Importance of surface cooling during targeted lung denervation for COPD

Martin Mayse[1], Philip Johnson[1], James Hummel[2]

[1] Holaira, Inc., Minneapolis, MN, USA

[2] University of North Carolina, Chapel Hill, NC, USA

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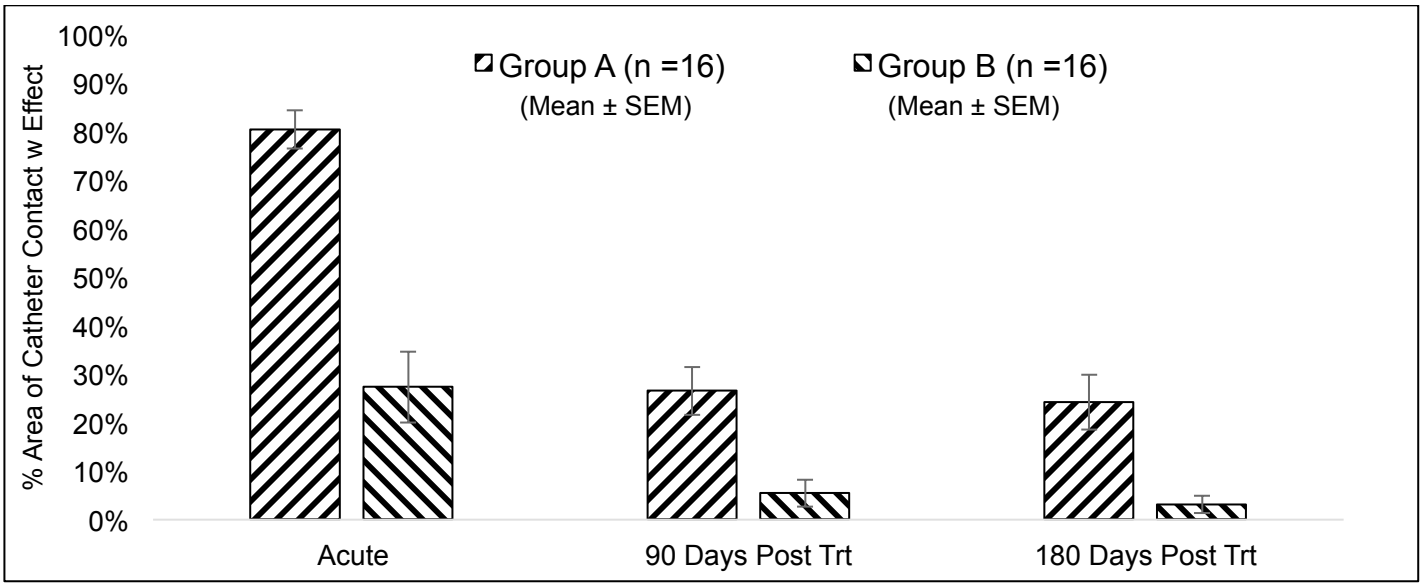
Introduction: Targeted lung denervation (TLD) utilizes circumferential radiofrequency (RF) ablation within the right and left main bronchi to disrupt parasympathetic nerve inputs. One potential concern with bronchial ablation is epithelial damage, which could possibly lead to stenosis. The Holaira RF catheter has a novel dual cooled design with a separate cooling balloon to protect the airway surface.

Aim: To examine the effects of efficient surface cooling during the TLD procedure on the bronchial epithelium.

Methods: The lungs of 16 sheep (32 airways) underwent TLD with a lung denervation system (Holaira, Inc., USA) and were followed for 180 days. Poor contact of the cooling balloon to the bronchial surface adjacent to ablation was noted in the first 8 animals (group A). Modifications to the balloon/procedure were made to provide more consistent contact during ablation in the final 8 animals (group B). Changes in the airway surface at the ablation sites were evaluated by bronchoscopy immediately following the procedure and at 90 and 180 days.

Results: Acutely and after 90 and 180 days, airways in group B had significantly less visible effects of RF delivery than in group A. Two airways in group A presented with 10 to 15 percent stenosis in airway cross section at 180 days. No incidences of stenosis were present in group B.



Conclusions: Efficient airway surface cooling minimizes chronic changes in airway architecture following TLD.