

QUANTITATIVE CT ASSESSMENT OF BRONCHOSCOPIC LUNG VOLUME REDUCTION WITH VALVE

Top Author: **Junfang Huang**

*Department of respiratory medicine, Peking University first hospital
China*

Area and Category(at submission):

[WCBIP] Bronchoscopic lung volume reduction for COPD

Presentation Preference: Either

Case Report: NO

PURPOSE: To evaluate changes in quantitative parameters at CT scan, as well as lung function, activity endurance and symptom score after valve lung volume reduction procedure in COPD patients

METHODS: four COPD patients, accepted valve volume reduction procedure during Sep.1st, 2011 and Dec 31st, 2012, were enrolled into the study. A retrospective analysis of lung function, 6MWD(six-minute walk distance), Borg scale and CT quantitative parameters before and after the procedure within three months was performed. The volume and %LAV₋₉₅₀(low attenuation volume<-950HU), in each lobe as well as Ai(lumen area), WA%(percentage of wall area) of bilateral B1, B4 and B10 were compared by using ADW 4.2 software.

RESULTS: Operative sides included two right upper lobes, one right middle lobe and one left lower lobe. After the procedure, 2(0.5-7)points($P=0.147$) of best Borg scale decrease was observed. The best 6MWD improvement was 175.25 (55-290) meters, improved by 153.9(23.91-241)% ($P=0.05$). The best improvement of FEV1 was 0.22(0.12-0.47)L, improved by 48.41(20.34-70.15)% ($p=0.057$), while FVC was 0.74(0.36-0.75)L, improved by 42.63(18.65-48.04)% ($P=0.012$). The largest RV reduction was 0.92(0.65-1.12)L ($P=0.003$) and RV%TLC was 7.5(5.83-11.53)% ($P=0.009$). For quantitative CT analysis, there were seven ipsilateral and eight contralateral lobes for measurement. Likewise, there were eight ipsilateral and twelve contralateral bronchi. Of the seven ipsilateral non-targeted lobes, six were observed with volume expanding by 0.15 (-0.03-0.35)L, ($P=0.041$). Four of nine contralateral lobe volumes were decreased. %LAV₋₉₅₀ was reduced in all target lobes, six of seven ipsilateral lobes reduced by 3.59 (-0.95-9.62) % ($p=0.031$). Ai enlargement [2.85 (-6.5-9.5) mm², $p=0.164$] and WA% [2.7 (-9.9-13.2) %, $P=0.547$] reduction were observed in five of eight ipsilateral bronchi and nine of twelve contralateral bronchi [2.35 (-1.4-9.8) mm² for Ai, $P=0.016$; 2.9 (-5.3-10.3) %, $P=0.051$ for WA%].

CONCLUSIONS: The four COPD patients accepted bronchoscopic valve volume reduction got significant improvement physiologically. Quantitative CT analysis revealed that valve volume reduction not only reduce the volume of the target lobes but also have beneficial effects on ipsi- and contralateral lobes. It can increase the volume of non-target lobes, dilate non-target bronchi and alleviate air trapping.