Chylothorax Following Esophagectomy: Report of Two Cases

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Two patients with esophageal cancer were found to have a post-esophagectomy complication of chylothorax. These two patients had received neoadjuvant chemoradiation before esophagectomy. With the first patient, the chylothorax was diagnosed after milky fluid appeared from the chest tube drain after the patient was fed with milk on post-esophagectomy day 8. She underwent ligation of the thoracic duct for the chylothorax by a right mini-thoracotomy via the 9th rib bed on post-esophagectomy day 10; her total hospital stay was 28 days. With the second case, the chylothorax was diagnosed during feeding with milk on the post-esophagectomy day 5. He underwent an urgent ligation of the thoracic duct for the chylothorax; at the same time a pericardial window to treat an associated pericardial effusion via a previous thoracotomy was made. This patient’s hospital stay was 18 days. Early detection and treatment of a chylothorax can result the patient having an early recovery.

Key words: esophageal cancer, esophagectomy, chylothorax, pericardial effusion

Introduction

Chylothorax may occur after cardiothoracic surgery, trauma, infection, or from other causes. Post-esophagectomy chylothorax accounts about 1% of cases\(^1\). In the first author’s experience of 212 patients who have undergone esophagectomy for esophageal cancer, only two (0.94%) patients were found to have a postoperative complication of chylothorax. Chylothorax may be associated with chylo-pericardium or pericardial effusion\(^2\). Herein, we report these two cases of post-esophagectomy chylothorax, one of which was associated with pericardial effusion.

Case Reports

Case 1

A 64-year-old female underwent Ivor-Lewis oesophagectomy for esophageal squamous cell carcinoma following neoadjuvant chemo-radiotherapy. At diagnosis, the esophageal cancer was located at 25 cm down to 30 cm away from incisors. The operative procedures consisted of a wide dissection of the mediastinum, diaphragmatic hiatus, and opening of the right and left pleurae. A single chest tube was placed into each side of the pleural cavity at the end of esophagectomy. The pleural drainage of serous fluid, especially from left chest tube was increasing day by day (Fig. 1). A leak of thoracic duct was suspected based on the increasing amount of pleural serous fluid. The triglyceride level of the pleural fluid was 32 mg/dl on post-oesophagectomy days 5 and 8. The diagnosis of chylothorax was based on the presence of milky fluid after nasogastric milk feeding on the post-esophagectomy day 8. The patient underwent a right mini-thoracotomy via the 9th rib bed to ligate the thoracic duct on
post-esophagectomy day 10. Pleural drainage dramatically decreased after ligation of the thoracic duct, and the chest tubes were removed on the post-esophagectomy day 13. In order to provide nutritional support, discharge of the patient was delayed until post-esophagectomy day 28.

**Case 2**

A 32-year-old male underwent Ivor-Lewis oesophagectomy for esophageal squamous cell carcinoma following neoadjuvant chemo-radiotherapy. At diagnosis, the esophageal cancer was located at 20 cm down to 35 cm away from incisions. At surgery, the esophageal cancer was in close contact with the lower half of the trachea and pericardium. The operative procedures consisted of a wide dissection of the mediastinum, diaphragmatic hiatus, and opening of the right and left pleurae. A pleural flap was used to re-enforce the membranous part of lower trachea to prevent the occurrence of a tracheo-pleural fistula. A chest tube was placed in right pleural cavity at the end of esophagectomy. The patient had tachycardia with a heart rate 145/min after surgery. The right pleural drainage of serous fluid was found to be increasing, and a tube thoracostomy was required to drain the massive left effusion that appeared on a chest film on post-esophagectomy day 3. Leak of thoracic duct was suspected based on the increasing amount of pleural serous fluid (Fig. 2). With the intention of confirming a thoracic duct injury, 190 ml of milk was fed via a nasogastric tube on the postoperative day 5. The right pleural drainage changed from a serous appearance to creamy fluid.
Fig. 2 The amount of pleural drainage was increasing in case 2. The peak at the postoperative hour 43 led to a left tube thoracostomy being performed within 10 minutes after feeding. A diagnosis of chylothorax was made and the patient was returned to the operating theatre with urgency. The previous thoracotomy was re-opened and the right side tissues near the aorta were massively ligated. A pericardial window of 1.5 cm was made to release the tense pericardium, and 150 ml of serous fluid was drained. Pleural drainage dramatically decreased and the chest tubes were removed on the post-esophagectomy day 8. The patient’s heart rate gradually return to its preoperative rate of 100/min, and he was discharged on the post-esophagectomy day 18.

