



Therapeutic Lymphography for Persistent Postsurgical Chylothorax

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Abstract

Post-operative chylothorax is a rare but noxious complication which treatment can be medical, surgical or radiological. We reported a post-operative chylothorax after a right lower lobectomy which failed to be managed surgically and were successfully treated by Lipiodol[®] lymphangiography. The Lipiodol[®], an old but known contrast agent was both used for imaging and treatment purposes.

Introduction

Chylothorax is a pleural leakage of Chyle, an infrequent post-operative complication which treatment is first conservative starting with drainage of the effusion, reduction of the lymphatic flow that can be achieved by parenteral nutrition or medication. If this approach fails, surgical treatment can be considered with the ligation of the thoracic duct or a Lipiodol[®] lymphangiography that can be associated with a glue embolization. We would like to report the case of a 77-year-old patient who underwent a right lower lobectomy.

Case Presentation

A 77-year-old patient underwent a right lower lobectomy with lymph node dissection for primary lung adenocarcinoma staged cT2N0M0. The surgery was performed through robotic-assisted approach. Post-operative follow-up was complicated by a chylothorax, with chest tube output above 1000 ml per day despite low-fat regimen. The patient underwent revision thoracoscopy on postoperative day 10, allowing direct visualization of the leak on the laterotracheal lymphatic vessels (4R), additional lymphostasis, ligation of the thoracic duct, and talc pleurodesis. Despite the surgical revision, the chest tube output remained above 500 ml per day. The case was re discussed in multidisciplinary meeting, and a diagnostic and therapeutic lymphography was decided. On both side, direct puncture of inguinal lymph nodes was performed with a 20 G needle under ultrasound guidance, and 10 ml of Lipiodol[®] (Guerbet, Aulnay sous-bois, France) were injected under scopic guidance. Two control scans were performed 1 and 3 h after the injection confirming the ligation of the thoracic duct by a surgical clip, the opacification of lymphatic collateral that communicate with the laterotracheal lymphatic vessels (Figure 1A, 1B), and the persistence of a mediastinal breach with extravasations of the contrast agent in the pleura (Figure 1C, 1D). The evolution was marked by the progressive drying of the effusion (250 ml at D3, 180 ml at D4) allowing chest tube removal on D6.

Discussion

Chylothorax is a pleural leakage of Chyle, a lymphatic fluid enriched with fat that is produced by the small intestine, and then circulates from the abdomen, through the thoracic duct, and to the left subclavian vein. Chyle can pour into the pleural cavity following a direct breach of the thoracic duct, or more frequently following a breach of an incontinent collateral vessel. The most common causes of chylothorax are medical, including innominate vein thrombosis and mediastinal lymphoma, and iatrogenic, mostly following thoracic surgery, including esophagectomy and mediastinal lymph node dissection. The initial management of a chylothorax is usually conservative, with drainage of the effusion, reduction of the lymphatic flow that can be achieved by parenteral nutrition or medication (Somatostatin or Octreotid), and electrolytical support [1,2]. When conservative treatments fail,

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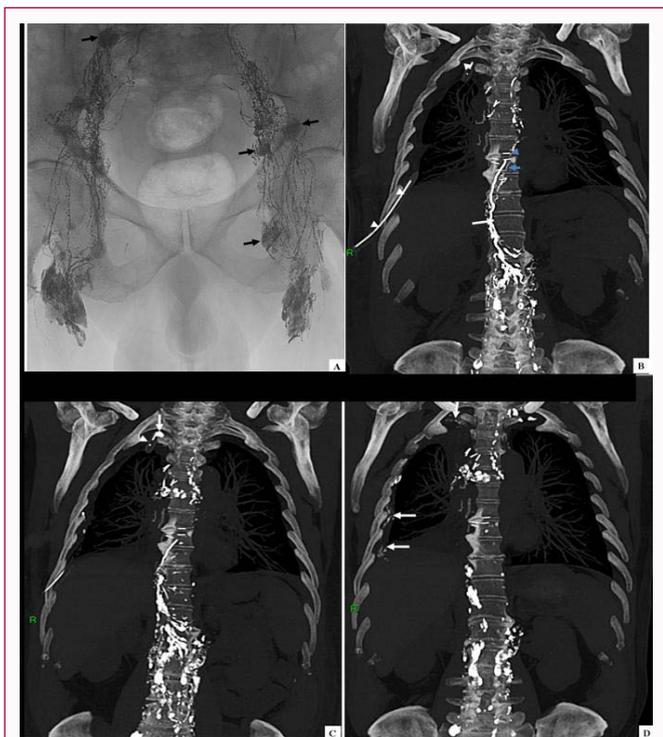


