



Large extrapleural hematoma in an anticoagulated patient after a thoracic blunt trauma



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Introduction

Extrapleural hematoma is a rare and life-threatening condition characterized by a collection of blood between the pleura parietalis and the endothoracic fascia. It may occur after the fracture of a thoracic vertebra (6), a spontaneous aortic rupture (2), or invasive procedures such a central catheter placement (5), thoracostomy (1), or sympathectomy (5), but can also develop from an acute blunt trauma of the chest wall with rib fractures (3,4,7,8). Related symptoms and chest x-ray findings are not characteristic and may present several hours after the injury, leading to delayed diagnosis and treatment. We report a case of a fatal traumatic extrapleural hematoma that developed in an anticoagulated patient with rib fractures and required an emergency surgical treatment.

Case Report

A 72-year old man presented at our emergency department for severe dyspnea and right chest pain. Four days earlier he had fallen from a 1-meter height. Two days after trauma, he presented at an emergency room of another institution because of mild chest pain. Chest x-ray revealed the presence of 7th and 8th right rib displaced fractures, but the patient refused hospitalization. Past

Riassunto

EMATOMA EPIPLEURICO POST-TRAUMATICO

Gli autori riportano un caso di imponente ematoma extrapleurico insorto in un paziente anticoagulato, in seguito ad un trauma chiuso del torace e alla frattura di diverse coste, che ha richiesto un trattamento chirurgico d'emergenza. L'ematoma extrapleurico è una condizione rara, ma pericolosa per la vita, caratterizzata da una raccolta di sangue tra la pleura parietale e la fascia endotoracica. I sintomi ed il quadro radiologico sono spesso aspecifici e si possono manifestare a distanza di parecchie ore dal trauma, rendendo la diagnosi ed il trattamento tardivi. Infine, vengono brevemente discusse alcune implicazioni eziologiche, terapeutiche e prognostiche dell'ematoma epipleurico.

Parole chiave: Trauma chiuso del torace, ematoma epipleurico, frattura costale, terapia anticoagulante.

Abstract

We report the 7th case of a traumatic extrapleural hematoma that developed in an anticoagulated patient with a thoracic blunt trauma and rib fractures, and required an emergency surgical treatment. Extrapleural hematoma is a rare and life-threatening condition characterized by a collection of blood between the pleura parietalis and the endothoracic fascia. Related symptoms and chest x-ray findings are not characteristic and may present several hours after the injury, leading to delayed diagnosis and treatment. Etiological, surgical and prognostic implications of this finding are briefly discussed.

Key words: Thoracic blunt trauma, epipleural hematoma, rib fracture, anticoagulation therapy.

medical history included a mitral and aortic valve replacement requiring a chronic anticoagulation therapy. On the primary survey the patient was found alert, pale, diaphoretic and in moderate respiratory distress. His upper airway was clear. Trachea was midline and jugular veins were flat. Vital signs were blood pressure 80/50 mmHg, pulse 160 beats/min and respiratory rate 36/min. Palpation of the chest revealed bony crepitation over the 7th and 8th right ribs at the midaxillary line. Decreased



Figure 1: Portable posterior-anterior chest x-ray (bedside) shows a diffuse opacity of the right hemithorax.



Figure 2: Thoracic CT scan shows a blood collection posterior to the compressed right lung. The thoracostomy tube is anterior to enhanced and thickened parietal pleura and extrapleural fat.

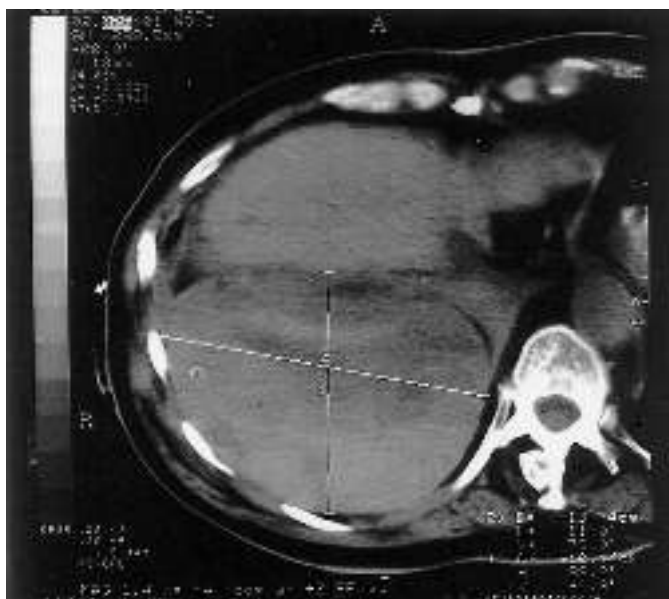


Figure 3: Thoracic CT scan shows the largest size of retropleural hematoma.

breath sounds were heard in the right chest. The right hemothorax was dullness to percussion. Arterial blood gas measurement showed a pH of 7.34, a PO_2 of 37 mmHg and a PCO_2 of 23 mmHg.

