EMERGENCY CASEBOOK

Chylothorax

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During a high-speed road traffic accident, a 26-year-old man suffered multiple fractures of his thoracic vertebrae and bilateral pneumothoraces. The day after admission and commencement of nasogastric feeding, milky fluid was noted in his right chest drain. Feeding was stopped and a contrast oesophogram and oesophagoscopy were performed, which were normal. The chylothorax quickly resolved and both drains were removed on day 6. Initial treatment of chylothorax aims to decompress the pleural space and minimise chyle production by not feeding the patient via the enteral route. Most authors recommend conservative management for 2 weeks or more unless certain parameters are met: average daily chyle loss of > 1.5 l for a 5-day period, or imminent nutritional complications. In this case, surgical management of the chylothorax and spinal fractures was planned. However, conservative management was successful, highlighting the fact that early aggressive surgical intervention for chyle leaks in blunt trauma is not necessary.

Chylothorax describes the presence of chyle in the pleural space and occurs after damage to, or obstruction of, the thoracic duct. Iatrogenic injury, particularly during cardiothoracic surgery, accounts for nearly half of all cases,¹ with malignancy being another leading cause. The thoracic duct is located deep in the mediastinum, protected by the spine posteriorly and mediastinal contents anteriorly, and so is rarely damaged in blunt chest trauma.

The thoracic duct transports up to 4 l of chyle a day, rich in fat, protein and white blood cells. Chylothorax can be mild or severe depending on the volume of chyle loss. Large leaks can cause nutritional deficiencies, respiratory dysfunction, dehydration and immunological dysfunction.² Feeding, especially with food that is rich in fats, stimulates chyle production. Because of this, damage to the thoracic duct may become evident in patients only when feeding is started.

CASE REPORT

A 26-year-old man was brought to the emergency department after being injured in a high-speed motor vehicle crash, during which he hit a lamp-post and was ejected from his vehicle, while under the influence of recreational drugs. He was transferred to hospital on a spinal board with a cervical collar in place. On arrival he was found to be haemodynamically stable, with a Glasgow Coma Score of 13/15. Oxygen saturation was 85% on oxygen due to bilateral pneumothoraces. Bilateral chest drains were inserted in the emergency department and oxygenation rapidly improved.

The patient was paralysed, sedated and ventilated, and computed tomography of the head, cervical spine, chest, abdomen and pelvis was performed. At completion of the secondary survey, the following injuries were found: unstable fracture of T3, fractures of sternum, 1st left rib, transverse and spinous processes of C6 to T4, bilateral pneumothoraces, pulmonary contusions and a mediastinal haematoma of venous origin.

The patient was transferred to the adult intensive care unit and continued to be haemodynamically stable throughout his admission. On day 1, nasogastric feeding was started at 10 ml/h at 13:00 h. The right chest drain had drained 300 ml of blood-stained serous fluid. The next morning, 625 ml of milky fluid was found in the right chest drain, at which point feeding was stopped.

To exclude a missed oesophageal injury, contrast oesophography and oesophagoscopy were performed and were found to be normal. Traction halo was applied as management of the spinal fractures.

Feeding was restarted at 50 ml/h at 00:00 h on day 3, and 400 ml of chylous fluid was drained from the right chest tube over the following 24 h. Drainage gradually decreased over the next 48 h (230 and 100 ml) and both drains were removed on day 6. A tracheostomy was performed on the same day, traction was removed and a padded halo jacket was fitted. Sedation was stopped on day 7, and the patient decannulated himself the day after.

The patient was discharged on day 13 after admission with the halo jacket in situ with a plan to be immobilised for 8 weeks. He was well 3 weeks after discharge.

DISCUSSION

Chylothorax is a complication in <1% of cardiothoracic procedures, but they make up nearly half of all cases.² It is a severe complication with a mortality that can approach 50% if not treated adequately.³ With early diagnosis and prompt treatment, the current mortality from an iatrogenic cause is <10%.⁴

Chylothorax as a result of blunt thoracic trauma is rare.¹ When it does occur, it is associated with fractures of the spine and/or posterior ribs.⁵ Silen and Weber found only 13 cases that had been reported with thoracic vertebral fractures since 1952. Two patients died, six required ligation of the thoracic duct and six were treated conservatively (including their own case).⁶ A literature search discovered only three further cases with associated fractures. Two of these were treated conservatively.

Initial treatment aims to decompress the pleural space and minimise chyle production by not feeding the patient via the enteral route. It is generally agreed that low-volume chyle leaks should initially be treated conservatively. When to abandon conservative management and proceed to surgery is a difficult decision. If surgery is needed, it is important to do this before the patient's chyle loss leads to complications affecting the risks and success of surgery.

Ikonomidis *et al*⁷ suggest conservative management for 2 weeks in the first instance, unless thoracotomy is indicated for associated injuries, when ligation of the thoracic duct can be carried out. If drainage persists at >500 ml/day after 2 weeks, surgery is suggested. Otherwise, a further 2 weeks of conservative management is appropriate. Thoracotomy is recommended after this time if there is persistent drainage, although other authors have recommended video-assisted thorascopic surgery. Most authors recommend conservative management for ≥ 2 weeks unless certain parameters are met: average daily chyle loss of >1.5 l for a 5-day period or imminent nutritional complications.

In this case, the chyle leak was discovered once feeding had started. When the diagnosis was made, feeding was initially stopped. It was initially decided that the patient would go to the theatre for stabilisation of his spinal fractures and ligation of the thoracic duct. Feeding was restarted in order to stimulate chyle flow and help demonstrate the location of the leak intraoperatively. However, the leak quickly slowed and stopped with conservative management, highlighting the fact that early aggressive surgical intervention for chyle leaks in blunt trauma is not necessary.

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