Bronchial Injuries May Occur during Cryo-balloon Ablation for Atrial Fibrillation without Noticing

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Introduction: It was recently reported that unrecognized endobronchial ice formation occurs frequently during pulmonary vein isolation (PVI) using cryo-balloon ablation (CBA) for atrial fibrillation (AF), which means that CBA could lead to thermal injury to the airways. The purpose of this study was to investigate whether bronchial injury could occur during CBA for AF.

Methods: Consecutive AF patients who underwent CBA between Feb, 2016 and Sep, 2017 were enrolled. Among them, the following subjects were excluded; 1) patients with bronchial asthma or COPD; 2) patients with pulmonary tuberculosis sequelae; 3) postpneumonectomy patients; 4) patients who could not perform spirometer due to physical frailty or cognitive function decline before CBA. Spirometry examinations were performed before and within 48 hours after CBA and the changes of forced expiratory volume in one second (FEV1.0), which is defined as expiratory volume that has been exhaled at the end of the first second of a maximally forced expiration maneuver, after CBA were evaluated. The most common cause of reduction in FEV1 is the increased airway resistance. By reference to positive criteria of bronchodilator reversibility test, a “significant” change in FEV1 after CBA was defined as a decrease of at least 12% and 200ml.

Result: A total of 118 patients including 39 female were assessed with a mean age of 65.8±9.9 years. Complete PVI was achieved in all patients. FEV1.0 significantly reduced after CBA (2.56±0.71L to 2.37±0.67L, p<0.01). A significant decrease in FEV1.0 was detected in 25 patients (21.1%). Hemosputum was observed in 2 (1.7%), both of whom had the significant decrease in FEV1.0.

Conclusion: CBA for AF might relatively often result in unintentional bronchial injury, most of which seem to be subclinical.