A diagnosis of massive hemothorax was made and a right chest tube was inserted at the 5th intercostal space anterior to the midaxillary line, but no fluid could be drained. Two large caliber peripheral intravenous catheters were established and rapid crystalloid infusion was started. Blood tests included hematocrit of 40.4% (normal value: $47 \pm 5\%$), hemoglobin of 14.4 g/dL (normal value: 16 ± 2 g/dL), white blood cell count of 21500 μ L (normal value: 4800-10800 μ L) and an international normalized ratio (INR) of 4.1 (normal value: 0.8-1.2). A portable postero-anterior chest x-ray showed an increase of radio-

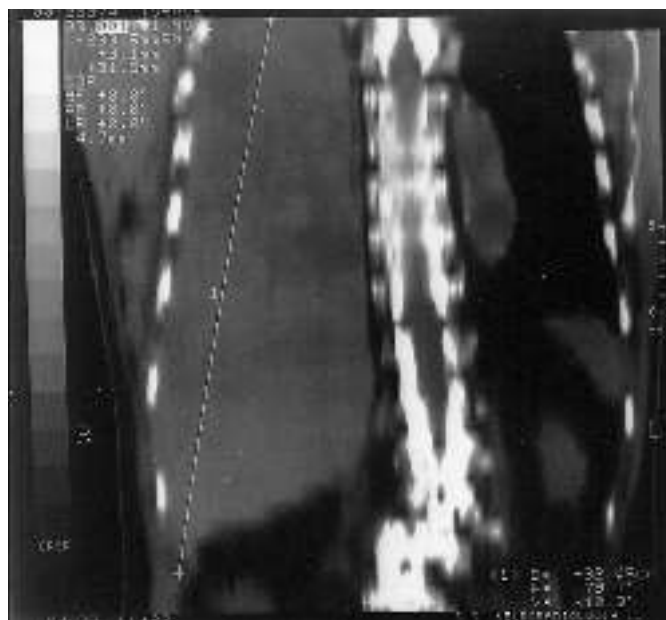


Figure 4: Thoracic CT scan shows the retropleural hematoma filling the right chest.

opacity in the right hemithorax; the chest tube appeared bent forward (Fig. 1). The response to volume resuscitation was satisfactory and the patient became hemodynamically normal (blood pressure 110/70 mmHg, heart rate 90/min, respiratory rate 20/min). A contrast-enhanced CT of the chest revealed the presence of a very large (10 x 13 x 32 cm) posterior extrapleural hematoma (Figs. 2, 3,

4). During the examination, the hemodynamic and respiratory conditions suddenly impaired, with no spontaneous ventilation and pulse. An endotracheal intubation was performed and the patient was taken to the operating room. After an anterolateral incision at the 7th intercostal space, the bleeding source, corresponding to the intercostal artery injured by the fracture bone edges, was identified, bleeding control was obtained and the large extrapleural hematoma was drained. During the operation the patient sustained a cardiac arrest that was successfully reversed by closed hearth massage. Multiple organ failure complicated the postoperative course and the patient died on postoperative day-3.

Discussion

Hemothorax is a recognized complication of thoracic trauma, often responsible of a hemorrhagic shock. Conversely the extrapleural space is a rare site of blood effusion and only 6 cases of very large epipleural hematoma after a rib fracture have been previously described (3, 4, 7, 8). It is interesting to note that almost all these cases concerned old patients and that hematomas developed several hours after the trauma. It is likely that in the elderly the displaced edges of fractured ribs are particularly sharp and, thus, more prone to injury the intercostal arteries in the days after trauma, following dressing or other involuntary movements of the patients. Diagnosis is difficult and often delayed (4 reported cases of large hematoma were autoptic findings after a sudden hypovolemic shock (4, 7, 8)); it may be exceptionally made on the sole basis of x-ray findings and, usually, a thoracic CT scan is required. A typical CT finding is represented by the "fat sign", a displacement of the thoracic soft-tissue band medially to the ribs due a fluid collection in the extrapleural space (1).

