

European Respiratory Society Annual Congress 2012

Abstract Number: 1644

Publication Number: 4728

Abstract Group: 1.4. Interventional Pulmonology

Keyword 1: COPD - management **Keyword 2:** Bronchoscopy **Keyword 3:** No keyword

Title: Pneumothorax as a predictor of beneficial outcome following endoscopic lung volume reduction

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Body: Introduction: Patients developing significant target lobe volume reduction (TLVR) following endobronchial valve (EBV) treatment experience great improvement in clinical outcome measures. A prospective multicenter study confirmed an improvement in FEV1, SGRQ and 6MWD in patients with a TLVR > 350 ml. However, the risk of pneumothorax increases in case of rapid TLVR by parenchymal rupture. Therefore it is thought, that a pneumothorax is a predictor of beneficial outcome following EBV therapy. Objective: To evaluate the impact of the pneumothorax on outcome following EBV treatment. Methods: Retrospective analysis of a multicenter trial evaluating the impact of the pneumothorax on outcome following EBV treatment. All patients underwent chest x-ray the same day of EBV implantation for exploration of pneumothorax. 30 days following valve implantation, TLVR assessed by high resolution computed tomography (HRCT) and clinical outcome measures (FEV1, SGRQ, 6MWT) were evaluated. Results: 96 emphysema patients received EBV therapy, of which 41 patients experienced a TLVR > 350 ml. In totally, 8 patients (8.3%) experienced a pneumothorax following EBV placement. TLVR values were available for 6 out of the 8 patients. All 6 achieved TLVR > 350ml cut off for the study. The mean TLVR as well as the improvement in FEV1 was greater in the group of patients who experienced a pneumothorax (n=6; mean TLVR -2273.2 ml, mean % FEV1 23.8 ± 10.6) compared to those who did not (n=35; mean TLVR -1222.1 ml, mean % FEV1 22.3 ± 24.01). All patients required chest drainage and recovered within 3-14 days. Conclusion: The event of pneumothorax seems to be a predictor of a great outcome following EBV therapy.