Spontaneous haemopneumothorax secondary to an aberrant lateral thoracic artery tear

Introduction

Spontaneous haemopneumothorax is a rare disorder that results from a torn small vessel in adhesions between the visceral and parietal pleurae resulting from the progress of lung collapse and continued air leak. Usually, spontaneous haemopneumothorax occurs in only 0.5–12% of cases of spontaneous pneumothorax. It can have dramatic consequences because of rapid progression and hypovolaemic shock.

Spontaneous haemothoraces have been most commonly reported as a result of torn pleural adhesion bands and ruptured vascularised bullae. Rupture of an apically located aberrant artery after pneumothorax has been reported as a more unusual cause of haemothorax. Spontaneous haemothorax as a result of subclavian arterial and posterior intercostal arterial rupture has been previously reported but spontaneous haemothorax as a result of an aberrant lateral thoracic artery tear has not been described. This article describes a rare case of spontaneous haemopneumothorax resulting from a tear in an aberrant lateral thoracic artery from a spontaneous pneumothorax.

Discussion

The lateral thoracic artery is a relatively large branch of the initial part of the internal thoracic artery. The course of this artery lies usually in the inner surface of the anterolateral thoracic wall; it constantly gives anastomotic branches

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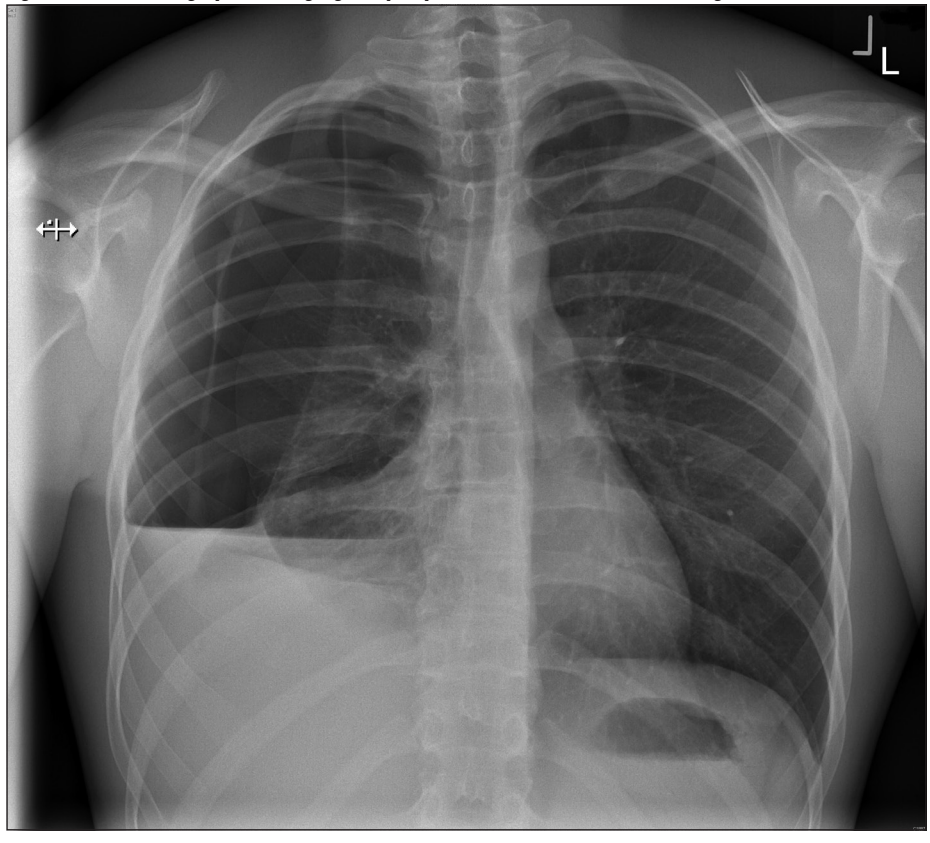
Figure 1. Chest radiograph showing right 'hydropneumothorax' with tethered lung.



Case Report

An 18-year-old man presented to accident and emergency with acute dyspnoea and right-sided chest pain. There was no history of trauma, premorbid illness or underlying lung disease. He had a 1-pack year smoking history including cannabis use. Clinical examination was significant for a sinus tachycardia of 120 beats/minute, respiratory rate of 22 breaths/minute, hypotension (96/55 mmHg), oxygen saturations of 94% on air, mild tracheal deviation to the right with decreased air entry and dull percussion at the right lung base, consistent with a right-sided hydropneumothorax, confirmed on the chest radiograph (*Figure 1*).

