



Pulmonary herniation 3 years after video-assisted thoracic surgery lobectomy

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ABSTRACT

Pulmonary herniation is defined as protrusion of lung parenchyma through thoracic wall weakness. We present a case of a 69-year-old male who presented to a rural hospital with a 4-day history of cough, right-sided chest pain and exertional shortness of breath. His past medical history included right lung adenocarcinoma treated with right upper lobe lobectomy via video-assisted thorascopic surgery (VATS) 3 years prior. Chest inspection revealed decreased chest wall movements on the right side with no visible chest bulge and on palpation non-tender chest bilaterally with palpable crepitus of the right anterior chest. Chest expansion was reduced on the right side associated with hyper-resonant percussion. Auscultation revealed diffuse bilateral rhonchi. A CT of the chest showed herniation of the right lung through a post-operative defect in the thoracic wall. The patient was initiated on codeine linctus for cough suppression and remained haemodynamically stable for his 3-day admission. He remained asymptomatic at his 4-week follow up with complete resolution of surgical emphysema. We could find no other case reports of VATS lobectomy where lung herniation presented years after surgery.

KEYWORDS: Chest X-ray; cardiorespiratory health.

Case report

Our case was a 69-year-old male presenting with a 4-day history of cough with yellow sputum, right

anterior chest pain and mild exertional shortness of breath. His past medical history included chronic obstructive lung disease (COPD) and right lung adenocarcinoma (T2bN1M0) treated with right upper lobe lobectomy by video-assisted thorascopic surgery (VATS) 3 years ago. He was afebrile with a pulse rate of 56 beats/min, blood pressure of 105/50 mmHg and body mass index of 24.8. His respiratory rate was 18 breaths/min with 100% oxygen saturations on room air.

Chest inspection revealed a small longitudinal scar at the right third intercostal space anteriorly and decreased chest wall movements on the right side with no visible chest bulge. Palpation demonstrated central trachea and non-tender chest bilaterally, with palpable crepitus of the right anterior chest.

Chest expansion was reduced on the right side and tactile vocal fremitus detected on the right side. Percussion note was hyper-resonant on the right but

Table 1. Laboratory investigations at the time of patient admission

Hb (g/L)	147
WBC ($\times 10^9$ /L)	7.7
CRP (mg/L)	5.3
eGFR (mL/min/m ²)	>90
Creatinine (μ mol/L)	59
Urea (mmol/L)	6.5
Glucose (mmol/L)	7.0
ALT (U/L)	25
Alk Phos (U/L)	105
Albumin (g/L)	34
Bilirubin (μ mol/L)	4

Hb (haemoglobin); WBC (white blood cell count); CRP (C-reactive protein); eGFR (estimated glomerular filtration rate); ALT (alanine aminotransferase); Alk Phos (alkaline phosphatase).

normal on the left. Auscultation revealed diffuse bilateral rhonchi. Laboratory investigations are shown in Table 1. Chest X-ray demonstrated a small right pneumothorax and right-sided subcutaneous emphysema (Figure 1). A computerised tomography (CT) chest also showed herniation of the right lung through the post-operative defect in the thoracic wall (Figure 2). The patient was initiated on codeine linctus for cough suppression. Over the next 3 days, his symptoms resolved and he remained hemodynamically stable on room air. There was substantial resolution of surgical emphysema (Figure 3). His clinic follow up at 4 weeks showed complete resolution of subcutaneous emphysema.

Discussion

Pulmonary herniation is defined as protrusion of lung parenchyma through thoracic wall weakness. Spontaneous pulmonary herniations are rare and more commonly occur in patients with raised intrathoracic pressure such as patients with obesity or COPD.¹

Lung herniations can be classified by the anatomic location and the aetiology – congenital or acquired. Approximately 80% of reported cases are acquired and are subcategorized into spontaneous, pathological or traumatic, most being traumatic. They occur more frequently anteriorly in the inferior intercostal spaces because the muscular support is less and the costal cartilage spaces are wider there than in other thoracic wall regions. Patients typically present with chest pain secondary to coughing and a palpable bulge in the chest wall.²

The gold standard management for minimally invasive non-small cell lung cancer is VATS, which is associated with lower post-operative complication rates of pulmonary herniation than traditional thoracotomy.^{3,4} Fewer than 10 cases of lung herniation have been reported as complications of VATS procedures, with only two known cases reported following VATS lobectomy, both occurring within 1 month of the operation.^{5,6} Management can be either conservative or surgical. In cases where pain is persistent, operative repair is undertaken to prevent incarceration and strangulation, but no research has investigated long-term treatment outcomes.¹ Smoking cessation and weight reduction help decrease the risk of recurrence.²

Figure 1. Chest X-ray (on admission) demonstrating right-sided surgical emphysema and a small right-sided pneumothorax.

