

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Trauma Case Reports

journal homepage: www.elsevier.com/locate/tcr

Case Report

Massive bilateral chylothorax post blunt trauma

Christina Kozul*, Karishma Jassal, Rodney Judson

Department of Trauma, The Royal Melbourne Hospital, Melbourne, Victoria, Australia

ARTICLE INFO

Keywords:

Chylothorax
Blunt
Trauma
Review

ABSTRACT

Chylothorax caused by blunt trauma is extremely rare. We present a case of bilateral massive chylothorax post blunt trauma and a review of the literature regarding the identification and management of this rare diagnosis. An eighteen-year-old male was involved in a motor vehicle crash where he sustained multiple injuries including a right, moderate to large, haemopneumothorax, a small left haemopneumothorax, left T8, T9, L1 and L2 acute transverse process fractures and fractures of bilateral 11th ribs. An intercostal catheter was inserted on the right side which initially drained blood-stained fluid however milky colour fluid was noted to be draining 11 h post insertion. Further imaging revealed a left pleural effusion causing a mediastinal shift where, once drained, also revealed a chylothorax. The patient was managed conservatively with bilateral intercostal catheters and a no fat/low-fat diet. The patient was discharged day seven post removal of bilateral intercostal catheters.

Case report discussion

Chylothorax caused by blunt trauma is extremely rare [1–3]. We present a case of bilateral massive chylothorax post blunt trauma.

An eighteen-year-old male arrived via ambulance services post a high-speed motor vehicle rollover accident. Following initial assessment in the emergency department, a computer tomography (CT) trauma series was performed identifying: a right, moderate to large, haemopneumothorax, a small left haemopneumothorax, left T8, T9, L1 and L2 acute transverse process fractures, a left humeral head and neck comminuted fractures and fractures of bilateral 11th ribs. He had been previously well with a past medical history of substance use and thoracic spine fractures (T6 and T10) managed conservatively post a previous motor vehicle accident. A right 32F intercostal catheter (ICC) was inserted, confirming a haemothorax which initially drained 550 ml of heavily blood-stained fluid.

Approximately 11 hours' post chest tube insertion milky coloured fluid, presumed chyle, was noted to be draining. A repeat CT chest was performed day one of admission which revealed a large left sided pleural collection (HU2) with mediastinal shift to the right (Fig. 1). Following insertion of a left 32F ICC, there was immediate drainage of clinically identifiable chyle (Fig. 2).

Day two of admission, there was a formal Cardiothoracic and dietician review, with a plan for conservative management if ICC drain output remained less than 1 l per day and a no fat/low-fat diet. The ICC drainage per day of admission is shown in (Table 1). A nuclear medicine scan (99mTc Dextran, 450 MBq) was performed day six of admission which revealed no evidence of lymphatic leak into the chest. Both ICC's were removed day seven of admission without complications. The spinal and rib fractures were managed conservatively and the limb fractures were managed operatively day one of admission. The patient was uneventfully discharged day seven of admission. The patient failed to attend the planned review at the Cardiothoracic outpatient clinic four weeks post discharge.

* Corresponding author at: Department of General Surgical Specialties, The Royal Melbourne Hospital, Parkville, VIC 3052, Australia.
E-mail address: Christina.kozul@mh.org.au (C. Kozul).



Fig. 1. Axial computer tomography (arterial phase). Large left pleural effusion (HU2) with mediastinal shift to the right. Left T8 acute transverse process fracture.



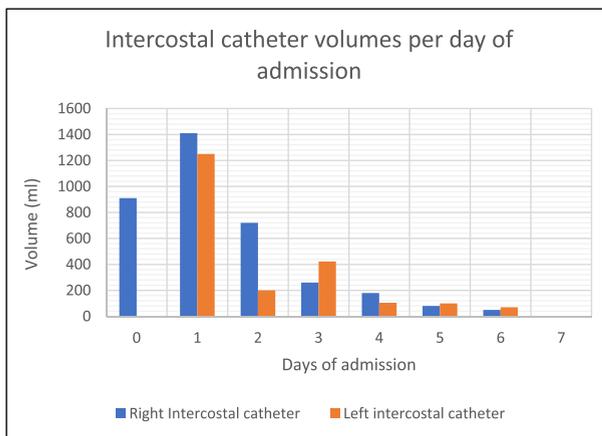
Fig. 2. Picture of left intercostal catheter atrium day zero post insertion of the intercostal catheter containing approximately 450 ml of milky fluid presumed to be chyle.