Figure A: X-ray illustration of a bilateral inguinal lymph node injection of 10 ml of Lipiodol® with the stagnation of the product in the nodes (black arrows →).

Figure B: CT Reformatted MIP coronal image (70 mm) showing the chest tube (head white arrow) and the progression of the Lipiodol® in the thoracic duct (white arrows) 1 hour after the injection with mediastinal filling of the lymphatics. (H1). The head blue arrow shows the surgical clip applied on the thoracic duct during surgical thoracic duct ligation. The blue arrow shows the collateral lymphatic vessel perpetuating the chylothorax.

Figure C: CT Reformatted MIP coronal image (70 mm) showing the leak of the Lipiodol® in the right pulmonary apex (white arrow) and next to it the chest tube (head white arrow) 3 hours after the injection. (H3). There is more opacification of the right pulmonary hilum suggesting a leak around this area.

Figure D: CT Reformatted MIP coronal image (70 mm) showing residual Lipiodol® in the right lateral pleura and the right pulmonary apex (white arrows) 2 weeks after the injection (D14).

a surgical or interventional approach can be considered. One of the most effective surgical approaches is the ligation of the thoracic duct with or without a pleurodesis [2-5]. The main problem, in addition to general anesthesia, is to identify the thoracic duct that is subject to anatomical variants. Thoracic duct ligation is associated with a success rate between 77% and 100% but also with significant morbidity and mortality (14% and 1%, respectively) [6]. The identification of the lymphatic leakage can be demonstrated by two different imaging techniques which are Magnetic Resonance Lymphangiography and Lipiodol' Lymphography. The interpretation of Magnetic Resonance

Lymphangiography requires a certain expertise, whereas Lipiodol' lymphangiography requires a certain ability to inject Lipiodol'. Recently, the Lipiodol' injection technique has been modified from the denudation of lymphatic ducts on the back of the foot to direct injection via puncture of the inguinal lymph nodes under ultrasound guidance. Surgery, whose objective is the ligation of the thoracic canal, which is difficult to visualize, has a success rate between 77% and 100%. This procedure more invasive is performed on patients with significant morbidity and mortality (14% and 1%, respectively) [6]. In an increasing number of patients with lymphatic leakage, Lipiodol' lymphangiography has a therapeutic effect due to an inflammatory action that contributes to the healing of the lymphatic breach [6]. According to a systematic review including 7 original series and a total of 195 patients, the clinical success rate of therapeutic lymphangiography alone is 51% to 100% [6]. Patients included in this review presented a lymphatic breach with an output ranging from 10 to 3700 ml per day. The lymphatic leakage was stopped within 2 to 31 days. Complications linked to interventional procedures are rare, and include allergies, bleeding, embolization of lipiodol' mixed with glue in systemic circulation [6]. If diagnostic/therapeutic lymphangiography with Lipiodol' is not effective, intravascular embolization using coils and/or glue via cannulation of a lymphatic vessel (thoracic duct or Cisterna Chyli) guided by CT scan, can be considered.

Conclusion

Diagnostic and therapeutic lymphangiography with Lipiodol' is an easy to perform technique in the management of medical chylothorax, which can be effective in the management of postoperative chylothorax.

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