showed that the hydrothorax generally results from movement of the ascitic fluid into the pleural space through congenital defects in the diaphragm.¹ Newer work indicates the involvement of inflammatory cytokines in the formation of hydrothorax and ascites.⁵

The development of a pericardial effusion in our patient seems a novel finding. Such effusions do not seem to have been looked for in patients with true Meigs' syndrome. The possibility of an ovarian lesion needs to be explored in any woman with unexplained pericardial effusion.

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Chylothorax after coronary artery bypass surgery

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CARDIOTHORACIC SECTION, NOVEMBER 2004

Certain anatomical anomalies predispose to chylothorax when the left internal mammary artery is harvested for coronary artery bypass grafting (CABG).

CASE HISTORY

A woman of 68 was admitted for elective CABG and closure of a secundum atrial septal defect.

At surgery, the left internal mammary artery was harvested in the standard manner with use of electrocautery

and ligature to create a pedicled graft. It was short but had a good calibre and flow. Cardiopulmonary bypass was established, the right atrium was opened and the atrial septal defect was repaired with an autologous pericardial patch. After anastomosis to the mid-left anterior descending coronary artery, the pedicled graft was found to be under tension. It was further mobilized as high as possible but remained 'tight'; therefore it was divided proximally and anastomosed end to side into the right coronary artery vein-graft. Bypass was discontinued and the chest was closed in routine fashion.

Her initial postoperative course was uneventful but on the third day a creamy chylous discharge emerged from her left pleural drain. A triglyceride concentration of 4.83 mmol/L in this fluid, compared with 1.19 mmol/L in plasma, confirmed chylothorax. She was placed on a low fat diet with medium chain triglycerides and the chest drain output was monitored daily; but when the drain was clamped, lymph reaccumulated in the left pleural space. At video-assisted thoracoscopy five weeks postoperatively, pleurodesis was performed with 8 g of talc and a single drain was placed in the left pleural space without suction. This drain was removed three days after the procedure. On review three weeks after discharge there was no clinical or radiographic evidence of chylothorax recurrence.

COMMENT

Chylothorax, the result of leakage from the thoracic duct or one of its main tributaries,¹ is a rare complication of CABG.^{2,3} In an anatomical study, Riquet *et al.*⁴ reported that the left anterior mediastinal lymph node chain normally connects with the left jugulosubclavian venous junction. In its course it crosses the left internal mammary artery near its origin at the apex of the thorax. They also found that the left anterior mediastinal lymph node chain sometimes connects with the arch of the thoracic duct near its termination (Figure 1). Normally, lymph vessels are valved and lymph back-flow is impossible.⁵ Chyle valve insufficiency, if present, may allow back-flow from the thoracic duct,⁵ but injury to a back-flowing left anterior mediastinal lymph node chain that is connected to the thoracic duct (and not the left jugulosubclavian) is a more likely explanation for chylothorax complicating left internal mammary artery harvesting, in view of their close anatomical relation. It does not happen often because the valves within the chain are usually competent and the chain is not usually connected to the thoracic duct.⁵ Brancaccio *et al.*² have therefore suggested that lymphatic injury in patients undergoing left internal mammary artery harvesting occurs at the time of dissection performed to maximize the conduit's length near the proximal end of the pedicle.

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Figure 1 Cross-section of left hemithorax. Note drainage of the left anterior mediastinal lymph node chain into the venous confluent and thoracic duct and its close relation to the origin of the superior part of the thorax. (Adapted from Ref. 4)

Direct injury to the thoracic duct itself during such harvesting is rare because of the anatomical position of the subclavian vein.⁶ The thoracic duct is also protected by being more deeply located in this region.⁵

Treatment of chylothorax can be difficult.⁵ Initial management includes continuous closed chest drainage and a diet with medium-chain triglycerides (which are absorbed directly into the portal system rather than into the intestinal lymphatics).⁶ The principles are to minimize chyle formation, prevent immunodeficiency and maintain adequate drainage and nutrition.² For patients with a small leak, a simple talc pleurodesis via the chest drain can be attempted.⁶ Talc powder induces an intense inflammatory response with sealing of the leak by adhesion and fibrosis.⁶

Surgical intervention is recommended if the leakage persists for more than three weeks, if the daily loss exceeds 1.5 L, if loculation is present or if nutritional complications are imminent in a debilitated patient.² The operation can be open or thoracoscopic, as in the present case. Sometimes the site of

leakage is more readily identified if the patient consumes some cream mixed with Sudan black before the operation.³

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