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Case report

Traumatic chylothorax: A case report and review



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A B S T R A C T

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Chylothorax is a rare entity characterised by leakage of lymphatic fluid into the pleural cavity from the thoracic duct. We present a case of traumatic chylothorax following a traumatic fracture of the L1 vertebra. An 84-year-old lady presented to the emergency department after being found collapsed at home. She gave a preceding history of one day of diarrhoea. Chest X-ray showed a rightsided effusion. Drainage of the effusion yielded a cloudy, off-white fluid that settled in layers in the drainage container. Pleural fluid examination revealed a lymphocyte-rich transudate with high levels of cholesterol and triglycerides. CT imaging of the chest, abdomen and pelvis revealed an acute left sided pulmonary embolus, and a multisegment burst fracture of the L1 vertebra. The patient was anticoagulated for the pulmonary embolus. Conservative fracture management was advised. Chylous drainage of 11/24hr was observed. Due to ongoing chylous leak the patient was commenced on a medium-chain fatty acid diet and octreotide. Whilst chylous drainage ceased the patient died from infected pressure sores, malnutrition and acute kidney injury. Spinal trauma can rarely cause disruption of the thoracic duct and chylothorax. Diagnosis of chylothorax hinges on the typically high triglyceride content of chylous fluid and the detection of chylomicrons where the triglyceride concentration is equivocal. Management options for persistently draining chylothorax are varied and range from non-invasive medical measures to radiological and surgical interventions (although the patient in the case we present was an unsuitable candidate for surgery). We discuss pertinent diagnostic testing and put forward possible medical management strategies for chylothorax.

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Introduction

Chylothorax is a rare entity characterised by leakage of lymphatic fluid into the pleural cavity from the thoracic duct. Complications include respiratory compromise, malnutrition and lymphopaenia-associated immunosuppression [1]. Causes of chylothorax include malignancy and iatrogenic disruption of the thoracic duct during surgery. We present a case of traumatic chylothorax following a fracture of the L1 vertebra and discuss recognised medical and surgical management strategies.

Case report

An 84-year-old lady with a background of hypothyroidism and hypertension presented to the emergency department after being found collapsed at home by her daughter-in-law. She gave a

preceding history of one day of diarrhoea and vomiting that had settled by the time of presentation. She was initiated on management for acute kidney injury and admitted to the acute medical assessment unit. An admission chest X-ray demonstrated small bilateral pleural effusions.

On day 4 of admission, the patient experienced increasing breathlessness with reduced breath sounds noted in the right lung field on auscultation. A repeat chest X-ray showed a progression of the right-sided effusion with an unchanged small left-sided effusion [Fig. 1].

Drainage of the right-sided effusion yielded a large volume of fluid that was initially heavily bloodstained but later a cloudy, off-white fluid that settled in layers in the drainage container. The patient improved significantly with drainage of the effusion and the fluid was sent for biochemistry and cytology.

Cytology revealed a lymphocyte-rich fluid with blood and benign reactive mesothelial cells. Fluid pH was 7.84, fluid protein 18 g/L, fluid LDH 511 IU/L, cholesterol 1.06 mmol/L, triglycerides 13.1 mmol/L. The diagnosis of chylothorax was made on the basis of the fluid biochemistry, with cholesterol <5.18 mmol/L and

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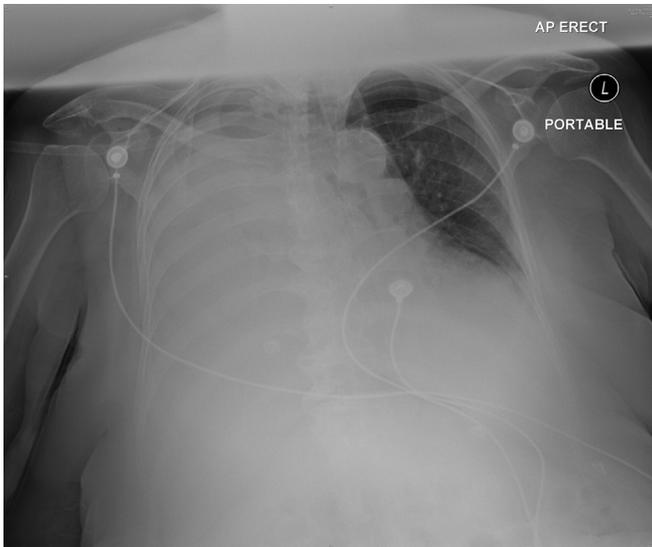


Fig. 1. Chest X-ray demonstrating progression of effusion.

triglyceride count >1.24 mmol/L diagnostic of chylous pleural fluid [2]. Fluid chylomicron concentration was not available at the time of writing.