Discussion

Chylothorax is the accumulation of chyle within the chest cavity [4]. The most common causes of chylothorax are iatrogenic, predominantly following thoracic or esophageal operations (0.4% to 2%) [5]. Other causes include neoplastic, traumatic and congenital [4]. Chylothorax post blunt thoracic trauma is an extremely rare condition, with the incidence estimated to be 0.2% to 3% [6]. The rarity of this condition is attributed to the well-protected position of the thoracic duct within the chest cavity [3,6]. The exact mechanism of thoracic duct injury is unclear in blunt traumatic chylothorax, however, most the authors agree that it can be attributed to a fracture or other injury to the neighboring thoracic spine which subsequently causes a disruption to the thoracic duct [1,2,4].

Chylothorax is almost always an incidental finding post insertion of an intercostal catheter which is subsequently found to drain milky pleural fluid [3]. It is indistinguishable from a haemothorax on standard chest X-rays [7]. The diagnosis of chylothorax can be confirmed with the measurement of pleural fluid triglyceride or chylomicron levels [3,4].

Table 1
Right and left intercostal catheter volumes (ml) per day of admission.



thoracotomy [8] or newer techniques such as ligation via thoracoscopy and thoracic duct embolisation [6]. The likelihood of successful conservative management is drastically reduced when the daily chyle output exceeds 1000 ml/day for > 5 days [9] or 1500 ml/day in an adult or > 100 ml/kg body weight per day in a child [10]. Prior to operative management, lymphangiography or pre-operative enteral administration of a fat source to which methylene blue can be added can help to identify the leak source [6].

Conclusions

Chylothorax is a rare complication of blunt thoracic trauma. Understanding of the pathophysiology is required to minimise the associated complications. Most patients can be managed conservatively, however, patients who have prolonged high output chylothorax or are symptomatic from chyle loss require early surgical intervention.

Acknowledgments

There are no sources of funding to declare.

Conflicts of interest statement

There are no conflicts of interests to declare by any of the listed authors.

References

- [1] M. Sokouti, B.A. Aghdam, Delayed concurrent chylothorax and chyloperitoneum: report of a case after an old blunt trauma, *Tanaffos* 10 (1) (2011) 52–56.
- [2] E. Apostolakis, K. Akinosoglou, E. Koletsis, D. Dougenis, Traumatic chylothorax following blunt thoracic trauma: two conservatively treated cases, *J. Card. Surg.* 24 (2009) 209–222.
- [3] K. Idris, M. Sebastian, A.F. Hefny, N.H. Khan, F.M. Abu-Zidan, Blunt traumatic tension chylothorax: case report and mini-review of the literature, *World J. Clin. Cases* 4 (11) (2016) 380–384.
- [4] E. Seitelman, J.J. Arellano, K. Takabe, L. Barrett, G. Faust, L.D.G. Angus, Chylothorax after blunt trauma, *J. Thorac. Dis.* 4 (3) (2012) 327–330.
- [5] B. Chincock, Chylothorax: case report and review of the literature, *J. Emerg. Med.* 24 (2003) 259–262.
- [6] T.G.S.B. Pillay, A review of traumatic chylothorax, *Injury* 16 (47) (2016) 545–550.
- [7] S. Kumar, B. Mishra, A. Krishna, A. Gupta, S. Sagar, M. Singhal, et al., Nonoperative management of traumatic chylothorax, *Indian J. Surg.* 75 (Suppl. 1) (2012) S465–S468.
- [8] M.R.C. Chamberlain, Late presentation of tension chylothorax following blunt chest trauma, *Eur. J. Cardiothorac. Surg.* 18 (2000) 357–359.
- [9] L.S.A. Dugue, O. Farges, et al., Output of chyle as an indicator of treatment for chylothorax complicating oesophagectomy, *Br J Surg* 85 (1998) 1147–1149.
- [10] B.C.N.K. Marts, A.C. Fiore, et al., Conservative versus surgical management of chylothorax, *Am. J. Surg.* 164 (1992) 532–534 (discussion 534–5).