

# TRAUMATIC CHYLOTHORAX FOLLOWING A CLOSED CHEST INJURY

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## SUMMARY

*A case of Traumatic Chylothorax is presented with its typical clinical presentation. Failure of conservative measures led to a transthoracic ligation of the thoracic duct, with good result.*

## CASE REPORT

A 29 year old Chinese male was involved in an accident when his motorcycle skidded and hit the rear of another vehicle and he was thrown over the kerb. He sustained minor injuries over the limbs, and was admitted to the District Hospital Kota Tinggi. His observations were steady and he was discharged two days later.

Three days later he returned with complaints of dyspnoea and discomfort in the right side of the chest. A chest skiagram showed a massive right sided pleural effusion. The following day he was transferred to General Hospital Johor Bahru, and noted to be dyspnoeic, with mild pallor, but not cyanosed, B.P 110/70 mmHg and pulse rate 106/mt. There was decreased movements in the right hemithorax, which was dull on percussion and absent breath sounds. From the right pleural cavity 425ml of haemorrhagic serous fluid was aspirated.

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A subsequent chest skiagram showed adequate right lung expansion and the patient was comfortable.

Two days later he felt discomfort in the chest and a skiagram showed re-accumulation of fluid in the right pleural cavity, and obliteration of the left costo-phrenic angle. Bilateral pleural drainage tubes were inserted and 3300 ml. of thin, whitish fluid on the right side, and 800 ml. of blood stained fluid on the left side were obtained on the first day. The left sided tube drained minimal amounts, and was removed three days later. The right sided tube continued to drain 2.0 to 3.5 litres of milky fluid

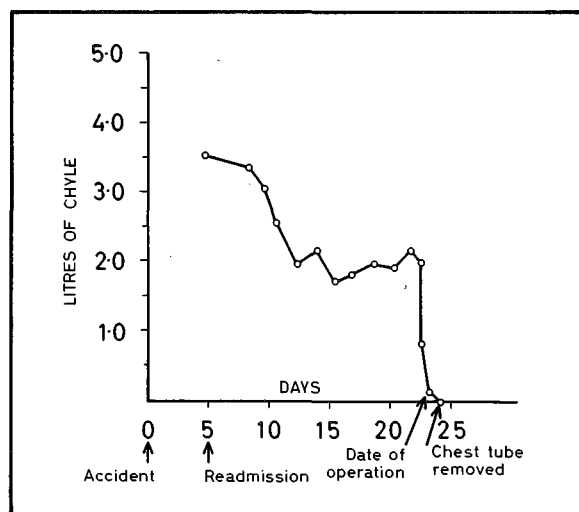
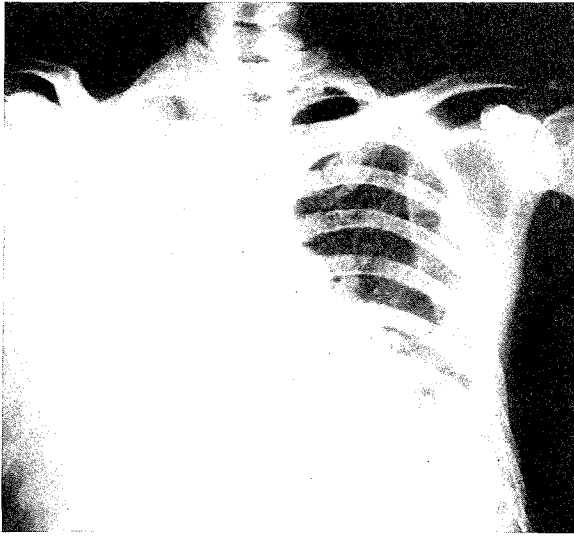


Fig. 1 Showing the amount of Chylous fluid drained from the right pleural cavity.

per day (Fig. 1). He was maintained on intravenous feeding of aminoacids and intralipids, and supplemented with a fat free, high protein diet.



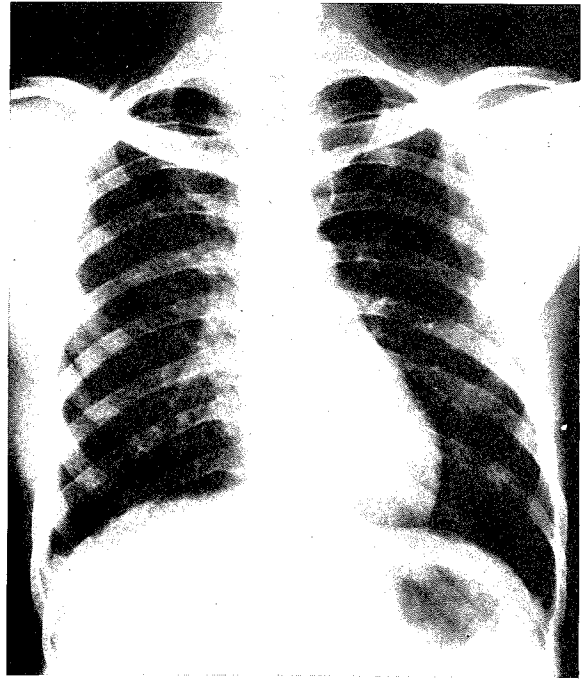
**Fig. 2** Pre-operative chest x-ray - 19 days following the accident showing the right Chylous effusion.

