Diagnostic and Therapeutic Value of Lymphography in Persistent Postoperative Chylothorax
Supported by AXIOM Luminos *d*RF

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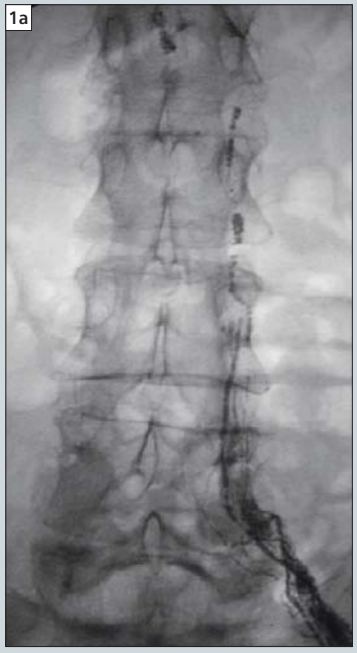
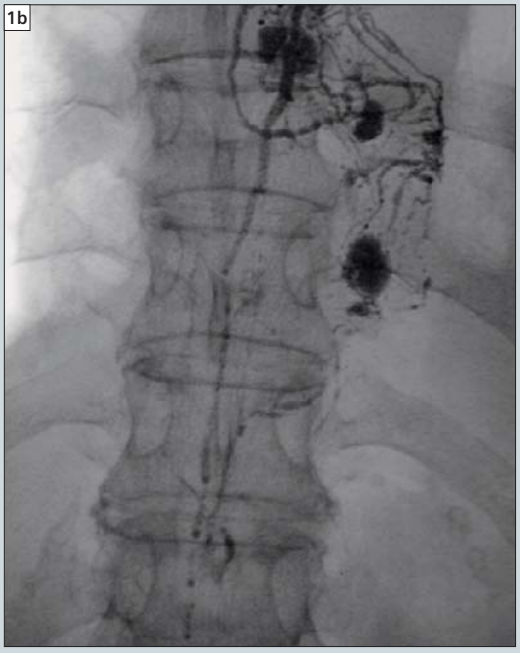
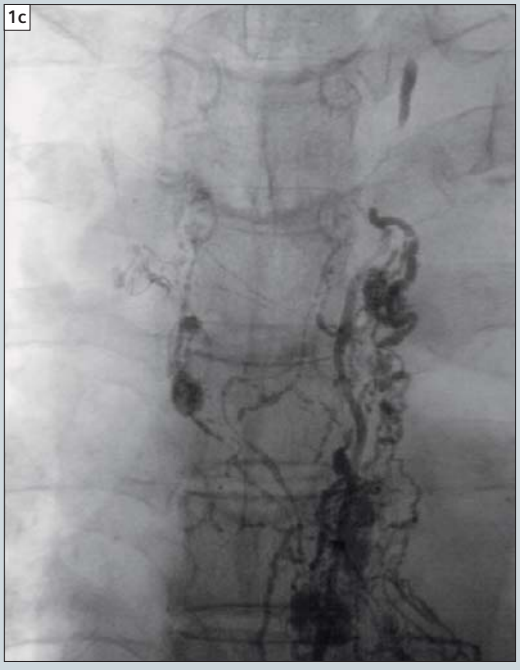
In the past, conventional lymphography (LAG) has been the gold standard for imaging the lymphatic system. With the introduction of cross-sectional imaging techniques, especially computed tomography (CT) and magnetic resonance imaging (MRI), the number of lymphographic investigations has declined markedly.
However, conventional lymphography demonstrates an important role in the diagnosis and management of lymphatic circulatory disorders, especially in the exact anatomical visualization of lymphatic leakage.
What's more, conventional lymphography has a valuable place in its therapeutical use, as the applied contrast agent lipiodol (48% iodinated glycerol ester) can suspend the egression of chyle by inducing an inflammation at the site of outflow which leads to a saponification of the surrounding fat tissue.

At the Center of Radiology at the University Hospital Giessen, lymphography is a routine procedure. The center performs about 40 to 50 lymphography examinations per year.







1a–c Unremarkable view of iliac and para-aortic lymph vessels (1a) and the cisterna chyli (1b) with thoracic duct contrasted segmentally (1c).

Patient History

58-year-old male initially presented with persistent cough. The man has been a smoker for 30 years. His cigarette consumption is estimated at 20 pack years*.

Procedure

Status was assessed using X-ray imaging of the thorax. This confirmed suspicion of a central mass. Computed tomography of the thorax was recommended for further clarification.

The CT exam of the thorax showed suspect lymph node enlargements in the mediastinal region with indication for thorascopic lymph node removal.