Surgical treatment is an essential step for hemorrhage control in these patients. A conservative approach has been successfully employed in selected patients with a small hematoma and no respiratory impairment or laboratory abnormalities (5). Blood collection may be monitored by close CT scan controls, but if the patient shows a hemodynamic instability, operation is mandatory, especially if a large hematoma is present. At operation, bleeding control can be more easily obtained through an

incision over the fracture site, where vascular injury can be identified and hemostasis obtained.

To our knowledge this is the first case reported in a patient on anticoagulation. The prolonged INR represented the detrimental factor to his outcome in that a spontaneous stop of bleeding was less likely to occur and the blood collection reached rapidly such a large volume. We believe the hematoma collected in the extrapleural space rather than in the pleural one, probably, because of a previous pleuritis with fusion of the two pleuric layers.

Among patients with rib fractures, those aged and with displaced fractures are at higher risk for this complication. In these conditions, despite the modern days of manged care, hospital admission and a closed monitoring for several days is recommended.

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Commento

Commentary

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Il caso descritto costituisce un raro evento patologico non tanto per l'eziologia che ne sta alla base, il trauma, quanto per le modalità con cui si realizza la raccolta ematica. Lo scollamento della pleura parietale, che raggiunge un'estensione quasi incredibile, impedisce che il versamento emorragico invada il cavo pleurico. Probabile concausa importante, come è ipotizzato dagli AA., è la progressiva presenza di sinichie pleuriche che, probabilmente in molti casi, riescono a limitare l'entità dell'evento patologico.

È corretto, peraltro, l'atteggiamento terapeutico che richiede un intervento chirurgico di evacuazione e di emostasi solo quando il volume della raccolta è di tale entità da determinare un'ipovolemia-anemia di grado elevato o una riduzione della capacità respiratoria non accettabile.

Il caso segnalato ha il merito di evidenziare una situazione patologica che può essere definita "emorragia maggiore": questo evento è osservabile sempre più di frequente perché è in aumento il numero degli individui portatori di protesi valvolari cardiache che praticano una terapia con anticoagulanti orali e che hanno valori di INR attorno a 4-5, come nel caso descritto.

Gli eventi emorragici "maggiori" come le emorragie intracraniche, quelle gastroenteriche, quelle postraumatiche, ecc. hanno posto nei medici curanti grandi dubbi su come comportarsi dovendo affrontare in queste situazioni, molto spesso, un intervento chirurgico con necessità di ottenere una buona e permanente emostasi.

Devo segnalare che questi dubbi sono stati risolti solo recentemente quando è comparsa sulla rivista Chest, del 2001, la prima pubblicazione che segnala come a fronte di una emorragia maggiore e del suo più idoneo trattamento che può richiedere un ripristino dei fattori della coagulazione tali da ricondurli a valori normali, il rischio di una trombosi delle valvole o di trombosi in genere, indotto dalla sospensione dell'anticoagulante e/o dalla somministrazione di fattori della coagulazione, è di minore entità rispetto a quello dell'evento patologico emorragico.

This case deals with an extrapleural hematoma after thoracic blunt trauma; it is a very rare event, not only for etiology but for pathophysiology too. Massive parietal pleura detachment blocks pleural effusion and it is probably due to pleural adhesions, limiting the effects of the trauma.

Evacuiative and haemostatic surgical approach is necessary only in case of severe anaemia or dyspnea.

This case report describes a "major haemorrhage", a quite common disease, nowadays, because of the high number of patients submitted to cardiac valve replacement and assuming anticoagulant drugs causing INR increment.

Major haemorrhages (intracranic, posttraumatic or gastroenteric ones) in patients assuming anticoagulant drugs represent a big challenge for the surgeon who has to decide anticoagulant drug stoppage and the necessity to operate on or not; recently (Chest 2001) it has been established that thromboembolic risk due to anticoagulant drug stoppage is lower than the haemorrhagic one; it is also important that accurate monitoring ends when surgical therapy has been decided. An accurate surgical timing is required to avoid surgical approach during general conditions deterioration, nullifying surgical therapy.

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