endoscopic manoeuvre is often technically demanding.

Case report

A 73-year-old man underwent chest wall tumour resection combined with deep wedge resection of upper and lower lobe of the right lung for postoperative chest wall recurrence of oesophageal carcinoma. Eleven months later, he developed empyema and open-window thoracostomy was immediately performed. Multiple bronchopleural fistulae were noted.

From the open wound we inserted a guidewire into each fistula, and identified that B3b, B6b+c, B8b were the responsible bronchi. The guidewire was endoscopically introduced out of the endotracheal tube, and we pierced the guidewire through the silicone spigot. Then, under endoscopic observation, silicone spigots were automatically inserted, and fixed into each fistula by pulling the guidewire. After the procedure, negative-pressure wound therapy (NPWT) was firmly applied to the open wound with no air leakage.

Conclusion

This retrograde guidewire insertion technique of silicone spigots is an effective method for treatment of bronchopleural fistula.

Disclosure of funding source(s): none

Abstract #305

GS versus no GS transbronchial cryobiopsy for the diagnosis of radial EBUS eccentric solitary pulmonary nodules

J. Votruba*^a (Pr), Z. Sestakova^a (Dr)

^a 1st Chest clinic Charles University, Prague, TCHÈQUE, RÉPUBLIQUE

Transbronchial biopsy is an indispensable tool for the diagnosis of solitary pulmonary nodules. Its yield is however still not competitive with transparietal approach or surgical biopsy. Various methods of navigation to SPN have been developed, many of them are hindered by insufficient amount of biopsy material. It is why many centers decided to employ cryobiopsy in this process which can provide pathologist with substantial volume of tissue.

Methods: We have compared two methods of cryoprobe placement - transbronchial cryobiopsy after fluoroscopic navigation of rEBUS to ideal position and transbronchial cryobiopsy after GS + fluoroscopic navigation to ideal position. In both groups only eccentrically visualized SPNs have been utilized for statistical evaluation. Study was monocentric and retrospective evaluating 326 patients from 6/2020 to 2/2022

Results: 329 SPNs have been deemed by bronchologist as eccentrically visualized by radial EBUS. 212 cases in non-GS group and 117 in GS group. In all cases only one transbronchial cryobiopsy was done. Morphological diagnosis was obtained in 137 patients in non- GS group (64,62%) and 88 (0,75%) (p 0,001) in GS group.

Discussion: GS based approach showed significantly higher diagnostic yield in our group of patients undergoing transbronchial cryobiopsy for SPN.

Disclosure of funding source(s): none