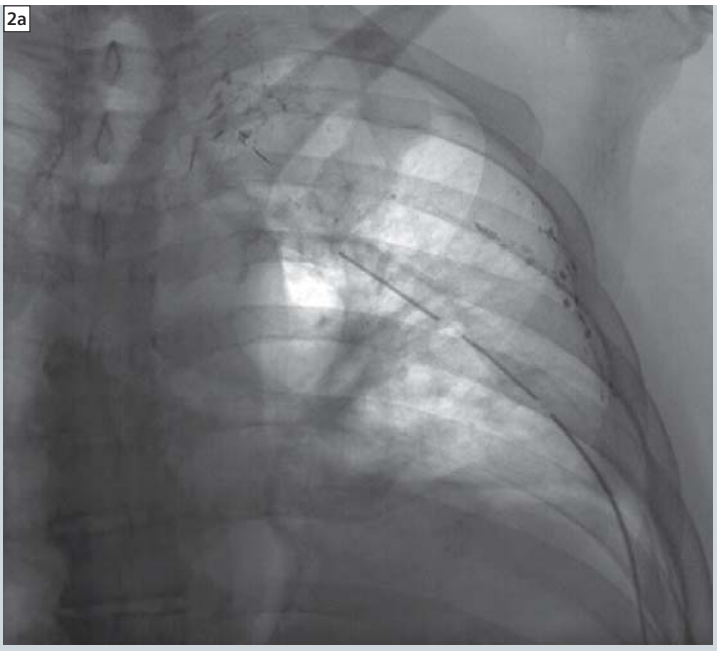
Two days postoperative of lymph node removal, X-ray check of the thorax revealed bilateral pleural effusion. After puncture of the effusion, the patient was diagnosed with a chylothorax.

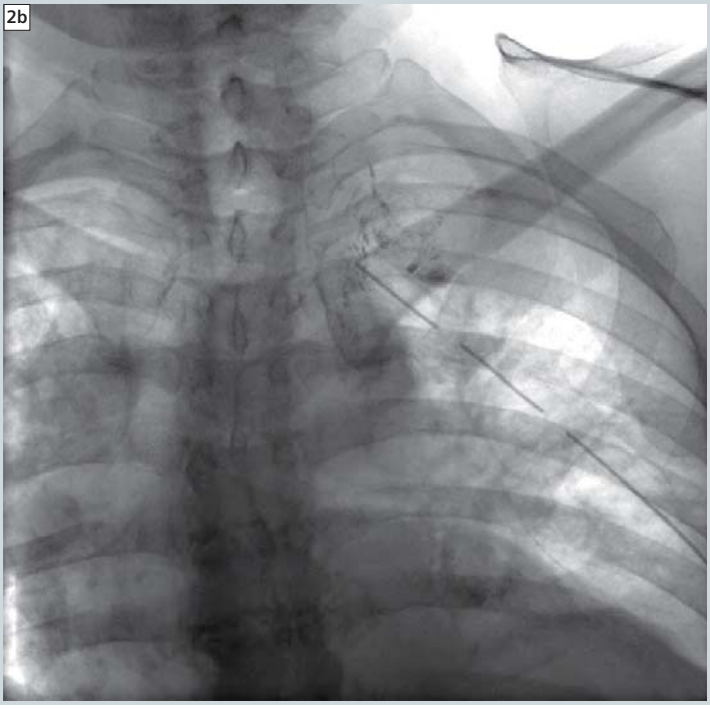
Diagnosis

Chylothorax with indication for therapeutic lymphography.

Lymphography procedure

After local cutaneous disinfection, a mixture of 5 ml of 1% Lidocaine and





"We are using the AXIOM Luminos *d*RF for the whole spectrum of fluoroscopy examinations including diagnostic angiography studies. The system is very intuitive to use – from system handling to post-processing. And the image quality is outstanding."

