How-to-do-it

Supradiaphragmatic thoracic duct clipping for chylothorax through left-sided video-assisted thoracoscopic surgery

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Abstract

Chylothorax is a life-threatening clinical entity. Traditional surgical management for cases refractory to conservative treatment is thoracic duct ligation through a right open thoracotomy or closure of the site of duct laceration through an open thoracotomy. We report herein two patients with left chylothorax successfully treated by supradiaphragmatic thoracic duct (STD) ligation through left-sided video-assisted thoracoscopic surgery (VATS). This approach offers optimal exposure for the thoracic duct ligation and is useful for treatment of left chylothorax after left-sided thoracic surgery and idiopathic left chylothorax.

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1. Introduction

Persistent chylous leakage is a rare but serious morbidity after thoracic surgery. Conservative treatment such as fasting, low fat diet, and chemical pleurodesis have been proposed throughout the years. Although lately, video-assisted thoracoscopic surgery (VATS) has been introduced for the treatment of chylothorax [1,2]. Because of its easy manageability and low morbidity, the treatments by VATS are the repair or closure of the leakage site, fibrin glue application in the mediastinal region suspected for leakage, a talcage and right side VATS thoracic duct ligation. Surprisingly, left side VATS thoracic duct ligation has not been reported. We report new technique for supradiaphragmatic thoracic duct (STD) ligation by left-sided VATS and two patients with left chylothorax successfully treated by this technique.

2. Technique

In each case, a heavy cream is administered through a nasogastric tube 2 h before the operation in order to identify the leakage and to distend the thoracic duct. Under general anesthesia with one-lung ventilation, the patient is placed in right lateral decubitus position. The port in the seventh intercostal spaces (ICS) on the anterior axillary line (AAL) is for the insertion of the camera, while the other ports are for the working instruments. With the left lung collapsed, the pulmonary ligament is dissected if the ligament is preserved. The parietal pleura lying over the site between the descending thoracic aorta and the esophagus is divided. The esophagus is oppressed anteriorly using an endoscopic dissector in order to open the space between the aorta and the esophagus. After then, we carefully dissect the soft tissues over the thoracic vertebra in order to locate the azygos vein easily (Fig. 1). Finally, the thoracic duct is identified between the azygos vein and aorta above the level of the diaphragmatic hiatus. The thoracic duct is clipped with the use of endoscopic hemoclips (Fig. 2). A chest tube is placed in the left pleural space.

3. Clinical experience

3.1. Case 1

A 58-year-old woman with chronic renal failure on maintenance hemodialysis was admitted in another hospital due to left pleural effusion. The left thoracentesis revealed chylous pleural effusion. Chest tube placement and total parenteral nutrition (TPN) were performed, but daily volume of pleural discharge was 500 ml or more on 20 days after conservative treatment. She was transferred to our hospital for surgical treatment. She was subjected to STD clipping through left-sided VATS after three ports were placed in the
5th and 7th ICS on the AAL and the 8th ICS on the midaxillary line. Postoperatively, no persistent drainage was noted. The chest tube was removed on the 5th postoperative day (POD) and the patient was discharged on the 7th POD. She is doing well without the recurrence 2 years after operation.

3.2. Case 2

A 71-year-old man underwent VATS left lower lobectomy and systematic mediastinal node dissection for primary lung cancer. On the 2nd POD, the left chest drainage increased to 2200 ml/day and became chylous, therefore, TPN treatment was started. Daily volume of pleural discharge was over 1000 ml. The patient underwent STD clipping through left-sided VATS on the 3rd POD. In this case, a minithoracotomy (40–50 mm) was made in the 5th ICS on the AAL. Another port was placed in the 7th ICS on the AAL. We used the same skin incisions as of the previous VATS lobectomy. The chest drainage was reduced immediately and the chest tube was removed on the 5th POD. The patient was discharged on the 13th POD. He is doing well without recurrence of the chylothorax and lung cancer.

4. Comment

Thoracic duct injury occurs in 0.5—2% of the patients who undergo thoracic surgery [3]. Loss of chylous fluid following inadequate treatment causes nutritional deficiencies, respiratory dysfunction, and immunosuppression. If the daily volume of pleural discharge is 1500 cc or more under conservative treatment, the treatment is not effective [4]. Surgical strategies to control chylous leakage are direct closure of the chylous fistula, suture of the leaking mediastinal pleura, and supradiaphragmatic ligation of the thoracic duct [5]. The ligation has been usually performed through the right pleural space by VATS [6,7] even if the chylous leakage is caused by surgery due to left-sided thoracic surgery. It is because the descending aorta and esophagus are considered obstacles during the procedure. VATS renders easy identification of the thoracic duct through the left pleural space because only a narrow space is observed in the operative view which can be magnified by VATS. It is important to oppress the esophagus anteriorly using an endoscopic device. The azygos vein, which is an important anatomical landmark close to the duct, should be identified carefully in order to locate the thoracic duct. Of course, preoperative administration of a heavy cream meal is helpful for identification of the thoracic duct and the leakage site. This technique should be considered as a surgical option for patients with chylothorax after left-sided thoracic surgery and for patients with idiopathic left chylothorax.

References