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Bilateral thoracic duct ligation for persisting postoperative chylothorax

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Abstract

Herein, we report the case of a patient with persistent postoperative chylothorax despite right supradiaphragmatic ligation of the thoracic duct. Computed tomography lymphangiography after lipiodol injection demonstrated a correctly ligated right thoracic duct but an anatomical variation with patent left-sided thoracic duct, which was successfully ligated afterwards by video-assisted thoracic surgery.

Keywords: Chylothorax • Treatment • Lipiodol lymphangiography

INTRODUCTION

Chylothorax (Cx) is a complication occurring in 1.4% [1] to 1.9% [2] of anatomical lung resections. The risk of thoracic duct (TD) lesion depends on its location, which is variable and can be bilateral in up to 10.6% of patients [3]. The management of postoperative Cx combines conservative, interventional and operative treatment. We describe a case with persistent Cx despite surgical ligation of the right TD.

CASE

We performed an open lower bilobectomy with radical mediastinal lymphadenectomy on a 60-year-old man, for a stage IIIA squamous cell carcinoma with a good response after neoadjuvant chemotherapy.

On the first postoperative day, a large amount of milky fluid was seen in the chest tube. Triglyceride levels in the pleural fluid were elevated to 394.7 mg/dl confirming the diagnosis of Cx. The patient was set nihil by mouth and total parenteral nutrition was initiated with no success after 11 days.

Open supradiaphragmatic ligation of the TD on the right side was performed on day 12, but the Cx persisted.

On day 20, a computed tomography (CT) scan lymphangiography after injection of lipiodol in both groins under ultrasound guidance showed the interruption of the contrast medium at the

level of the TD ligation on the right side, at the same time it showed persistence of chylous passage through a left-sided TD (Fig. 1).

On day 22, we proceeded to left thoracoscopic TD clipping with a resolution of the Cx (Video 1).

DISCUSSION

Bilateral TD is rare but this variation can be challenging for the management of a postoperative Cx. Cx can persist despite a correct surgical ligation of the TD because of chyle flow coming from the contralateral side. In such cases, a CT scan lymphangiography can be very helpful for the diagnosis of anatomical variations, guiding the operation in case of operative therapy, and sometimes this examination has even a therapeutic effect due to a coiling-like-effect of lipiodol [4].

In the literature [1, 5], a couple of clinical features are shown to be risk factors for the development of postoperative Cx. Retrospectively, our patient showed multiple of these features: right-sided operation and neoadjuvant chemotherapy or N2 disease, both known to increase the risk for this particular complication.

The management of iatrogenic Cx is based on stepwise conservative and operative approaches. Bryant *et al.* [1] proposed an algorithm to choose which patients could benefit from a conservative treatment based on the quality and quantity of

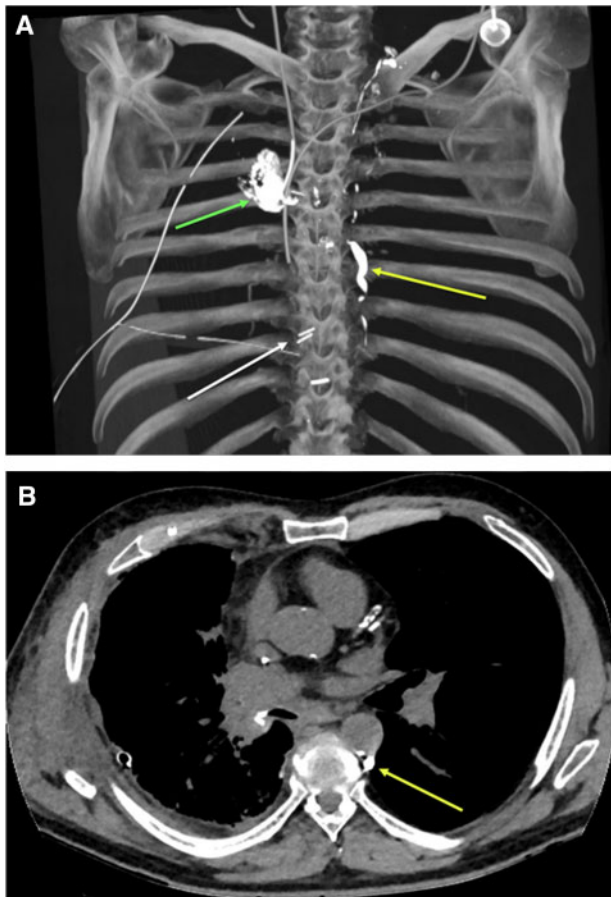
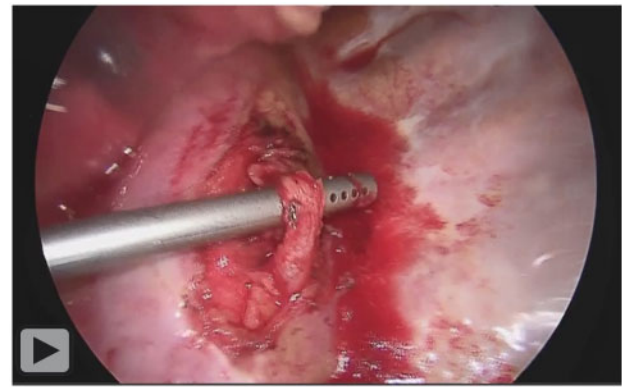


Figure 1 (A) 3D reconstruction of the computed tomography (CT) scan lymphangiography after lipiodol injection showing the ligated right thoracic duct (TD) (white arrow) and the patent left TD (yellow arrow). The green arrow shows the chylous collection in the right chest cavity. (B) View of the axial plane of the CT scan lymphangiography showing the patent left TD (yellow arrow) posteriorly and laterally to the descending aorta.

the chest tubes output. In this study, up to 90% of cases were resolved with a conservative treatment, allying medium-chain glyceride diet and regular clinical and radiological controls. The use of somatostatin or its synthetic equivalent octreotide remains controversial: In a prophylactic study, it did not reduce the appearance of Cx but seemed to reduce the total amount of secreted fluid [5].

CONCLUSION

Due to its diagnostic and therapeutic value, CT scan lipiodol lymphangiography has the potential to become the first step in the stepwise management of postoperative Cx. It would be worth to evaluate a



Video 1: Thoracoscopic ligation of the left thoracic duct. Since the patient had contralateral bilobectomy it was necessary to apply jet ventilation and to intermittently allow the lung to re-expand for proper oxygenation. The histology of the resected duct segment confirmed it to be thoracic duct-tissue.

decision tree implementing this useful tool. Before more evidence has been gathered, surgeons should consider this method as a possible diagnostic and sometimes as a therapeutic tool for persistent Cx cases.

Conflict of interest: none declared.

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