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COMBINED CHYLOUS NECK FISTULA, CHYLOTHORAX AND CHYLOPERITONEUM AFTER TRANSHIATAL ESOPHAGECTOMY

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ABSTRACT

A 65-year-old man sequentially developed a chylous neck fistula, left-sided chylothorax, and chylous ascites after a transhiatal total esophagectomy for adenocarcinoma of the distal esophagus. The pathophysiology of this unusual accumulation of chyle in three separate anatomic compartments is examined.

A post-surgical chylous leak or effusion may occur in the neck, chest, or abdomen. In most patients, chyle accumulates at the level of the lymphatic duct disruption. Occasionally a lymphatic duct tear can cause effusion in a more remote compartment (e.g., chylothorax after retroperitoneal dissection) (1,2).

We describe a patient with a chylous effusion in three separate anatomic sites after transhiatal esophagectomy. The most probable site of the lymphatic ductal disruption and various therapeutic options are examined.

CASE REPORT

A 65-year-old man in whom a radical left-sided lower lobectomy had been performed for poorly differentiated squamous cell carcinoma ($pT_2N_0M_0$) six months earlier underwent transhiatal esophagectomy without retroperitoneal lymph node dissection for a poorly differentiated adenocarcinoma of the distal esophagus with positive lymph nodes along the lesser curvature ($pT_3N_1M_0$). Preoperative diagnostic evaluation of the esophageal carcinoma showed no recurrence of the pulmonary tumor. During the second postoperative day after starting enteral feeding via a needle jejunostomy, a fluid collection formed in the neck which drained spontaneously through the cervical incision. This drainage stopped abruptly the next day but the patient developed a massive left-sided chylothorax which required insertion of a thoracostomy tube. The tube yielded 4 liters of opalescent chyle which became serous after enteral feeding was stopped and replaced by total parenteral nutrition (TPN). At this time, no abdominal distension was noted. The thoracostomy tube was removed on the twelfth day postoperatively when fluid output had gradually diminished.

Twenty-six days after esophagectomy, the patient was discharged from the hospital on a medium-chain-triglyceride (MCT) diet. Over the next nine days, however, he became progressively short of breath and his abdomen became markedly distended. A plain chest radiogram showed only a mild persistent unilateral left-sided effusion. Ultrasonography confirmed the presence of a massive amount of free intraabdominal fluid. A left-sided thoracostomy tube was reinserted and approximately 5 liters of chyle was evacuated over the next 5 days, as the chyloperitoneum disappeared. The thoracic tube was removed after 14 days when fluid output had ceased. Four days thereafter the

patient was redischarged from the hospital still on a MCT diet. Although neither the chylothorax nor the chyloperitoneum had completely resolved, they no longer were symptomatic.

Three and five weeks later he again had recurrence of massive chyloperitoneum with mild residual chylothorax. A computer tomographic scan of the chest revealed a large fluid collection in the posterior mediastinum. After three weeks of TPN and repeated abdominal paracenteses, the fluid collection gradually resolved but he remained on a MCT-diet.

COMMENT

After a left-sided neck operation, disruption of the thoracic duct can result in chylous lymph fistula. Nonoperative treatment consists of TPN or an MCT-diet combined with closed wound drainage and repeated aspiration or a pressure dressing (3). Where the output persistently exceeds 600 ml/24 hours, the thoracic duct fistula should be oversewn in the neck (2-4). Attempts to seal the fistula by tetracycline sclerotherapy has also been advocated (5).

Chylothorax after an intrathoracic operation occurs in 0.2% to 0.5% of patients (6,7). After a transhiatal or transthoracic esophagectomy the incidence varies from 0.2-10.5% (8-10).

Chylous ascites after an abdominal operation usually results from injury to the cisterna chyli and/or its main tributaries. Because of its relatively protected position behind the upper abdominal aorta, cisternal lacerations are uncommon. Chylous ascites has been described after portosystemic decompression, abdominal aortic reconstruction and retroperitoneal lymph nodal dissection (1,11). Whereas a chylous pleural effusion usually becomes symptomatic on the third to fifth day after operation, chylous ascites often remains clinically unrecognized.

