Late onset of pneumothorax after bronchoscopic lung volume reduction due to migration of nitinol coil

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Introduction

Surgical treatments for end stage emphysema include lung transplantation and lung volume reduction surgery. However, limited indications and high morbidity and mortality preclude these procedures to most patients and alternative bronchoscopic techniques (BLVR) have been developed. Of the several treatment options described, nitinol coils have promising results and acceptable rate of complications. Unlike valves, coils do not appear to migrate or dislodge. Pneumothorax (PNX) is a known complication and it is usually due to sudden reduction of the lobe volume. We describe a late onset of tension PNX caused by a coil directly injuring the visceral pleura.

Case report

A 63-year-old woman affected by end stage heterogeneous emphysema underwent BLVR, with insertion of 10 nitinol coils in the upper right lobe. Four days later she presented at the emergency department with sudden onset of severe dyspnoea. Clinical evidence of PNX was confirmed by x-ray and a chest drain was inserted. Because of prolonged and consistent air leak, a video assisted thoracoscopy was performed showing the presence of a coil perforating the visceral pleura. The coil was easily removed and a wedge resection of the lung, including a sizable defect in the visceral pleura was performed. There was no post-operative air leak and the lung expanded completely. The drain was removed at postoperative day 3 and the patient was discharged.

Conclusions

PNX after BLVR is widely described. In case of valve placement, it can occur several days later, due to atelectasis of the treated lobe. However, coils do not cause atelectasis but they increase elastic recoil in the diseased lung by gathering and compressing lung parenchyma. They are available in different size, they are straightened for delivery into the target subsegmental airway under fluoroscopy, via a catheter, and regains its three-dimensional shape shortening the airway. Thus, PNX usually occurs immediately after the procedure due to quick shrinking of the lung parenchyma. In our case the PNX had a late onset, causing severe symptoms and the surgical exploration showed a large defect in the visceral pleura with a coil abutting the surface of the lung. All these evidences are in keeping with a migration of the coil which is never been described, to our knowledge. Surgical intervention was highly indicated and resolutive.

References

3. Zoumot Z, Kemp SV, et al. Endobronchial coils for severe emphysema are effective up to 12 months following treatment: medium term and cross-over results from a randomised controlled trial. PLoS One. 2015 Apr 8;10(4)