Review of the history with family members revealed a history of falls prior to admission that the patient herself struggled to recall. CT imaging of the chest, abdomen and pelvis revealed no evidence of malignancy, an acute left sided pulmonary embolus, and a multisegment fracture of the anterior two-thirds of the L1 vertebra with no posterior column involvement and a small associated paravertebral mass [Fig. 2]. The patient was anticoagulated for the pulmonary embolus, and the opinion of the spinal surgeons was that the fracture was stable and that the patient should be mobilised as tolerated.

Copious drainage of fluid continued from the Seldinger drain, peaking at one litre per day. The advice of cardiothoracics was sought, and the patient was started on a medium chain fatty acid diet and octreotide upon their recommendation.

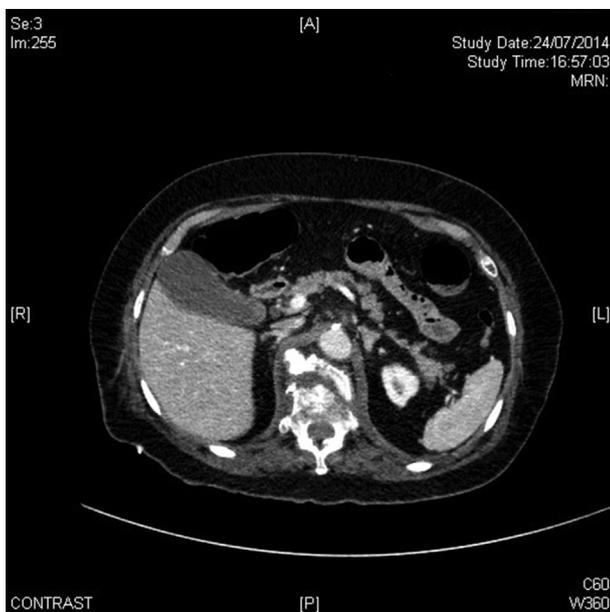


Fig. 2. CT imaging demonstrating burst fracture of L1 vertebra.

The drain output decreased over the next few days and the patient initially appeared to improve clinically, but was slow to mobilise and developed a sacral pressure ulcer that became infected. She deteriorated over the following few days and later died.

Discussion

Traumatic chylothoraces are usually iatrogenic in aetiology, with 80% of these caused by damage to the thoracic duct during surgery such as oesophagectomy or pneumonectomy [3]. Blunt trauma causing chylothorax is less common, but when it does occur it is often associated with fractures of posterior ribs and/or spinal fractures (as in this case) [4]. Diagnosis of chylothorax is based upon the lipid content of the pleural fluid as described above, with presence of chylomicrons in fluid being a useful additional diagnostic tool where facilities are available to test for them [2].

Given the large volume of lipid- and lymphocyte-rich fluid lost in a chyle leak, nutritional support of these patients is of paramount importance to prevent malnutrition, dehydration and immunosuppression [5]. In addition, administering a diet with a predominance of medium chain triglycerides reduces lymphatic flow and therefore minimises the rate of chyle leakage. Medium chain triglycerides are absorbed directly from the gut into the portal circulation while longer chain triglycerides are packaged into chylomicrons and transported into intestinal lacteal vessels [6]. These lymphatic vessels drain into the thoracic duct, which eventually drains into the bloodstream at the subclavian vein.

Removal of fluid via intercostal chest drain is indicated when a chylothorax is large enough to cause respiratory distress [3]. Intercostal drainage is also useful in that output volumes and rates can be measured accurately. Where output remains high even with administration of a medium chain fatty acid diet, octreotide (a somatostatin analogue) has been used successfully in reducing chyle leakage [7,8], although there is a paucity of randomised control trials assessing its effectiveness, possibly due to the rarity of chylothoraces. Octreotide is useful as an adjunct to surgical management or where surgical management is not desired or contraindicated.

If chyle drainage remains copious even with conservative measures, thoracic duct ligation (either via thoracotomy or thoracoscopically) has been undertaken with encouraging results: 90% are successful when ligation is undertaken just superior to the level of the right hemidiaphragm [2]. In cases where the thoracic duct cannot be identified, chemical pleurodesis with talc can be performed, which has been shown to have high rates of success in some case series [3].

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