Most authors recommend thoracic duct ligation for chylothorax after 1-2 weeks of

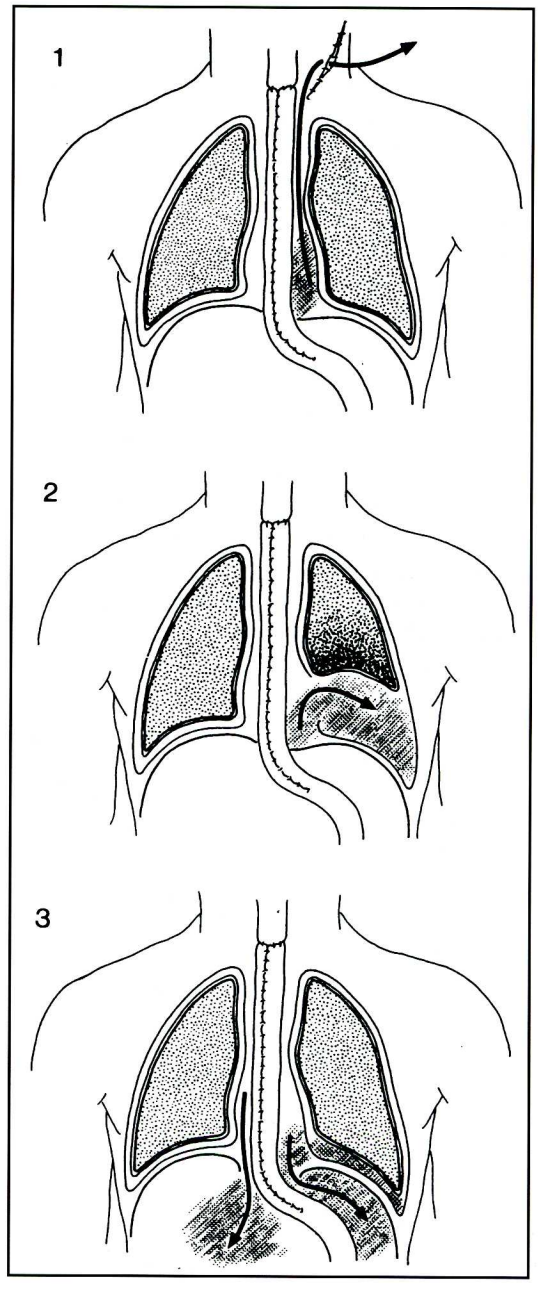

Fig. 1. Proposed mechanism of chylous leakage after transhiatal esophagectomy. 1) Initially lymph fluid collected and spontaneously drained in the neck through the iatrogenic mediastinal tunnel created by operative dissection. 2) Development of left-sided chylothorax after the pleura disupted with spontaneous closure of the cervical lymph fistula. 3) With gradual sealing of the pleural cavity, chyle preferentially accumulated within the abdomen.

unsuccessful thoracostomy drainage and TPN before infection and malnutrition supervene (9,12,13). Non-operative treatment of chyloperitoneum after an abdominal operation, however, should be more prolonged (11,14); because spontaneous closure of the fistula usually occurs and attempts to ligate or repair leaking abdominal lymphatics have a low success rate. Where the condition of the patient deteriorates, however, insertion of a peritoneo-venous shunt may be considered but the benefits should be weighed against the potential complications of shunt occlusion, occult sepsis, and disseminated intravascular coagulation (11,14,15).

In the patient reported here, a chylous leak initially occurred in the neck but as the chylothorax developed the cervical lymphatic cutaneous fistula closed. Probably after transhiatal total esophagectomy, the pleura was intact and the lymphatic ductal leak initially drained via the neck incision through the iatrogenic mediastinal tunnel. After two days, the pleura likely disrupted on the left resulting in a left-sided chylothorax. During the next few weeks, the defect between the posterior mediastinum and the pleural cavity gradually sealed and the chylous leakage preferentially now accumulated in the abdominal cavity *(see Fig. 1)*. The transhiatal surgical approach had not allowed for an extensive lymph node dissection in the posterior mediastinum. Residual mediastinal lymph node involvement may have contributed to lymphatic outflow resistance and persistence of the chylous leakage.

This patient's clinical course illustrates that after a radical operation in three separate compartments (i.e., neck, chest, abdomen) the site of chylous leakage and accumulation does not necessarily correspond with the actual site of lymphatic disruption. In this instance, the most likely structure injured during the "blind" esophagectomy within the posterior mediastinum was the thoracic duct. Conventional lymphography and/or lymphoscintigraphy may have delineated the site of lymphatic ductal disruption (12,16-18) and with earlier recognition and localization, ligation of the thoracic duct would probably have been performed after a limited period (e.g., two weeks) of unsuccessful nonoperative management.

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