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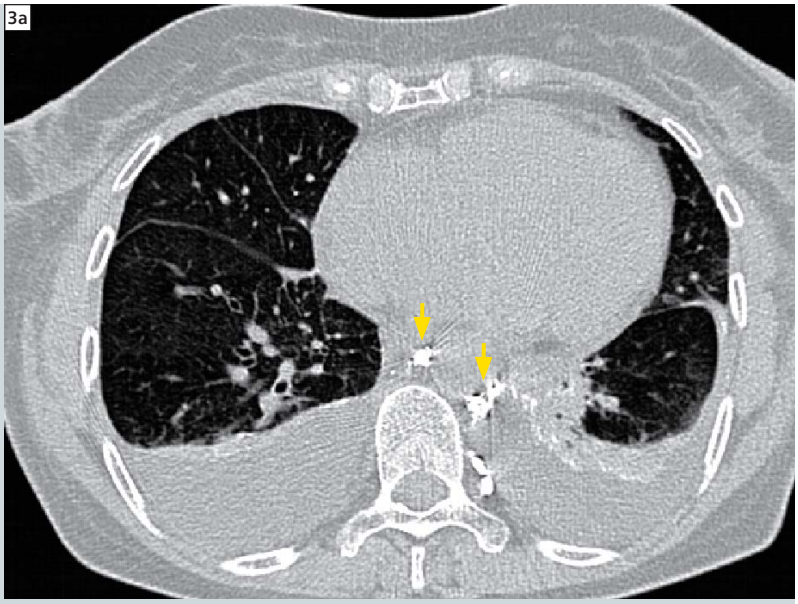
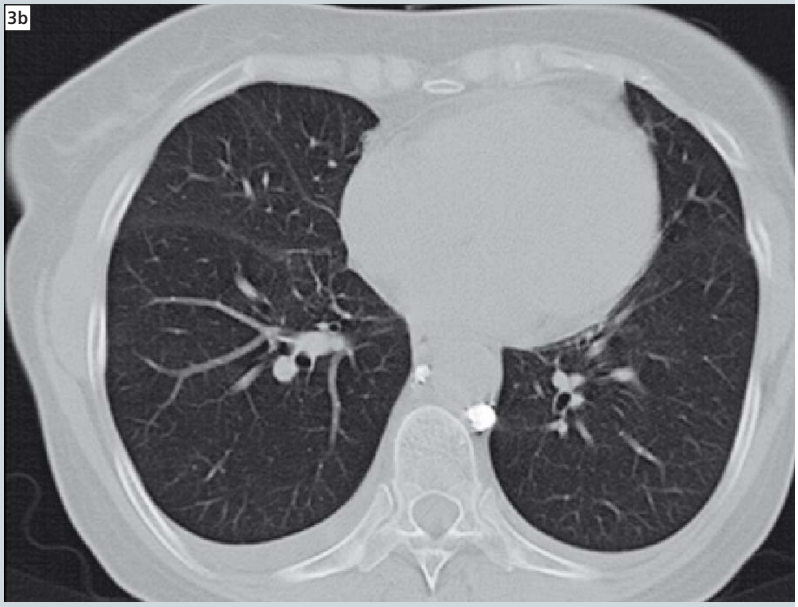
2a–b Contrast agent containing lipiodol exits into the pleural cavity (2a, 2b). A flow of contrast agent into the venous angle is not detectable under fluoroscopy (2b).

5 ml of methylene blue dye was injected into the cutaneous and subcutaneous tissues of the first and second interdigital space.
The subcutaneous lymphatic vessels are identified through the skin after almost 10 minutes. Via a longitudinal cutaneous incision, a vessel lateral to the base of the first metatarsal is exposed.
The surrounding tissues are stripped, thereby giving good access to the lymphatic vessel, which is then cannulated. Needle and infusion line are secured with adhesive strips. Once having secured access to the vessel, up to 1 ml/10 kg body weight per foot, not exceeding a total volume of 14 ml of lipiodol (48% iodinated glycerol ester) is applied, using an injector with an injection speed of 4–7 ml/h. After the injection is completed, the materials are removed and the wound is cleansed, sutured, and covered with adhesive bands. Sutures may be removed at 7–10 days post-intervention.

Results

Under fluoroscopy control unremarkable presentation of the lymph vessels of the left leg, the lymph channels, as





3a–b Initial post-lymphography CT check shows bilateral pleural effusions (chylothorax). The arrows indicate lipiodol in the mediastinal, para-aortic lymph nodes (3a). Significant reduction of the chylothorax ten days after lymphography; the contrast agent with lipiodol is still detectable in the mediastinal lymph nodes (3b).

well as the iliac and para-aortic lumbar lymph nodes. The cisterna chyli is displayed normally at L1/L2. At T4, contrast agent exits into the mediastinum and the pleural cavity. A flow of contrast into the venous angle was not detectable.

The flow rate of the Bülau drain at the time of the examination was approximately 400 ml lymph per day.

On the second day after the lymphography there was already a significant reduction in the flow rate to approx. 200 ml.

The Bülau drain was removed 10 days after the lymphography. Subsequent CT scan showed a significant reduction in volume of the chylothorax.

* Pack years:
A way to measure the amount a person has smoked over a long period of time. It is calculated by multiplying the number of cigarettes smoked per day by the number of years the person has smoked.
Number of pack years:
(Number of cigarettes smoked per day x number of years smoked)/20

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