EMERGENCY CASEBOOK

Spontaneous massive haemothorax caused by rupture of an intercostal vein

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Spontaneous massive haemothorax is rare. We describe a healthy 44 year old woman who experience sudden onset chest pain while sleeping. Chest radiograph revealed massive right pleural effusion. Progressive dyspnoea, cold sweating, and tachycardia developed later. A tube thoracostomy was performed immediately and massive haemothorax was noted. An emergency thoracotomy was performed because of unstable vital signs. Disruption of the right third intercostal vein with continuous bleeding was observed, and suture ligation of the vein was performed. The total blood loss was about 4000 ml. The patient recovered uneventfully, and her condition at follow up visits to the outpatient department was satisfactory.

Spontaneous haemothorax is a rare condition. Known causes include tumour, anticoagulant therapy, arteriovenous malformation, pulmonary emboli, and tuberculosis.¹ Tube thoracostomy drainage to evacuate unclotted blood and monitor bleeding is the first consideration in cases of haemothorax.² Surgical intervention is indicated if the haemodynamic status is unstable or if there is continuous blood loss.³ To our knowledge, only one case of spontaneous haemothorax without associated illness or injury has been reported.⁴ We report a patient with spontaneous massive haemothorax caused by rupture of the intercostal vein with active bleeding.

CASE REPORT

A healthy 44 year old woman presented to our emergency department complaining of sudden onset of pain in the right chest while sleeping. The initial chest radiograph revealed massive pleural effusion in the right hemithorax (fig 1). Progressive dyspnoea, cold sweating, tachycardia (128 beats/min), and low systolic blood pressure (<80 mmHg) developed subsequently. Blood analysis revealed haemoglobin 9.1 g/dl, haematocrit 27.5%, and platelet count 69 000/ μ l. The prothrombin and partial thromboplastin times were normal (international normalised ratio 1.06). A contrast enhanced computed tomography scan of the chest revealed massive pleural effusion in the right hemithorax with no evidence of a focal lesion. A tube thoracostomy was performed immediately and about 1500 ml of fresh blood was evacuated. The haematocrit of the pleural fluid was 21%. Body fluid resuscitation with blood transfusion was performed. An emergent right posterolateral thoracotomy was performed via the fifth intercostal space because of the patient's unstable haemodynamic status and massive bleeding. Disruption of the third intercostal vein with continuous bleeding was observed. Suture ligation of the vein and biopsy of the venous wall were performed. The parenchyma of the lung was normal and no aberrant vessels were detected. We evacuated about 2500 ml of a mixture of fresh and clotted blood during

the operation. A 32Fr chest tube was introduced at the end of the operation. Pathological examination revealed degenerative changes of the vascular wall, but there was no evidence of malignancy or arteriovenous malformation. The patient recovered uneventfully and was discharged after 6 days in hospital. On follow up visits to the outpatient department, her condition was satisfactory.

DISCUSSION

Spontaneous haemothorax is uncommon. Haemothorax in the absence of illness or injury is extremely rare. The only previous report of spontaneous haemothorax⁴ concerned an otherwise healthy young man with a small rent in his diaphragm. There are no previous reports of idiopathic rupture of the intercostal vein causing massive haemothorax. Haemothorax is defined as a bloody pleural effusion in which the haematocrit of the pleural fluid is $\geq 50\%$ of that of peripheral blood.⁵ The aetiology of spontaneous haemothorax includes pleural or pulmonary neoplasms, coagulation disorders, arteriovenous malformation, aortic dissection, pulmonary emboli, endometriosis, and infectious haemothorax.¹ In our case, there was no evidence of any of these conditions, and a previous history of trauma was excluded. There was no evidence of bleeding diathesis from laboratory analyses, and no haemostatic problems were encountered during the operation. There was no evidence of vascular malformation or thrombosis during the pathological examination. When spontaneous haemothorax occurs in a healthy patient and no significant focal lesions or haematological disorders are

Figure 1 Chest radiograph, anteroposterior view, showing massive fluid accumulation in the right pleural cavity.

found, spontaneous rupture of the vessels should be considered. Spontaneous rupture of systemic veins such as the basilican⁶ and umbilical vein,⁷ which cause haemoperitoneum, have been reported. Twenty cases of spontaneous rupture of the iliac vein have been reported,⁸ most of which were complicated by deep vein thrombosis. Local venous hypertension caused by deep vein thrombosis and venous wall weakness secondary to thrombophlebitis are considered to cause spontaneous vein rupture.⁸

Management of spontaneous haemothorax is based on principles developed for management of traumatic haemothorax.³ Unless the haemothorax is minimal and does not increase, tube thoracostomy is the initial management option of choice.² It has the following advantages: it provides an index of intrathoracic bleeding; it facilitates maximal evacuation of non-clotted blood from the pleural space; and the blood that is collected can be used for autotransfusion.² Indications for thoracotomy include acute deterioration and haemodynamic instability (blood pressure <80 mmHg), and an initial chest tube output of 1500 ml blood or continued bleeding in excess of 200 ml/hour.³ Video assisted thoracic surgery could be considered for treatment of haemothorax in patients with stable vital signs, but thoracotomy should be performed when haemodynamics are unstable. Emergency thoracotomy was performed on our patient in accordance with these criteria. Her condition deteriorated initially, but recovered after resuscitation and surgical intervention to halt the bleeding.

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REFERENCES

- 1 **Cheng YL**, Yu CP, Hsu SH, *et al*. Hemangiopericytoma of the pleura causing massive hemothorax. *J Formos Med Assoc* 2000;**99**:428–30.
- 2 **Panagiotis N**. Acute traumatic hemothorax. *Ann Thorac Surg* 1978;**26**:195–6.
- 3 **Fernando JM**, Andrew GV, Robert P, *et al*. Spontaneous hemothorax: Report of 6 cases and review of the literature. *Medicine* 1992;**71**:354–68.
- 4 **Robert OS**, Joseph RR. Spontaneous hemothorax in an otherwise healthy young man. *Chest* 1974;**66**:81–2.
- 5 **Light RW**. Hemothorax. In: *Light RW. Pleural diseases*. 2nd edn. Philadelphia: Lea & Febiger, 1990:263–7.
- 6 **Ranero A**, Fregoso M. Spontaneous basilica vein rupture. *Am J Emerg Med* 2004;**22**:431–3.
- 7 **Vallalta Morales M**, Cano B, Morata Aldea C, *et al*. Hemoperitoneum secondary to spontaneous rupture of the umbilical vein. (In Spanish.) *Gastroenterol Hepatol* 2004;**27**:414–16.
- 8 **Yasuga Y**, Hayashi N, Nagai Y, *et al*. Spontaneous rupture of the iliac vein. *Can J Surg* 2004;**47**:471.