CASE STUDY
InterVapor®

Uptake Medical®
A Broncus Company

Treating Physician: PD Dr. med. Daniel Franzen
Hospital / Country: University Hospital Zurich, Switzerland

Patient Background

Age / Gender: 64-year, female COPD
Disease:
Clinical History: A 64-year old female patient was referred for evaluation of increasing dyspnea five months after bilateral thoracoscopic LVRS in her upper lobes. Immediately after LVRS she had noticed some improvement of her dyspnea, but this continued only for three months. Since then, her symptoms slowly returned to baseline. Compared to preoperative values, her FEV1 had slightly decreased, and residual volume (RV) had increased by 220 ml. According to her recent bodyplethysmography with RV of 5.08 l (295% predicted) and RV/total lung capacity (TLC) of 0.77, symptomatic hyperinflation was suspected. Her drug treatment included inhalative tiotropium and fluticasone/salmeterol, and theophylline 1 x 200mg orally, which was unchanged to preoperative. Inhalation technique was checked and found to be accurate. Other causes of increasing dyspnea (e.g. congestive heart failure, pulmonary embolism, and pleural effusion) were excluded by computed tomography (CT) and echocardiography. Pulmonary hypertension seemed not causative for her symptoms, since peak systolic right ventricular pressure on echocardiography had decreased from 34 mmHg preoperatively to 31 mmHg. 6-minute walking distance (6-MWD) was 280 m, which was 70 m more compared to the preoperative value

Referral Pathway: Initially, the patient was assigned for a lung volume surgery. At this time, a bronchoscopic lung volume reduction was not recommended because of incomplete fissures and recurring exacerbations. BTVA was not available at this time. As after the LVRS symptoms slowly returned, she has been referred by thoracic surgery to Dr Franzen for the evaluation for BLVR.

Procedure

Basis of decision to treat with BTVA* (InterVapor®): Quantitative CT analysis using the software by Intervapor® revealed a slightly heterogeneous emphysema with interlobar fissure completeness between 69 and 92%. Due to upper lobe disease severity (proportion of voxels with density less than 950 HU) of 44% in LB1/2, a heterogeneity index of 1.2 between segment and ipsilateral lobe, and an estimated target volume of 233 ml, bronchoscopic LVR using bronchial thermal vapor ablation (BTVA) was possible. Seven months after unsuccessful LVR surgery, LB1/2 was treated with BTVA utilizing general anesthesia. Vapor was delivered for 7.2 seconds corresponding to 8.5 cal/g lung tissue using a properly positioned balloon catheter (InterVapor®) according to a recent best practice recommendation paper.

Six weeks after BTVA, the patient reported a significantly improved quality of life. Her exertional dyspnea has decreased to such an extent that she was able to expand her daily range of action to her fullest satisfaction and she often goes shopping and walking. The patient rarely uses continuous oxygen therapy because she does not longer needs it. The beneficial effects are lasting up to present (May, 2020)

IMAGES

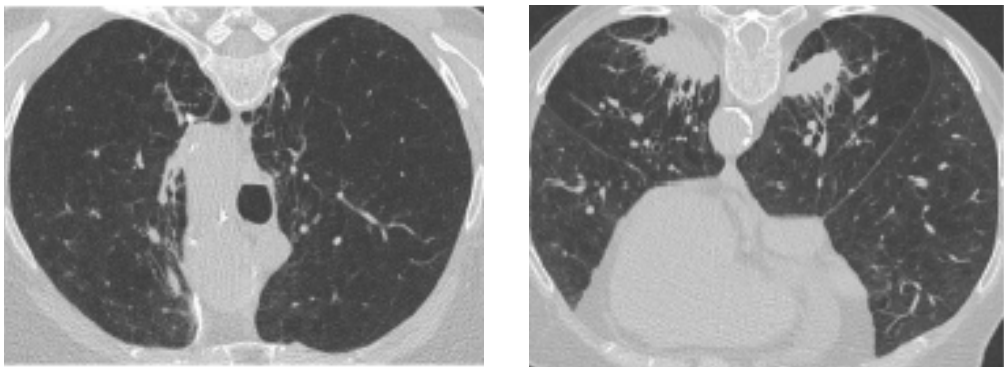

Figure 1: Chest computed tomography after LVRS and BTVA upper lobes (left) and right lower lobes (right)

PULMONARY FUNCTION CHANGES:

Pulmonary Function Tests and 6-min Walking Distance				
	Pre-LVR surgery	5 months after LVR surgery/ pre-BTVA	6 weeks after BTVA	6 months after BTVA
FVC, liters (% predicted)	1.60 (78)	1.52 (74)	2.06 (83)	2.23 (110)
FEV1, liters (% predicted)	0.68 (40)	0.65 (39)	0.97 (50)	1.10 (66)
FEV1/FVC TLC, liters (% predicted)	0.38 6.63 (164)	0.42 6.62 (164)	0.47 4.75 (117)	0.48 4.90 (121)
RV, liters (% predicted)	4.86 (282)	5.08 (295)	2.57 (148)	2.62 (151)
RV/TLC	0.73	0.77	0.54	0.54
TLCO (% predicted)	20	20	34	30
6-MWD, meters	210	280	325	420

CONCLUSION

PHYSICIAN PERSPECTIVE ON OUTCOMES: Bronchoscopic LVR, in particular BTVA, might be considered in patients with fading effects after previous successful LVRS. The safety profile of BTVA seems not to be adversely affected by previous LVRS, when proper patient selection and procedure planning are ensured.

Bronchoscopic Thermal Vapor Ablation (BTVA®) treatment included in the

2020 GOLD Guidelines

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