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Quantitative fissure analysis as pneumothorax predictor after bronchoscopic lung volume reduction with endobronchial valves

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Abstract

Background: Bronchoscopic Lung Volume Reduction (BLVR) with endobronchial valves (EBV) has widely spread across the world as one of the main strategies to treat patients with severe COPD with emphysema causing air trapping and hyperinflation. It carries a relatively high risk of pneumothorax of around 30%. Anticipating the risk of pneumothorax could be invaluable for clinician and patients. An essential tool during the workup for BLVR with EBV is the Quantitative Fissure Analysis (QFA) obtained from a Chest CT. We hypothesized that the QFA may be utilized to predict lung dynamics post procedure and subsequently estimate the risk of pneumothorax.

Methods: A retrospective multicenter study cohort of patients who underwent BLVR with BV was studied. Variables such as demographics, comorbidities, anthropomorphics, pulmonary function tests and QFA were analyzed. Our main objective was to detect variables, in the QFA, specific to patients who developed pneumothorax. We emphasized variables such as Target Lobe Volume (TLV), Non-Target Lobe Volume (NTLV), their difference and ratios, and the relationship among destructions scores.

Results: The entire cohort included 147 patients (55.78% women). The most common comorbidity was hypertension (48% of the patients). A total of 43 patients (29.25%) developed pneumothorax post BLVR with EBV. The only anthropomorphic variable with a statistically significant difference between patients who developed or not pneumothorax was BMI (23.40% vs 25.49 %). This difference may not be clinically relevant. No others statistically significant difference was noted between our two groups.

Conclusion: The variables in the QFA of patients who developed pneumothorax post BLVR with EBV had no statistically significant difference when compared to those of patients who did not develop pneumothorax post procedure. The QFA may not be able to predict this adverse effect and more studies are needed to confirm our conclusion.

Biography

David Abia-Trujillo is a Mexican physician who completed his medical school at Universidad Autonoma de Queretaro. He obtained his Internal Medicine degree form Atlantic Health System in Morristown Medical Center at Morristown, New Jersey. He completed his Pulmonary and Critical Care Medicine fellowship in Mayo Clinic Florida. Currently he is undergoing subspecialized training in Interventional Pulmonology at the Harvard combined BIDMC-MGH program. His main interests are bronchoscopic treatments for advanced COPD and management of pleural diseases.

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