



TRAUMATIC CHYLOTHORAX: A CASE REPORT / CHYLOTHORAX TRAUMATIQUE : UN CAS CLINIQUE

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Summary

Chylothorax is an uncommon condition, and more so chylothorax secondary to blunt trauma. However, when it occurs it can be debilitating and life threatening, unless appropriate treatment is instituted on time. We present the case of a 39-year old man who fell from a height and developed chylothorax secondary to blunt trauma, amidst other injuries. He was admitted, managed conservatively and discharged home 17 days later in satisfactory condition.

Keywords: chylothorax, blunt trauma, conservative management,

Introduction

Chylothorax is the presence of lymphatic fluid in the pleural space. It results from leakage from the thoracic duct or one of its major divisions. The thoracic duct originates in the abdomen usually as a single efferent trunk of the cisterna chyli, a lymphatic dilatation located on the vertebral bodies from T12 – L2. The duct passes through the aortic hiatus of the diaphragm, ascends through the right posterior mediastinum between the azygos vein and descending thoracic aorta, and behind the oesophagus. At the angle of Louis (T4/T5 intervertebral disc) it crosses the midline to the left, and ascends into the neck to join the venous system at the junction of the left internal jugular and subclavian veins. It is often said that the only constant thing about the anatomy of thoracic duct is its variability¹. The function of the thoracic duct is to transport ingested fat into the venous system. In the normal individual, 1500 - 2500 ml of chyle flows through the system per day². The rate increases after a meal, especially after a fatty one. Injury to the thoracic duct leads to leakage and lymph collection in the pleural

space which if significant can embarrass the respiratory system. It also causes malnutrition if the course is protracted since it contains high levels of proteins and lipids. The management is either conservative or surgical, and it is important to monitor the patient closely for timely conversion from conservative to surgical management to avoid the deterioration of the patient. The occurrence of chylothorax after various cardiothoracic procedures is 0.2 – 1%³. However, the literature is sparse on chylothorax secondary to blunt trauma. This is a case of chylothorax secondary to blunt trauma.

Case report

A 39-year old driver fell from the scaffolding on a building from the height of about 5 metres. He sustained several injuries. He had a left Cole's fracture, for which he had a below elbow Plaster of Paris (POP) cast. He also had spondylolesthesis of L1/L2 (figure 1), but with no neurological deficits. Seven days after the fall, he developed a full and tender abdomen. Examination revealed both ascites and a right

pleural effusion (figure 2). Both taps yielded milky fluid so chylothorax and chyloperitoneum were suspected.



Fig. 1: X-ray showing L1/L2 spondylolesthesis (arrow)



Fig.2: .Chest x-ray showing right pleural effusion

We decided to start with the conservative approach. The Neurosurgical team had also decided to manage the spondylolesthesis conservatively. A chest tube was inserted with under water sealed drainage. He was put on intravenous fluids, intravenous antibiotics, analgesics and nil per os. Analysis of the pleural fluid confirmed the chylothorax; high albumin, high total protein and high lipids. The triglyceride was 2000mg/dl, total cholesterol 237mg/dl, total protein 1200mg/dl and albumin 520mg/dl. Our diagnosis was based on these high values, especially that of triglyceride above 110mg/dl. The next sample taken a week later showed a reduction of these values, suggesting the gradual resolution of the condition. The triglyceride was 80mg/dl, total cholesterol 100mg/dl, total protein 490mg/dl and albumin 300mg/dl. The milky fluid

had also become serous. The abdominal symptoms also gradually resolved. Fig. 3 shows the chest tube drainage pattern.

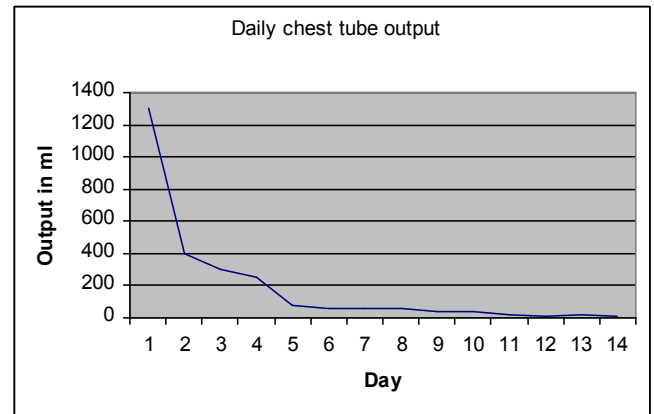


Fig. 3. Daily chest tube output

On the 14th day of admission he started fluid diet and on the 15th day started normal diet. There was no drainage from the chest tube so on the 16th day a chest x-ray was done which confirmed the full expansion of the lungs and the absence of fluid in the pleural cavity. The chest tube was removed. He was discharged home on the 17th day of admission. A total of 2685ml of fluid was drained over the period of two weeks. Subsequent reviews over several months were normal.

