CASE REPORT

Intermittent swelling in the chest; a case of spontaneous intermittent lung herniation

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SUMMARY

Herniation of the lung is uncommon and occurs due to protrusion of the lung beyond the confines of the thoracic cavity through an abnormal opening in the chest wall. Any condition associated with raised intrathoracic pressure or that which weakens the thoracic wall may result in lung herniation. We present a case of spontaneous lung herniation which was managed successfully by minimally invasive thoracic surgery.

BACKGROUND

Lung hernias are rare and occur due to a defect in the chest wall normally due to a rapid increase in intrathoracic pressure. They may present in different ways based on the individual symptomatology and can have a variable duration of onset. Approximately a fifth of them are congenital while the rest are acquired; of the latter a large proportion are due to traumatic aetiology. It is crucial to identify and manage lung herniation irrespective of the cause and duration to avoid complications.

CASE PRESENTATION

A 61-year-old retired builder, with no prior thoracic surgical intervention, was hospitalised with a 6-week history of right posterior chest wall pleuritic pain. His medical history included chronic obstructive pulmonary disease (COPD) on inhalers, mesh repair of paraumbilical hernia and fracture of the right malleolus. He was a current smoker with a 40-pack-year history. Two weeks after the onset of chest pain, he attended the emergency department. He was discharged with analgesia as his chest X-ray (CXR) was interpreted as normal (figure 1A). The pain got gradually worse and he was readmitted to the hospital with increasing breathlessness. He also complained of a new right posterolateral chest wall mass that appeared every time he coughed. There was no history of recent trauma, fever, chills, night sweats, weight change or haemoptysis. On admission he had a body mass index of 36, respiratory rate of 20 and oxygen saturations of 98% on air. Auscultation demonstrated decreased breath sounds over the right lung base with some

Figure 1 (A) Chest radiograph at first presentation to the hospital. The arrow shows that there may have been a subtle abnormality; however, this was interpreted as normal. (B) Chest radiograph at second presentation which did not demonstrate any abnormalities. (C) CT slice (transverse) showing the herniation (arrow). (D) CT slice (coronal) showing the herniation (arrow).

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tenderness over the posterior chest wall and a soft tissue defect of the chest wall which increased in size on expiration and moved inward with inspiration.

INVESTIGATIONS

His repeat CXR (figure 1B) looked normal with no rib fractures; however, CT scan of the chest revealed intercostal herniation of right lung between the eighth and ninth ribs (figure 1C, D) explaining his symptoms and physical findings.

TREATMENT

The patient was transferred to the cardiothoracic department for surgical correction of his intercostal hernia. This was conducted by superficial decompression of the hernia, stitching of the muscle layers and then insertion of a mesh to prevent recurrence of the hernia.

OUTCOME AND FOLLOW-UP

The patient had no postoperative complications reported at 15 months postsurgery follow-up.

DISCUSSION

Lung herniation occurs less commonly than diaphragmatic hernias with around 300 cases being reported.¹ Ronald¹ recorded the first case of lung herniation in 1499. However, the true incidence of lung herniation is difficult to estimate because of the minimal symptoms they produce and often patients affected do not seek medical attention as symptoms may be well tolerated. The Morel-Lavelle classification of lung hernias over a century ago is still widely accepted.^{2–3} Lung herniation may be classified according to anatomical location, cervical occurring in 35% of cases, intercostal in 60–83% and very rare diaphragmatic lung hernias. In 20% of cases the lung hernias are congenital while the rest which are acquired being further classified as pathological in 18% of cases (due to underlying diseases), spontaneous in 30% and traumatic in 52%^{2–5} (table 1).

Spontaneous lung hernias usually develop as a consequence of a sudden increase of intrathoracic pressure during coughing, sneezing, singing, blowing into a musical instrument or heavy lifting.^{6–7} There have been reports of cases presenting with various symptoms and duration of onset in adults.^{8–10} In our patient, the intercostal muscle tear may have occurred during an initial bout of coughing. The first and second CXRs were reported as normal hence suggesting that the lung herniation was intermittent. The analgesia prescribed probably improved the chest discomfort the patient was experiencing with the residual cough, due to underlying COPD, potentially aggravating the tear. Moreover the cough was most likely perpetuated due to pleural irritation resulting from the herniation.

Table 1 A representation of the Morel-Lavelle classification of hernias (anatomical and aetiological classifications)

Anatomical (%)	Aetiological (%)
Cervical (15–35)	Congenital (20)
Thoracic (60–83)	Acquired (80)
Diaphragmatic (2–5)	Pathological* (18)
	Spontaneous* (30)
	Traumatic* (52)

*Percentage of acquired lung hernias.

Spontaneous thoracic hernias are considered to be frequent in patients with COPD, presumably as a result of chronic coughing and hyperinflation combined with long-term steroid administration.¹¹ The role of the latter, although not established, may be relevant after a number of years of inhaled corticosteroid use. The diagnosis of lung hernia can usually be made on CXR (inspiratory and expiratory films), physical examination and confirmed with a CT scan. However in our case the CXRs were not diagnostic as there was no suspicion of lung herniation. Physical examination on admission and CT scanning were necessary in our patient. The management of lung hernias may be conservative or surgical. The former involves compression bandages and use of a corset, which may be appropriate in asymptomatic patients or in those in whom surgery is contraindicated. Follow-up is essential in patients opting for conservative management with further radiographic imaging if there are changes in the patient's symptoms or physical findings.¹¹ Surgical repair of thoracic hernias remains a matter of conjecture. It is unlikely for thoracic hernias to improve spontaneously and the risks of incarceration of strangulations may influence decisions regarding surgical repair. There are also suggestions that supraclavicular and hernias under the scapula require no treatment and those positioned anteriorly may require surgical intervention, even in the absence of any symptoms, to avoid extension into the abdominal wall.¹² Surgical intervention is recommended for patients with symptoms such as refractory pain, recurrent respiratory infections, haemoptysis or interference with daily activities of living. Surgical interventions depend on the location and size of the hernia and may include primary closure or synthetic mesh repair, which was the preferred option in our patient.¹³

Although lung herniations are rare, they can be easily missed, hence physicians should have some index of suspicion in patients with atypical chest pains and minimal respiratory pathology. With the advent of CT scanning, confirming or refuting this is relatively easy. Surgeons advise intervention for small defects as the risk of incarceration increases and makes reduction difficult but depending on the patient symptoms, comorbidities and their preferences, lung hernias can be managed conservatively or surgically.

Learning points

- ▶ Herniation of the lung is rare and can easily be missed, hence physicians should have some index of suspicion in patients with atypical chest pains and minimal respiratory pathology.
- ▶ On the basis of the patient symptoms, comorbidities and preferences, lung hernias can be managed conservatively or surgically.
- ▶ Follow-up is essential in patients opting for conservative management with further radiographical imaging if there are changes in the patient symptoms or physical findings.
- ▶ Surgeons advise intervention for small defects as the risk of incarceration increases and makes reduction difficult.
- ▶ Surgical intervention is recommended for patients with symptoms such as refractory pain, recurrent respiratory infections, haemoptysis or interference with daily activities of living.

Contributors UBL: registrar involved in the care of the patient; JAK, JBM: consultant physicians involved in the care of the patient; MC: cardio-thoracic consultant who operated on the patient. All authors were involved in writing up the case report.

Competing interests None.

Patient consent Obtained.

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