

Spontaneous Hemopneumothorax Secondary to Rupture Bullae

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Abstract

Spontaneous hemopneumothorax is a rare entity. It is a sub-category of hemothorax which involves the accumulation of blood in the pleural space in the absence of trauma or other cause. Patient may present with rapid deterioration of symptoms and lead to life threatening condition due to haemorrhagic shock. Late recognition and intervention may increase the mortality rate. Urgent measure of resuscitation and decision of surgery to stop the bleeding need to be performed to save the patient. Surgery should be considered early in managing this patient to reduce the mortality and morbidity that is due to uncontrol bleeding and also inadequate drainage by the chest drain. In current years, the use of video assisted thoracoscopy (VATS) in managing acute cases has less postoperative complications and reduced hospital stay compared with thoracotomy.

Keywords: Spontaneous Hemothorax; Uniportal VATSs

Introduction

Acute hemothorax is a life-threatening situation usually caused by trauma, iatrogenic reasons like central line insertion or due to coagulopathy. Spontaneous hemothorax is a subset of hemothorax, which is rare. Spontaneous haemopneumothorax (SHP) was first described by Laennec in 1828 in which it was diagnosed during post-mortem. Subsequently in 1876, there was a successful treatment of spontaneous haemopneumothorax performed by Whitaker was reported [1]. Following this, spontaneous haemopneumothorax has become a well-documented condition that is associated with 1 - 12% of all pneumothorax [2,3]. Based on literature, 80 - 100% of patients with SHP present with their episode of pneumothorax, while 10 - 12% had recurrent ipsilateral pneumothorax and 10% have had previous contralateral pneumothorax [2-5]. We report a case of an 18 year old man who presented with spontaneous hemopneumothorax who underwent uniportal video assisted thoracoscopic surgery (U-VATS).

Case Report

An 18 year old man presented with sudden onset of shortness of breath while playing basketball associated with left sided chest pain. He denied trauma or fall while playing basketball. He is not a smoker.

On arrival to emergency department, he was alert with blood pressure 110/68 mmHg and pulse rate of 82 with pain score of 6/10.

After an hour, he developed tonic clonic seizure which lasted for 10 seconds and aborted spontaneously. During this fitting episode, he became hypotensive and tachycardic (BP: 49/28 mmHg and pr: 129). He was resuscitated and noradrenaline infusion started.

Chest X-ray noted left sided hemopneumothorax. Left sided chest tube was inserted and drained out 2 litres of blood. He was transfused with 6 pints of pack cells and 1 cycle of DIVC regime. A CT angiogram thorax showed active contrast extravasation at the left apical region however unable to delineate source of bleeding. Right apical bullae was also seen.

Figure 1: CT thorax showed left hemothorax.

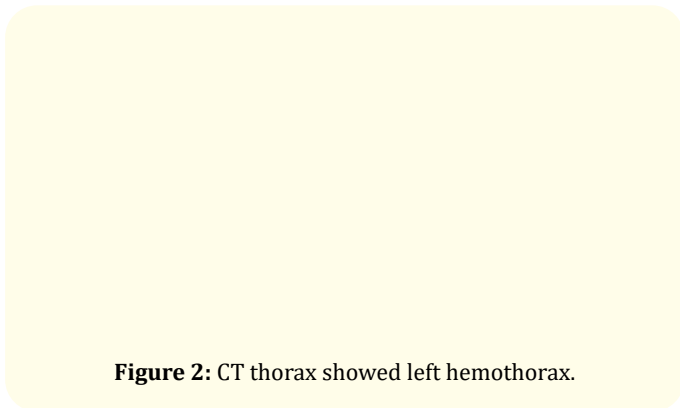


Figure 2: CT thorax showed left hemothorax.