Discussion

Chylothorax is an uncommon condition⁴. When it occurs the patient has to be monitored closely because it can be very debilitating, especially post-operative chylothorax. The aetiology is classified in various ways. One of the commonest classifications considers it as congenital, acquired traumatic, acquired non-traumatic, and miscellaneous^{1,2,3,5,6}. The commonest cause under congenital is birth trauma¹. Traumatic causes are blunt injury, penetrating injury, and post-operative, after thoracic, abdominal and cervical operations. By far most cases are traumatic (50%)⁷. A non-traumatic cause is neoplasms. Some examples of miscellaneous causes are cirrhosis, tuberculosis and filariasis. For chylothorax from blunt trauma, as in this patient, the mechanism of injury is sudden hyperextension of the spine with rupture of the duct or cisterna chyli¹. The symptoms and signs of chylothorax are essentially those of pleural effusion, usually on the right, and occurring 2 to 10 days after the initial injury¹. These features were typified in this patient: he had a spine spondylolesthesis at L1/L2 where the cisterna

chylus is usually located, and therefore probably leading to a tear in the cisterna chyli. He also had a right pleural effusion which became clinically evident 7 days after the trauma. The pathophysiology involves the loss of protein and lipid-rich fluid into the posterior mediastinum and consequently into the pleural cavity. This leads to malnutrition and dehydration. In addition, the increasing pleural fluid accumulation can embarrass the respiration. The diagnosis of chylothorax requires the triglyceride to be above 110 mg/dL^{1,4}. Microscopy reveals fat globules that clear with alkali and ether, or stain with Sudan-3¹. Our diagnosis was based on the fact that this patient's first sample contained triglyceride of 2000mg/dl.

Table 1: Composition of chyle^{1,2}

Component	Reference:	1 st sample	2 nd sample
Total protein	1000 – 7000 mg/dl	1200 mg/dl	490 mg/dl
Albumin	1200 – 4000 mg/dl	520 mg/dl	300 mg/dl
Total cholesterol	65 – 220 mg/dl	237 mg/dl	100 mg/dl
Triglycerides	400 – 6000 mg/dl	2000mg/dl	80 mg/dl

The management is either conservative or operative. There is some controversy over its management, particularly the relative merits of conservative management and the timing of surgical intervention. The management involves a conservative approach for a maximum of 14 days, after which the operative approach has to be used if indicated^{1,2,8}. Radiotherapy is done for malignant chylothorax. The conservative approach involves drainage of the pleural space, reduction of chyle production by instituting nil per os and giving total parenteral nutrition, or a fat-restricted oral diet supplemented with medium-chain triglycerides. The medium chain triglycerides are absorbed directly into the portal system, not through the usual lymphatic system, thus reducing lymphatic flow. Where octreotide is available, it can be given. It is a long-acting somatostatin analog that acts on vascular somatostatin receptors and minimizes lymphatic fluid excretion^{4,9}. The conservative approach leads to spontaneous resolution in 50% of cases³. The indications for operation are chest tube drainage of more than 500ml/day for two weeks, nutritional and metabolic complications, including electrolyte depletion and immunosuppression, loculated chylothorax, or an entrapped lung^{1,4}. Post-oesophagectomy chylothorax is associated

with a very high mortality (50%- 82%), and therefore in such a situation, surgery is preferred. The surgical approach involves one of the following: direct ligation of the thoracic duct, mass ligation of thoracic duct tissue, pleura-peritoneal shunting, pleurectomy, and fibrin glue application.

Conclusion

Chylothorax is uncommon, much more so chylothorax from blunt trauma. The complications can be debilitating, unless appropriate treatment is instituted on time. The management can be conservative or operative. For this patient the conservative approach was used and it was successful.

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