A 12 Fr chest drain was inserted for presumed hydropneumothorax. However, the drain effluent appeared bloody, did not clot and had a haematocrit of 29% (serum haematocrit 44%). A repeat chest radiograph confirmed adequate lung re-expansion and 1.7 litres of blood drained over the next 8 hours but at a rate below 200 ml/hour, the threshold for thoracotomy after having consulted with the on-call thoracic surgeon. Haemoglobin dropped from 13 g/dl on admission to 10 g/dl over 8 hours. An urgent computed tomography scan of chest with contrast was undertaken to localize the bleeding source. This showed a 'tethered lung' with an ill-defined focus of high density anteromedial to the right second rib, within the haemothorax, absent on the non-contrast scan. This was thought to represent a contrast blush indicating active extravasation (*Figure 2*). The chest drain position was satisfactory and as the effusion predated the drain on the first chest radiograph, the haemothorax was thought to be secondary to avulsion of the parietal pleura superiorly rather than being related to the inferior chest drain. The patient underwent urgent video-assisted thoracic surgery pleurectomy, apical bullectomy and ligation of a right accessory right lateral thoracic artery.

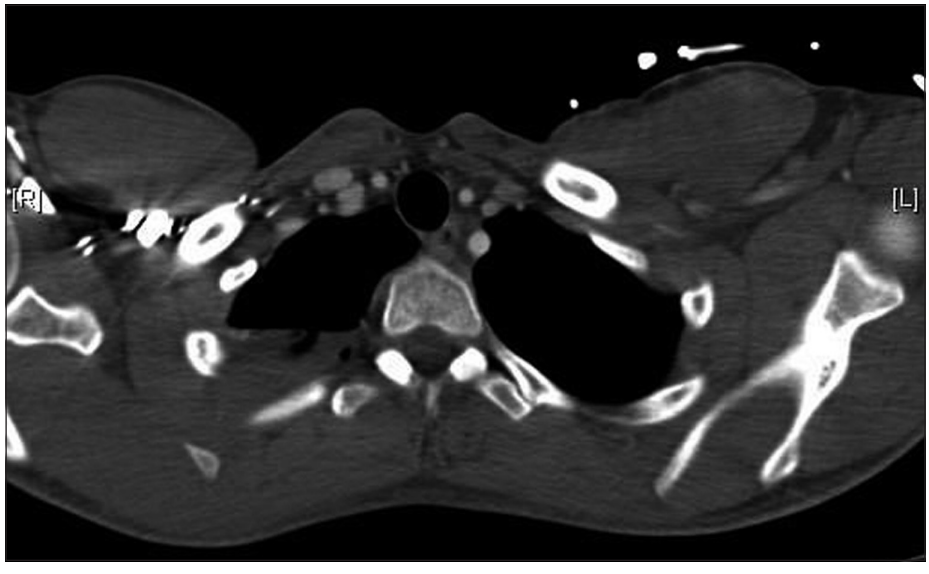
to the intercostal arteries. Owing to the topography and the relations of this artery it may be ruptured in a case of a fractured rib or chest drain insertion and result in a haemothorax (Nathan et al, 1982).

Spontaneous haemopneumothorax is rare, with a reported incidence of 0.5–12% among all cases of spontaneous pneumothorax (Hsu et al, 2005). Spontaneous haemopneumothorax usually occurs in young patients with a 30:1 male predominance probably related to smoking. Recurrence of spontaneous haemopneumothorax is extremely rare (Hsu et al, 2005), possibly because any residual intrapleural blood clots may cause pleurodesis preventing subsequent attacks. Following lung collapse from pneumothorax, haemorrhage may result from a torn congenital aberrant vessel, bleeding parietal pleura from torn adhesions between parietal and visceral pleurae, or bleeding visceral pleura from rupture of vascularized bullae or lung parenchyma. Systemic blood pressure of the vessel combined with the negative intrapleural pressure may lead to a potentially life-threatening haemothorax (Hart et al, 2002; Kim et al, 2008).

Treatment of spontaneous haemopneumothorax includes haemostasis and lung re-expansion via chest drain insertion initially to compress the torn vessels and to monitor blood loss. Early thoracic surgical involvement is essential. Thoracotomy is indicated for hypovolaemic shock, persistent bleeding (>3 ml/kg/hour), persistent air leak, impaired lung expansion, pachypleuritis or persistent pneumothorax (Kakaris et al, 2004). In the present case, although the drainage was 1.7 litres over 8 hours for the most part it was <200 ml/hr apart from a couple of readings which were thought to be postural variations.

Short-term and long-term outcome of spontaneous haemopneumothorax is directly related to the underlying cause. Complications include death from tension pneumothorax or hypovolaemic shock from haemothorax and also complications from any surgery such as pain, infection, empyema and persistent pneumothorax from failure of complete lung re-expansion. Surgery may involve clot evacuation, resection of bullae, ligation or embolization of bleeding adhesions, irrigation of the pleural cavity and decortication. Video-assisted thoracic surgery is strongly advocated and may be better than thoracotomy because of reduced postoperative pain and shortened hospital stay (Wu et al, 2002). BJHM

Figure 2. Computed tomography of thorax with contrast (mediastinal windows) showing contrast blush anteromedial to right second rib indicating active extravasation.



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LEARNING POINTS

- A large spontaneous haemopneumothorax is unusual and may be life-threatening.
- Late recognition and delayed intervention can increase mortality rate.
- Tear of an aberrant artery should be considered as a cause.
- Urgent computed tomography before insertion of the chest drain is usually recommended.
- Early discussion with a thoracic surgeon is essential and video-assisted thoracic surgery is the favoured surgical approach.