Case report - Thoracic general

Acute massive haemopneumothorax due to solitary costal exostosis

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Abstract

Acute massive haemopneumothorax is frequently related to open or blunt chest trauma, whereas spontaneous haemopneumothorax is rare and may be due to multiple hereditary exostosis (MHE). We report a case of acute massive spontaneous and relapsed haemopneumothorax occurring during a volleyball match, and caused by solitary costal exostosis. Thoracoscopy failed to disclose and remove the cause of the haemopneumothorax and so the patient underwent thoracotomy for costal resection and lung parenchyma suture.

Keywords: Haemopneumothorax; Costal exostosis

1. Introduction

Massive acute haemopneumothorax is commonly due to open or blunt chest trauma whereas spontaneous haemopneumothorax is rare and usually the result of pneumothorax complicated by bleeding due to rupture of bullae or adhesions.

We report a very rare case of apparently acute spontaneous haemopneumothorax occurring in an athlete during a volleyball match. So-called ‘one through’ pleuroscopy performed by pneumologists disclosed only a large clot but failed to show the cause of the bleeding.

As widely discussed in the literature, the first step in acute haemopneumothorax treatment is percutaneous tube thoracostomy (PTT) [1,2]. Video-assisted thoracoscopic surgery (VATS) very often discloses the cause of bleeding but sometimes thoracotomy is required, as in our case [3–5].

2. Case report

A 36-year-old male volleyball player was admitted to the Emergency Department of another hospital for acute dyspnoea and right chest pain during a volleyball match. Chest X-ray disclosed right hydropneumothorax, treated by percutaneous tube thoracostomy; 1700 cc of sero-haematic fluid was drained and 4 days later the patient was discharged. Three months later the patient had acute right chest pain without dyspnoea. He was admitted to another hospital where a chest X-ray and computed tomography (CT) scan disclosed only massive right haemothorax but failed to provide any useful information on bleeding origin (Fig. 1).

Pneumologists performed ‘one through’ pleuroscopy and drained the hemithorax but could not find the cause of bleeding because only a large clot was visible on the right hemidiaphragm.

The patient was transferred to our department where another CT scan disclosed giant costal exostosis (2.5 cm) pricking the lower lobe of the right lung (Fig. 2, black arrow). Admission tests showed Hb: 12.2 g/dl; WBC: 16 300/μl; PLT: 499 000; pO2: 119 mmHg; pCO2: 40.9 mmHg; Sat O2: 98.6. The patient reported no known chest trauma and underwent right thoracotomy; after pulmonary adhesiolisis, the large clot on the diaphragm was removed, the IXth rib and its giant costal exostosis was resected and the lower lobe sutured.

Histological examination of the exostosis showed medullary oedema and fibrosis, neoangiogenesis like bone remodelling, suggestive of an old fracture. The patient was discharged 10 days after surgery in good general condition.

3. Discussion

Non-traumatic or spontaneous haemothorax is a rare condition, sometimes occurring during anticoagulant...
therapy, in patients with bleeding disorders, or as a complication of spontaneous pneumothorax, pleural malignancy or rupture of thoracic aortic aneurysm [6]. Costal exostosis also causes haemothorax due to direct traumatic injury of the pleura or diaphragm by an intrathoracic tumour.

Two broad types of costal exostosis are usually encountered:

- **Hereditary multiple exostosis (HME),** an autosomal dominant condition characterized by multiple exostoses, usually seen in the long bones
- **Solitary costal exostosis (SCE)**

Haemothorax is a rare complication and has only been described in eight patients (six HME and two SCE) to date [6,7].

The aetiological mechanism proposed is shearing of the pleura, lung and diaphragm by the sharp margins of the intrathoracic exostosis. Recently, Uckida et al. Proposed another aetiological mechanism, consisting in focal pleural changes induced by long-standing friction between the intrathoracic exostosis and the visceral pleura due to respiratory motion, so that spontaneous rupture of the dilated vessels might result in haemothorax [6].

The rarity of our case consists not only in the haemothorax caused by a solitary costal exostosis, in itself a rare event, but also the young age of the patient and the athletic activity causing apparently spontaneous perforation of the lung.

We conclude that, albeit rare, hereditary multiple exostosis or solitary costal exostosis should be entertained in patients presenting non-traumatic haemothorax without coagulopathy.

**References**