

Thoracic Duct Embolization: Anatomy and What an Interventionalist Should Know



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Introduction:

Thoracic duct embolization is performed for the evaluation and treatment of traumatic, atraumatic, and iatrogenic chylothorax. Minimally invasive thoracic duct embolization was developed as an alternative to surgical options. The treatment consists of diagnostic pedal lymphangiography, followed by transabdominal catheterization of the thoracic duct and embolization of the thoracic duct proximal to the chyle leak.¹ Potential advantages include the minimally invasive nature of the procedure, which results in reduction of mortality and morbidity, as well as the ability to identify chyle leaks and variations in thoracic duct anatomy.^{1,2}

Indications:

Patients with clinically significant chylothorax, chylopericardium, or post-surgical chyle leaks who fail conservative management. Clinically significant chylothorax can also arise from underlying disease including tuberculosis, sarcoidosis, or lymphoma.^{2,3}



Figure 2:
Fluoroscopic image of the thoracic duct after embolization, with microcoils and Truefill glue.⁵



Figure 3:
Pre-procedure MR lymphangiography identifying abnormal lymphatic connections to the left pleural space.⁵

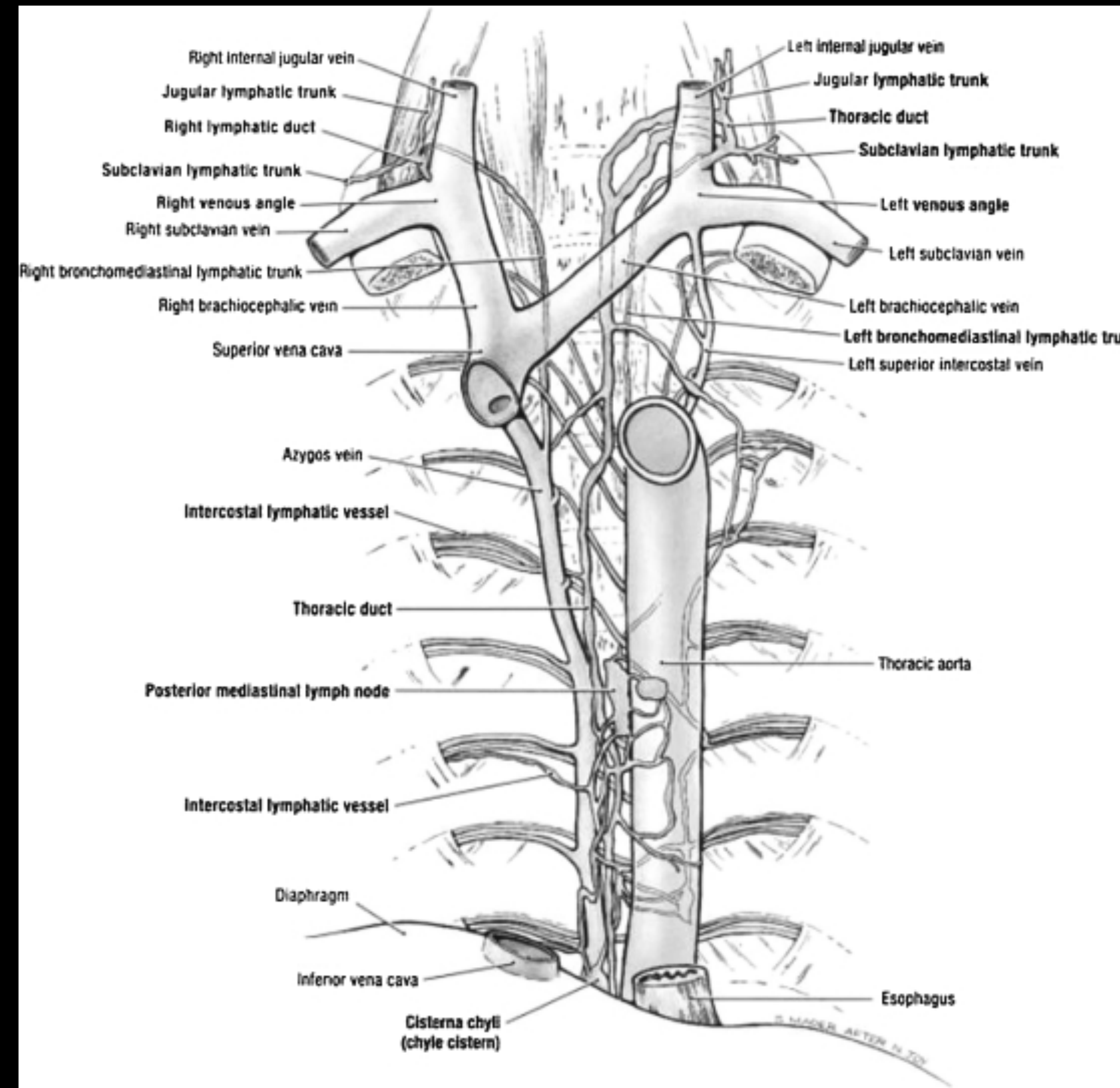


Figure 1: Anatomic rendering of the thoracic duct.⁴

Procedure:

1. After identification of the cause of chyle leakage (extravasation or obstruction), embolization of the TD is performed proximally.
2. Coils are placed to provide a matrix for glue polymerization.
3. D5W is used to flush the catheter to prevent intracatheter glue polymerization.
4. n-Butyl cyanoacrylate (n-BCA) diluted 1:1 in Ethiodol is used for embolization.
5. The TD is filled with the glue mixture just proximal to the leak or occlusion.
6. Immediately after glue injection, the microcatheter is removed.
7. The foot incisions are closed with at least three vertical mattress sutures each, and the percutaneous access site is dressed with a bandage.^{5,6}

Contraindications:

Thoracic duct catheterization and embolization in patients with nonvisualization of the cisterna chyli or thoracic duct (18%) or inability to catheterize the thoracic duct (12%).¹ Additionally, significant major lower vessel venous occlusion should be ruled out prior to thoracic duct embolization.^{3,6}

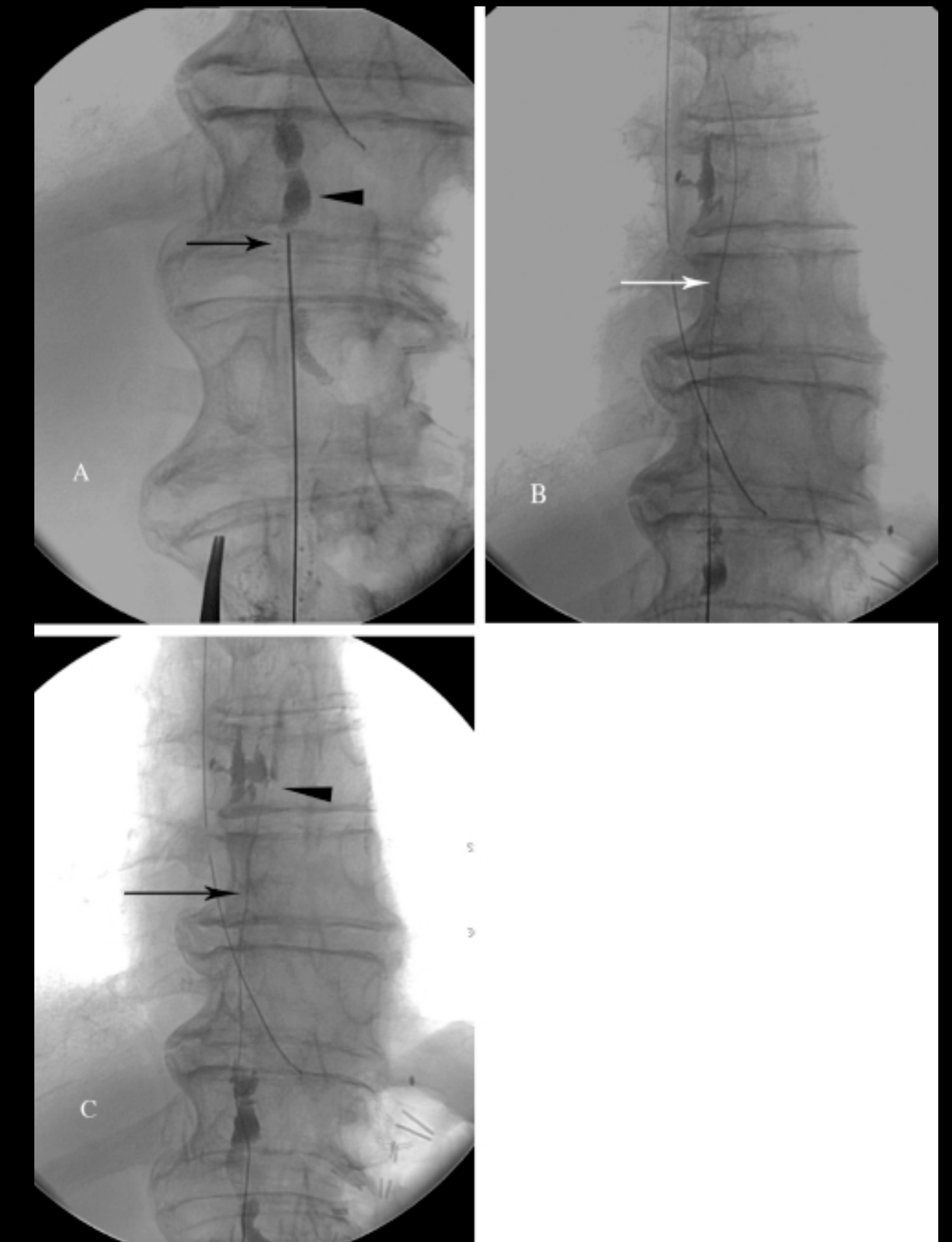


Figure 4:
Technical steps of thoracic duct embolization. (A) Fluoroscopic image of the access of the cisterna chyli (arrowhead) with a 21-gauge needle. (B) Fluoroscopic imaging of the V-18 wire advanced into the thoracic duct (arrow). (C) Injection of the contrast into the thoracic duct through the catheter (arrow) to identify the chylous leak (arrowhead).¹

References:

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