Rare disease

Spontaneous haemopneumothorax

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An 18-year-old man presented with a 2 day history of breathlessness and left-sided chest pain, with no preceding trauma. He had no medical history of note, and had never smoked. He was in hypovolaemic shock, with Hb of 8.1 g/dl, and received fluid resuscitation. Chest x-ray (CXR) revealed left-sided hydropneumothorax, with the effusion of blood-consistency on CT thorax. Tube thoracostomy drained 1.7 litres of blood immediately. He remained haemodynamically stable after 4 units of blood transfusion on the first day with post-transfusion Hb 11 g/dl. Following cardiothoracic surgeon advice, tube was removed on day 5 draining total of 3.5 litres, with good response clinically and radiologically. Patient was well when followed up at 1 week after hospital discharge, with no recurrence and complete re-expansion of left lung on CXR.

BACKGROUND

Most cases of haemopneumothorax are related to open or closed chest trauma or procedures such as central line insertion, thoracocentesis, pleural biopsy or catheterisation.

Spontaneous haemopneumothorax (SHP) is rare, with an incidence rate of 2–7.3% in patients with spontaneous

pneumothorax, according to a recent systemic review.¹ It is defined as >400 mls of blood in the pleural cavity in association with pneumothorax without any preceding trauma.¹ Prompt recognition of the condition and involvement of cardiothoracic team are essential; with fluid resuscitation, tube thoracotomy and surgery being the mainstay of treatment.

Figure 1 Chest x-ray revealed air-fluid level in the left hemithorax.

Figure 2 (A,B) CT chest shows left-sided pneumothorax but no air in mediastinum.

CASE PRESENTATION

An 18-year-old Caucasian man presented to accident and emergency department in December 2010, with a 2 day history of sudden onset left-sided pleuritic chest pain, associated with breathless on minimal exertion. He had collapsed on two occasions before admission. The week before admission he had gastroenteritis and vomited several times. He did not have any similar episodes in the past. He denied any trauma to the chest and there was no history of recent air travel or scuba diving. He has never smoked nor used illicit drugs. There was no medical history of note and he was not on any regular medication. His uncle, a heavy smoker, has had previous pneumothoraces; his father suffered with asthma. Patient was known to be allergic to plaster.

On examination he was tachypneic at rest with respiratory rate of 28/min. Oxygen saturation was 96% on room air at rest. He was tachycardic at 104/min, with

blood pressure of 96/55. Respiratory examination revealed decreased breath sound on the left hemithorax, with hyper-resonance on percussion over the left upper chest and dullness to percussion at the left base. Trachea was central. Abdomen was soft and non-tender with normal bowel sounds. There was no surgical emphysema clinically. Rest of the physical examination was unremarkable.

INVESTIGATIONS

A chest x-ray (CXR) showed air-fluid level on the left hemithorax (figure 1). His initial blood tests show normocytic anaemia with Hb 8.1g/dl, and a normal clotting screen. Urea and electrolytes, and liver function tests were normal. He was cross-matched and received intravenous fluids prior to blood transfusion.

He was referred to the medical team for further management of the spontaneous hydropneumothorax. A CT chest scan was obtained 4 h after admission, and showed

Figure 3 Chest x-ray shows resolution of the left pneumothorax and small pleural effusion.

left-sided pneumothorax with a large left pleural effusion which contains high density changes at the left lung base most consistent with haemorrhage. There was no air in the mediastinum (figure 2).

TREATMENT

A 28F chest drain was inserted on the advice of cardiothoracic surgical team at tertiary centre, with 1700 mls blood drained immediately. He remained haemodynamically stable with a post-transfusion Hb of 11.5 g/dl. He was put on suction of up to -10kPa due to persistent small apical pneumothorax on serial chest radiographs.

On day 3 of admission he spiked temperature of 38.3°C. CXR did not show any worsening pleural effusion, drain site was clean. He did not have any respiratory symptoms. C-reactive protein was 19 (from admission count of 5). He was given oral amoxicillin, with no further spiking of temperature.

