

Excessive Dynamic Airway Collapse

de Castro BR¹, Gérard L¹, Collienne C¹ and Hantson P^{1,2*}

¹Department of Intensive Care, Cliniques St-Luc, Université catholique de Louvain, Belgium

²Louvain Centre for Toxicology and Applied Pharmacology, Université catholique de Louvain, Belgium

*Corresponding author:

Philippe Hantson,
Department of Intensive Care, Cliniques
Universitaires St-Luc, Avenue Hippocrate, 10,
1200 Brussels, Belgium, Fax:32-2-7648928;
Tel: 32-2-7642755;
E-mail: philippe.hantson@uclouvain.be

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1. Clinical Image

A 71-year-old man underwent an elective liver transplantation for decompensated alcoholic liver cirrhosis. He had a medical history of Chronic Obstructive Pulmonary Disease (COPD) group B. In the pre-operative examination, spirometry had revealed: Forced Expiratory Volume (FEV-1), 2.18 L (69% of predicted value), forced vital capacity (FVC), 3.50 L (84%), Total Pulmonary Capacity (TPC) 8.13 L (116%), residual volume 4.55 L (176%), carbon monoxide diffusing capacity (DLCO), 17.80 ml/(min*mmHg) (70%). Obstructive disorder was not reversed by inhaled salbutamol. Surgery was not complicated but the weaning from the ventilator was difficult from the immediate post-operative period. The patient experienced multiple episodes of oxygen desaturation and bradycardia following expiratory obstruction. The condition was not improved by inhaled or intravenous bronchodilator therapy, but well by a major increase of inspiratory pressure together with sedative drugs and neuromuscular blockers. A partial weaning from the ventilator was achieved after tracheotomy. Fiberoptic bronchoscopy excluded tracheo-bronchomalacia but was fully consistent with an entity called "Excessive Dynamic Airway Collapse" (EDAC) (Video 1 Movie). Stenting of the trachea did not prevent new episodes of lower airways obstruction documented during fibroscopy. The patient had to be maintained under mechanical ventilation (BiPAP, EPAP + 17 cmH₂O, IPAP + 10 cmH₂O). Excessive Dynamic Airway Collapse (EDAC) is a distinct pathophysiologic entity from Tracheobronchomalacia (TBM) [1, 2]. It refers to an excessive anterior bowing of the posterior membrane into the airway lumen with intact cartilage and is associated with

conditions such as COPD, asthma, and obesity. The current reference standard for diagnosis is flexible dynamic bronchoscopy, while multidetector Computed Tomography (CT) with sequential imaging during inspiratory and expiratory phase may also be helpful. The current treatment usually includes silicone Y or uncovered self-expanding metallic stents placed in the trachea and bronchial tree under rigid bronchoscopy, but the technique does not totally prevent distal collapse.

References

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