On the 19th day following the accident he was transferred to the University Hospital Kuala Lumpur. The patient was noted to be well except for the persistent drainage of chyle through the right pleural drain. A skiagram of the chest revealed fractures of the 10th, 11th and 12th ribs on the right side (Fig. 2). Three days after his transfer to the University Hospital, a right sided thoracotomy through the 7th rib space was performed. The pleural cavity contained 250 ml of milky fluid. The pleural surfaces and lung appeared healthy. A hole, 4 mm in diameter was seen at the medial end of the right diaphragmatic dome behind the pericardium, through which chylous fluid was noted to exude into the pleural cavity. Dissection was extended into this space to identify the thoracic duct between the vena-azygos and the aorta, and this was ligated with 5/0 silk sutures. The chest was closed and drained for two days. The patient made an uneventful recovery and was discharged home on the 12th post-operative day. (Fig. 3). He had lost 27.4 litres of chylous fluid during the period of hospitalization (Fig. 1).

He was reviewed five weeks later and found to be well and symptom free, the total plasma protein rose from 4.2g at the time of operation to 6.6g and with a gain in body weight of 7.2 kg.

## DISCUSSION

Traumatic chylothorax is an uncommon complication of closed chest wall injuries. They are



**Fig. 3** Postoperative chest x-ray with no re-accumulation of effusion.

frequently the result of damage to the thoracic duct due to operation or penetrating injuries like sharp instruments or missiles, and form about 30 percent of all patients with chylothorax. <sup>1</sup>

The site of injury is determined by the anatomy of the thoracic duct; which begins as cisternachyli in the abdomen and ends in the neck after traversing the thorax as a right sided structure up to the level of the fifth thoracic vertebra and then continues on the left side. Hence trauma to the thoracic duct above and below the level of T5 vertebra results in left and right chylothorax respectively. <sup>2</sup> Tear of the thoracic duct as it enters the thorax may be due to fractures of the lower ribs, or the shearing force on the thoracic duct due to hyperextension of the spine over the right crus of the diaphragm. <sup>3</sup>

Our case is a typical example of the usual clinical presentation of traumatic chylothorax following a closed chest injury. The patient is fairly comfortable for about five days, followed by a gradual onset of dyspnoea, pallor, cyanosis, and a rapid thready pulse. The condition is relieved by aspiration of the chylous fluid from the pleural cavity only to reappear. By surgical intervention this outpouring of chyle is identified and the torn

duct ligated. Identification of the site of the thoracic duct injury on thoracotomy in some cases may be difficult because of adhesions and fibrinous exudate. <sup>4</sup> To aid its identification <sup>3</sup> injected water soluble dyes like Evans blue, Methylene blue, and Green coaltar and sky blue dyes in cream or oil have been given orally.

Chyle is said to be bacteriostatic, as shown by the rarity of empyema in chylothorax. <sup>4</sup> In our case we obtained sterile cultures even after repeated thoracocentesis and on thoracotomy. The right pleural cavity and lung surface appeared clear with no plaques.

Traumatic chylothorax was first reported by Quinke in 1875 (quoted by Meharry L. I. & Harris J. 1979). <sup>2</sup> Spontaneous closure of a traumatic thoracic duct fistula has been unreliable. Lee <sup>6</sup> suggested that thoracic duct injuries could be managed by repair or ligation. Lampson <sup>7</sup> introduced the concept of intra-thoracic ligation of the thoracic duct for traumatic chylothorax; since then mortality has fallen considerably. Ligation of the thoracic duct may cause temporary lymph stasis and even chylous collection in peritoneal, pleural and pericardial sacs, but ordinarily after some stasis, the lymph finds way into the circulation through collateral lympho-venous connections. <sup>8</sup>

Selle *et al*<sup>9</sup> advocated conservative measures of management initially, and transthoracic ligation of the thoracic duct for the following:—

1. When chyle loss in an adult averages above 1500 ml/24 hours, over a period of 5 days, and 100 ml/year of age in children.
2. If the flow of chyle has not stopped after a period of two weeks.
3. Patients suffering from nutritional and metabolic complications.

Other measures as right phrenic nerve crush, <sup>10</sup> pneumothorax <sup>4</sup> and anastomosing the lower end of the divided duct to a convenient vein have been tried in the treatment of traumatic chylothorax with poor results.

## ACKNOWLEDGEMENTS

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