OUTCOME AND FOLLOW-UP

Cardiothoracic surgeons were consulted throughout his care. The thoracostomy tube drained total of 3.5 litres before it was removed on day 5. Post drain-removal CXR showed small apical pneumothorax, and he was discharged on day 6. He was advised about the risks associated with smoking, flying and diving.

On a follow-up visit to chest clinic 1 week after discharge from hospital, he remained well. CXR showed resolution of left-sided pneumothorax, with a small pleural effusion (figure 3). In the absence of respiratory or systemic symptoms, a conservative approach with x-ray surveillance was favoured.

DISCUSSION

SHP is a rare entity and usually occurs in young patients with a 30:1 male predominance.² Following collapsed

lung from pneumothorax, haemorrhage may result from torn congenital aberrant vessel; or bleeding parietal pleura from torn adhesions between parietal and visceral pleurae; or bleeding visceral pleura from rupture of vascularised bullae or lung parenchyma.¹ Systemic blood pressure of the vessel combined with the negative intrapleural pressure may lead to a potentially life-threatening intrapleural haemorrhage.

In our case, the patient collapsed twice prior to presentation most likely as a result of his hypovolaemic state from intrapleural haemorrhage.

The cause of his SHP remains unknown. He does not have any identifiable risk factors for pneumothorax as he is a non-smoker, and does not have signs suggestive of underlying connective tissue disease. Although genetic factors have been implicated in spontaneous pneumothoraces,^{3 4} there is no cystic changes identified in his CT scan, and his uncle's secondary pneumothoraces may not be a significant family history.

Currently there are no guidelines on management of SHP. Case studies and meta-analyses have described tube thoracotomy and thoracocentesis as initial treatment alongside fluid resuscitation.⁵ Early involvement of cardiothoracic surgeons is essential.

For traumatic haemothorax, thoracotomy is indicated, according to Advanced Trauma Life Support guidelines, if there is ≥ 1500 ml of blood immediately evacuated or ≥ 200 ml/h drainage of blood for 2–4 h, taking into account patient's physiological status and/or persistent blood transfusion requirements.⁶

For SHP, one review suggested that thoracotomy is indicated if there are signs of hypovolaemic shock, continuous bleeding (>100 ml/h), persistent air leak, impaired lung expansion, pachypleuritis, or persistent pneumothorax.⁷ Surgery may consist of clot evacuation, resection of bulla, ligation of bleeding adhesion, irrigation of pleural cavity and decortication.⁷

Video-assisted thoracic surgery (VATS) is strongly advocated for management of SHP, and may be superior to thoracotomy due to lessened postoperative pain, shortened hospital stay and consequent reduced hospital cost.^{1 7–9}

In our case, a conservative approach with chest drain was favoured, as haemostasis was achieved early. Nevertheless cardiothoracic surgeons were closely involved throughout the patient's care.

Complications of SHP include death from tension pneumothorax or hypovolaemic shock from haemothorax; that related to the procedure(s) or operation(s) done such as pain, infection, empyema, persistent pneumothorax from failure of complete re-expansion of lung.

Recurrence of SHP is extremely rare; with none reported in a systemic review of 201 patients.¹ It was suggested that the minimal residual blood clots remaining in the pleural cavity may have caused pleurodesis, preventing subsequent attacks.¹

In summary, spontaneous haemopneumothorax is rare; Prompt diagnosis is vital to aid management and to avoid fatal complications. There are currently no guidelines on management; with VATS being favoured as the surgical approach after basic resuscitation and supportive treatment.

Learning points

- ▶ Spontaneous haemopneumothorax is rare;
- ▶ Prompt diagnosis is vital to aid management and to avoid fatal complications.
- ▶ There are currently no guidelines on its management; with VATS being favoured as the surgical approach after basic resuscitation and supportive treatment.

Competing interests None.

Patient consent Obtained.

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