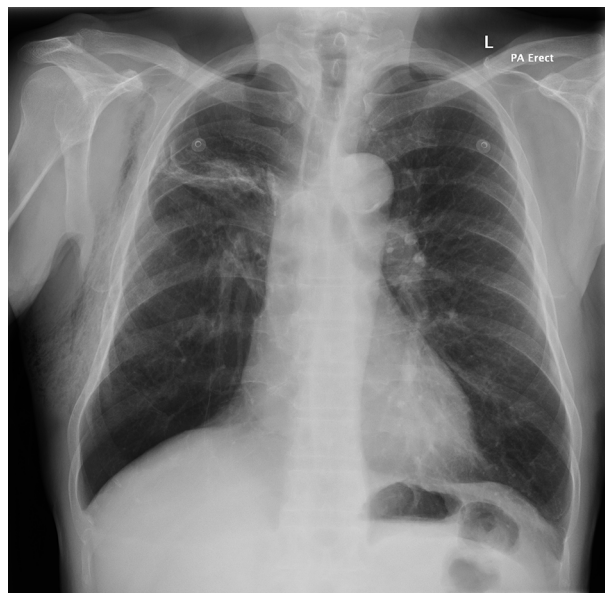
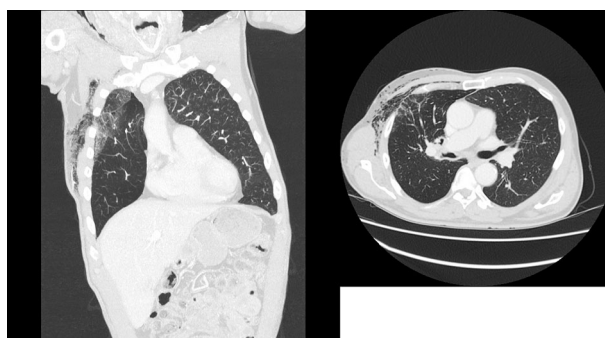


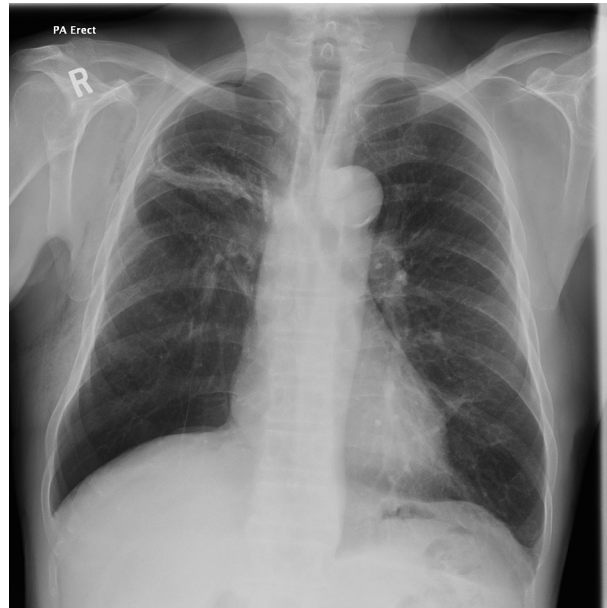
Figure 2. Coronal and axial computerised tomography scan demonstrating extensive right surgical emphysema and pulmonary herniation through the thoracic defect at the right third intercostal space. Post-surgical scarring and radiation fibrosis can be seen.



Our case presented with pulmonary herniation 3 years post VATS procedure. COPD was the added risk factor for this case. We could find no reports of other VATS lobectomy cases where lung herniation presented years after surgery. Moreover, this case is unusual because the patient's chest pain resolved 1 day after admission allowing his lung herniation to be managed conservatively.

To conclude, lung herniation is a rare presentation with few reported cases in the literature. General practitioners and physicians should keep lung

Figure 3. Chest X-ray (2 days post admission) demonstrating reduction in right-sided surgical emphysema.



herniation as a differential diagnosis in patients presenting with chest pain secondary to coughing, particularly for people with a history of previous thoracic surgery or trauma.

Competing interests

The authors declare no competing interests.

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References

1. Dahlkemper CL, Greissinger WP. Spontaneous lung herniation after forceful coughing. *Am J Emerg Med*. 2020;38(4):851.e5–6. doi:10.1016/j.ajem.2019.11.025
2. Scelfo C, Longo C, Aiello M, et al. Pulmonary hernia: Case report and review of the literature. *Respirol Case Rep*. 2018;6(8):e00354. doi:10.1002/rcr2.354
3. Jiang Y, Su Z, Liang H, et al. Video-assisted thoracoscopy for lung cancer: who is the future of thoracic surgery? *J Thorac Dis*. 2020;12(8):4427–33. doi:10.21037/jtd-20-1116
4. Batihan G, Yaldiz D, Ceylan KC. A rare complication of video-assisted thoracoscopic surgery: lung herniation retrospective case series of three patients and review of the literature. *Videosurgery Miniinv*. 2020;15(1):215–9. doi:10.5114/witm.2019.87937
5. Ishibashi H, Hirose M, Ohta S. Lung hernia after video-assisted thoracoscopic lobectomy clearly visualized by three-dimensional computed tomography. *Eur J Cardiothorac Surg*. 2007;31(5):938. doi:10.1016/j.ejcts.2007.01.041
6. Johnson C, Weksler B. Lung hernia after video-assisted thoracoscopic lobectomy. *Innovations*. 2010;5(4):300–2. doi:10.1097/imj.0b013e3181f0076a