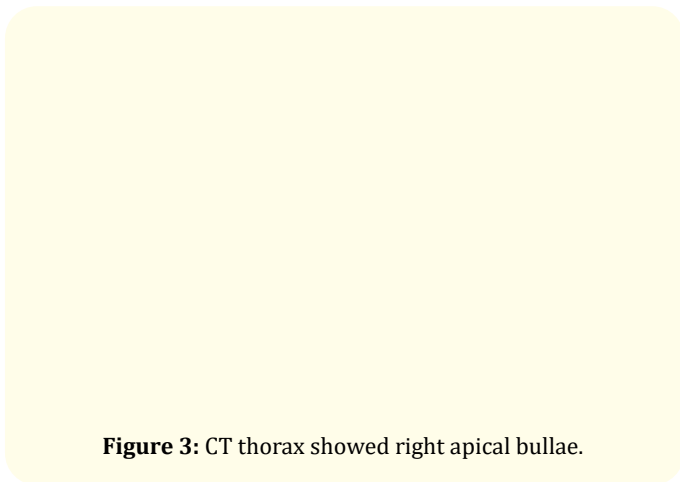


Figure 3: CT thorax showed right apical bullae.

Subsequently he underwent left U-VATS exploration. Intraoperatively evacuated 1.2 litres of blood clot. Patches of raw area with suspicious of ruptured bullae seen at the left apical segment. Bullectomy and pleurodesis was performed. Postoperatively, left lung was well expanded, and he was discharged on day 4 of surgery. HPE result showed ruptured bullae with blood vessels within the bullae.

Discussion

Spontaneous hemothorax is defined as pleural fluid hematocrit greater than 50% of the peripheral blood hematocrit and the absence of natural or iatrogenic trauma affecting the lung or pleural space. Patrini, *et al.* summarizes the aetiology of spontaneous hemothorax as below [6].

Etiology of spontaneous hemothorax

Among all the causes of hemothorax, spontaneous haemopneumothorax is commonest. About 5% of patients with pneumothorax will have concomitant haemothorax due to the shearing of the adhesions between the parietal and visceral pleura, rupture of a vascularized bullae or due to small non-contractile aberrant vessel between parietal pleura and bullae [7,8]. When a

Category	Etiology
Pneumothorax	Spontaneous hemopneumothorax
Coagulopathy	Congenital disease (hemophilia, glanzmann thromboastenia)
	Drug related
Vascular	Arteriovenous malformation
	Von Recklinghausen disease
	Aneurysms
	Ehler Danlos syndrome type IV
	Connective tissue disease
Neoplasia	Angiosarcoma
	Schwannoma
	Thymoma
	Vascular tumors
	Germ cell tumors
	Hepatocellular carcinoma
	Lung cancer
	Mesothelioma
Miscellaneous	Exostoses
	Extramedullary hematopoiesis
	Endometriosis
	Pulmonary sequestration

Table

bullae rupture, pneumothorax will develop causing lung collapses and lead to tearing of the pleural adhesion. In this condition, small calibre vessel may bleed profusely causing massive blood loss because as the lung collapses it will generate a negative pressure hence there is no structure to provide a local tamponade to the bleeding vessel [5]. Tatabe S., *et al.* has reported that the vascular wall of this aberrant vessel is lack of normal smooth muscle so that the normal mechanism of contraction and retraction during bleeding are inhibited [2]. In our case, we suspect that the bullae had rupture causing pneumothax and shearing of the pleura and bleeding from aberrant vessel. Due to lack of tamponade it has cause massive bleeding and our patient went into hemorrhagic shock.

In the case of spontaneous hemopneumothorax, patient’s condition may deteriorate immediately as there is no tamponade from the lung due to the presence of the pneumothorax while blood is accumulating in the pleural space. This will lead to hypovolaemic shock, which happened to our patient. Thus, immediate resuscitation with fluids and blood product are required. Drainage of the hemothorax with tube thoracostomy is also required for re-expansion of the lung [6].

A retrospective study by Chang, et al. found that early intervention with VATS in patient with spontaneous hemopneumothorax had less preoperative blood loss, less transfusion, shorter length of hospital stay and in long term will avoid the risk of developing empyema and impaired lung re-expansion [9]. In our case, this patient was subjected to left U-VATS exploration, evacuation of blood clot, resection of bullae and pleurodesis.

The most important goal of U-VATS is the decrease of post-operative pain due to a single incision without rib spreading. A study by Jutley, et al. [10] reported that VATS treatment of pleural has lower median pain score if compared with 3-port VATS and 86% of uniportal VATS patients reported no long-term neurologic symptoms, while only 42% were asymptomatic in the 3-port group. Tamura, et al. [11] presented similar results in their series of 37 patients with the pain score significantly better for patients undergoing single incision VATS.

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