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EDITORIAL (BY INVITATION)

Editorial: postoperative chylothorax—a cause for concern

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In this issue of *Acta Neurochirurgica*, Bae et al. [2] describe a case with bilateral chylothorax after right-sided anterior cervical spine surgery. The diagnosis of chylothorax was made by detecting chyle leakage from the surgical neck incision as well as chest x-rays and fluid analysis from pleurocentesis. This complication has not been reported previously in conjunction with a right-sided surgical approach in the neck, but there are several case reports of chylothorax after left-sided neck incisions in association with thyroid surgery or radical neck dissection for cancer [4]. It is also a rare but well-known complication after thoracic surgery such as pneumonectomy, lobectomy, esophageal surgery and even after heart surgery [1, 3]. Chylous leakage after surgical trauma may accumulate in the pleural space (chylothorax) or around the heart (chylopericardium). Normally, chylous fluid in the pleura is milky white, but it may be serous or serosanguineous depending on the fasting state of the patient.

Left-sided neck incisions may cause injury to the thoracic duct, which normally enters the systemic venous circulation at the junction of the left subclavian vein and the internal jugular vein. As pointed out by the authors, anatomic variations are common, such as the thoracic duct entering on the right side or the presence of a large accessory right lymphatic duct, which may be injured during surgery. In fact, it is old knowledge that the anatomy of the thoracic duct is constant only in its variability [5]. The mind twister in the current case is the bilateral chylothorax caused by a unilateral right-sided neck incision. Two mechanisms are plausible: First, there may be leakage of chyle from an injured larger lymphatic vessel in the neck that subsequently drains downwards into the mediastinum or through the pleural cupolae, allowing chylous fluid to accumulate directly in both pleural spaces or causing inflammatory reaction and pleural effusion. Second, in making and closing the neck incision, the thoracic duct or a large right accessory lymph vessel may be injured and obstructed, causing both chyle leakage in the wound and a significant rise in pressure in the thoracic duct more proximally in the mediastinum. As chyle production may be several liters per day, this build-up of proximal duct pressure, combined with the negative intrapleural pressure, may cause secondary rupture of the mediastinal pleura and chyle leakage through fistulas into both pleural spaces, as the thoracic duct normally switches sides during its course through the posterior mediastinum.

Chylothorax may accumulate in excess of 500–1000 ml per day and is therefore a potentially dangerous complication. It may linger on for days or weeks, putting the patient at increased risk of respiratory dysfunction (pleural fluid compressing the lung(s) necessitating repeated drainage), malnutrition (loss of fats, albumin, nutrients and vitamins) and infection (loss of lymphocytes and immunoglobulins). Therefore, as noted by the authors, prompt diagnosis and treatment are important. Diagnosis may sometimes be unclear, but a positive pleural fluid analysis should include high triglyceride content, cytologic findings of lymphocyte predominance and negative cultures. Lipoprotein electrophoresis may be an important tool for a positive diagnosis, showing chylomicron content. First-line therapy is usually altered diet with medium-chain triglycerides (to reduce chyle production) and administration of somatostatin, but may require nothing per os and total parenteral nutrition. Further diagnostics of the chyle leakage location may be necessary by means of lymphangiography. Most cases will presumably resolve with conservative treatment. However, if this

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strategy is unsuccessful, especially in high-output or long-lasting chylous leaks, thoracic surgery may be needed with direct suture of the leakage or complete ligation of the thoracic duct. This is performed from the right side, by either an open approach or video-assisted thoracoscopic surgery. The duct can be more easily visualized by giving the patient cream or methylene blue per os just prior to the surgery.

The authors are to be commended for making the neurosurgical community aware of this exceedingly rare but potentially dangerous complication in conjunction with anterior cervical spine surgery. If suspected, early consultation with thoracic surgeons should be recommended.

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