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**Title:** Evaluation of unilateral complete occlusion and bilateral partial occlusion endobronchial valve treatments using quantitative CT

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**Body:** Background: Unilateral complete occlusion (UCO) and bilateral partial occlusion (BPO) methods have been used in bronchoscopy-guided device therapies for severe emphysema patients. Purpose: To evaluate UCO and BPO treatments using quantitative CT. Methods: Lobe volumes of baseline and 3-month follow-up CT scans were analyzed for each patient in the two groups (UCO: 9; BPO: 10). Fissure integrity (FI), emphysema score (ES), and heterogeneity score (HS) were calculated from baseline scans and valves were reviewed in follow-up scans. Results: The targeted lobe volume reduction (TLVR) in the UCO group (-769.4±652.8cc) was significantly larger than in the BPO group (-67.0±125cc, p=0.01). FI, EP and HS did not show significant differences between the two groups. In the UCO group, TLVR≥350cc was observed in 6 cases, of which 4 had fully collapsed lobes. By contrast, only 1 patient in the BPO group had TLVR≥350cc. There were incomplete lobar occlusions in all BPO cases as defined by treatment protocol. 3 non-responding UCO cases showed evidence of incomplete occlusion (e.g. incomplete fissures, inadvertent open airways). Conclusions: Complete occlusion of the target lobe seems essential for responsive therapy. Quantitative CT has promise to effectively plan lobar reduction therapies and monitor treatment response to increase the yield of these promising therapies.