Discussion

Chylothorax is a well known complication whereby chyle leaks following esophagectomy. It increases postoperative hospital stay and medical costs, leads to malnutrition, results in more pulmonary complications, and creates a need for long-term parenteral nutrition. Early detection of chylothorax is essential for the management of the complication. Chyle is defined as intestinal lymphatic fluid that is enriched with fat (fat-soluble vitamins, chylomicrons, and triglycerides) absorbed from the intestinal lumen, which gives chyle its milky appearance after enteral feeding. Chylothorax should be suspected in the presence of excessive (>1000 mL per day) chest or mediastinal output of serous fluid continuing for more than 2 days. The absence of a milky appearance does not exclude a chylothorax, especially if the patient is fasting or on a low fat diet. Thus, the possible presence of a chylothorax should be considered in any patient who presents with a persistent or recurrent pleural effusion of obscure etiology that is turbid, bloody, or serosanguinous. The fluid’s triglyceride value distinguished chylous effusion from nonchyloous effusion; values greater than 110 mg/dl are highly suggestive of a chyloous effusion.
In our two patients, the diagnosis of chylothorax were based on the appearance of milky fluid from the chest tube drain after feeding with milk. In the second patient, the amount of pericardial fluid was 150 ml, which is significantly more than 50 ml of normal individual.

Conservative therapy with total parenteral nutrition and no enteral intake is often successful, but operative therapy should be seriously considered in patients with a persistently high daily output of more than 2 L after 2 days of optimal conservative therapy\(^{(2)}\). It is very difficult to predict whether a chylous leak will spontaneously heal and therefore treatment must be prompt and aggressive to prevent any progressive weakening of the patient, which may decrease the chance of the patient surviving this complication. A reoperation for chyle leakage is generally performed using a transthoracic approach with supradiaphragmatic duct ligation\(^{(3)}\). This aggressive attitude has the advantage that the surgeon is reoperating in a pleural space that is still free from adhesions, which makes it easier to identify the site of the chylous leak, and that the patient is not severely impaired by prolonged loss of fluid, proteins, albumin, and lymphocytes\(^{(3)}\).

Chylothorax could be associated with chylopericardium\(^{(6,7)}\). Lymph drainage from the lateral and posterior aspects and the diaphragmatic surface of the pericardium has been shown to channel into various different groups of mediastinal lymph nodes including the juxta-oesophageal group\(^{(8,9)}\). It is therefore feasible that lymphatic drainage of the heart and pericardium can be interrupted during additional mediastinal dissection, which might lead to pericardial effusion.

In conclusion, based on our experience with these two patients, we suggest that post-esophagectomy chylothorax can be diagnosed early by feeding the patients with milk, and the possibility of an associated pericardial effusion should be considered. Early detection and treatment of a chylothorax can provide the patient early recovery.

References

食道切除手術後引發乳糜胸：兩病例報告

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兩位食道癌病人接受食道切除手術後引發乳糜胸。這兩位病人在切除食道前，曾經接受化學及放射治療。第一位病人之乳糜胸診斷依據，是在食道切除手術後第8天，給以灌食牛奶而胸腔引流液變乳白色，因此她在食道切除手術後第10天，為了治療乳糜胸，接受右側第九肋迷你開胸結紮胸管，總共住院28天。第二位病人之乳糜胸診斷依據，乃是在切除食道手術後第5天灌食牛奶後，發現胸腔引流液變乳白色。之後即刻為了治療乳糜胸及心包膜積液，接受再次右側開胸結紮胸管及心包膜造口，總共住院18天。早期查覺乳糜胸還進行治療，使得病人早日康復。

關鍵詞：食道癌，食道切除手術，乳糜胸，心包膜積液