

The Clinical Usefulness of Endobronchial Watanabe Spigot (EWS) for Intractable Pneumothorax and Postoperative Air Leaks

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Background:

Secondary spontaneous pneumothorax occurs as a complication of an underlying lung disease and is more difficult to treat. The longer the hospitalization period becomes, the worse the management of patient's condition becomes especially in elderly patients. Persistent air leaks are also troublesome for many clinicians with the prediction that improvement is unclear. The purpose of this study is to evaluate the usefulness and efficacy of using Endobronchial Watanabe Spigot (EWS) on pulmonary air leaks, measured by whether EWS can reduce or stop them, can achieve the expansion of the lung and can result in the successful removal of chest tubes. We, therefore, report our experience in those management with EWS, and hope that our treatment method will be the useful method for many clinicians.

Methods:

A retrospective clinical study was conducted on 40 intractable pneumothorax and 5 postoperative patients between January 2004 and March 2013. EWS is a silicone made bronchial blocker developed by Watanabe in 1989. In case with persistent air leaks, chest tubes were inserted into the thorax firstly and then the bronchial occlusion with EWS was performed. If there were no improvements shown, we applied the occlusion several times, and sometimes gave the combination therapy with pleurodesis or coagulation factor X III agent as the multiple treatment method.

Results:

The most underlying diseases were COPD that were noted in 24 cases (60%). The size of pneumothorax was greater than medium size in all patients and home oxygen therapy had already been prescribed before pneumothorax occurred in 12 patients (26.6%). The success rates of the treatment with EWS alone and of which including combination treatment with pleurodesis or factor X III were 85.7% and 77.8%, respectively. EWS alone and combination therapy enabled the complete expansion of the lung in intractable pneumothorax cases (except 3 fenestration cases) in 81.1% (30/37). The effect of EWS was obvious, which often enabled pleurodesis to be more successful. Chest tube removal was achieved in 41 cases (91.1%). Concerning complications, three cases showed pneumonia suggestive of fungal infection after long time placement (8months, 21months, 4years) of EWS and we think that caution must be taken in long term placement of EWS especially in compromised or infected patients with severe bullous changes in their lungs.

Conclusion:

By stopping air leaks and curing intractable pneumothorax, EWS is of great use as a bronchial blocker for patients who are unlikely able to have chest tubes removed.

Treatment Outcome

EWS use for intractable pneumothorax (median)

5.0 pieces /case

2.0 times /case

treating method

EWS alone 21/45 (46.7 %)

EWS combined with pleurodesis 7/45 (15.6 %)

EWS combined with factor XⅢ 6/45 (13.3 %)

EWS combined with pleurodesis + factor XⅢ 11/45 (24.4 %)

decreasing or stopping in air leaks by EWS alone 18/21 (85.7%)

decreasing or stopping in air leaks in total 35/45 (77.8%)

complete expansion of the lung in intractable pneumothorax + 30/37 (81.1%)

(except 3 fenestration cases) - 6 /37 (16.2%)

unevaluable 1 /37

chest tube insertion period (median days, range)

37 intractable pneumothorax cases 44 (14-183)

(except 3 fenestration cases)

5 postoperative cases 41 (14-62)

treatment process

chest tube removal 41/45 (91.1%)

fenestration 3/45 (6.7%)

death (no relation to EWS use) 1/45

complications

(short term) reexpansion pulmonary edema 1

(long term) pneumonia (suggestive of fungal infection) 3

organizing pneumonia (1case of the above 3) 1
