

Targeted Lymphatic Duct Embolization Can Be a Safe Alternative to Thoracic Duct Side-Branch Injury in Patients with a Chylothorax

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Introduction

- Chylothorax is the accumulation of chyle in the pleural space, commonly due to trauma (including iatrogenic), malignancy, or idiopathic causes [1].
- Iatrogenic etiologies, particularly post-surgical, account for up to 50% of cases [1].
- In rare cases, chylothorax may develop from chylous ascites ascending into the pleural space via pleuroperitoneal shunting.
- Management ranges from conservative measures (e.g., dietary modification, TPN) to intervention, depending on output volume and etiology.
- High-output chylothoraces often require procedural treatment due to poor response to conservative therapy [1].
- Thoracic duct embolization (TDE) is standard via transvenous or percutaneous access.
- In select cases, selective lymphatic duct embolization (SLDE) can target injured side branches while preserving main thoracic duct patency.
- We present a case of post-lung surgery chylothorax successfully treated with SLDE, avoiding full duct embolization.

Case Presentation

- Patient:** 56-year-old male, history of smoking; 2.7 cm right upper lobe lung nodule found incidentally post-MVC.
- Diagnosis:** Lung adenocarcinoma confirmed via EBUS-guided biopsy; PET/CT showed no metastasis.
- Primary Event:** Underwent VATS wedge resection and chest tube placement.
 - Complication:** On POD2, developed high-output chylothorax (>1L/day); mild respiratory distress noted.
- Initial Management:** Conservative therapy with octreotide and low-fat diet trialed for 5 days — minimal improvement.
- IR Intervention:**
 - Bilateral inguinal lymphangiography via 25G needle and lipiodol injection.
 - Cisterna chyli accessed percutaneously under fluoroscopy.
 - Thoracic duct cannulated; lymphangiography showed leak from a side-branch (main duct intact).
 - Super-selective embolization of the injured side-branch with lipiodol-glue (3:1).
 - Post-embolization imaging confirmed resolution of leak, preserved main duct patency.
- Outcome:**
 - Rapid clinical improvement.
 - Chest tube removed, discharged 2 days post-embolization.
 - 2-week follow-up: complete resolution on chest X-ray, no complications.

Figures



Figure 1: After ultrasound guided puncture of several bilateral inguinal lymph nodes with 25G needles, lipiodol was injected and pelvic lymphangiography was obtained.

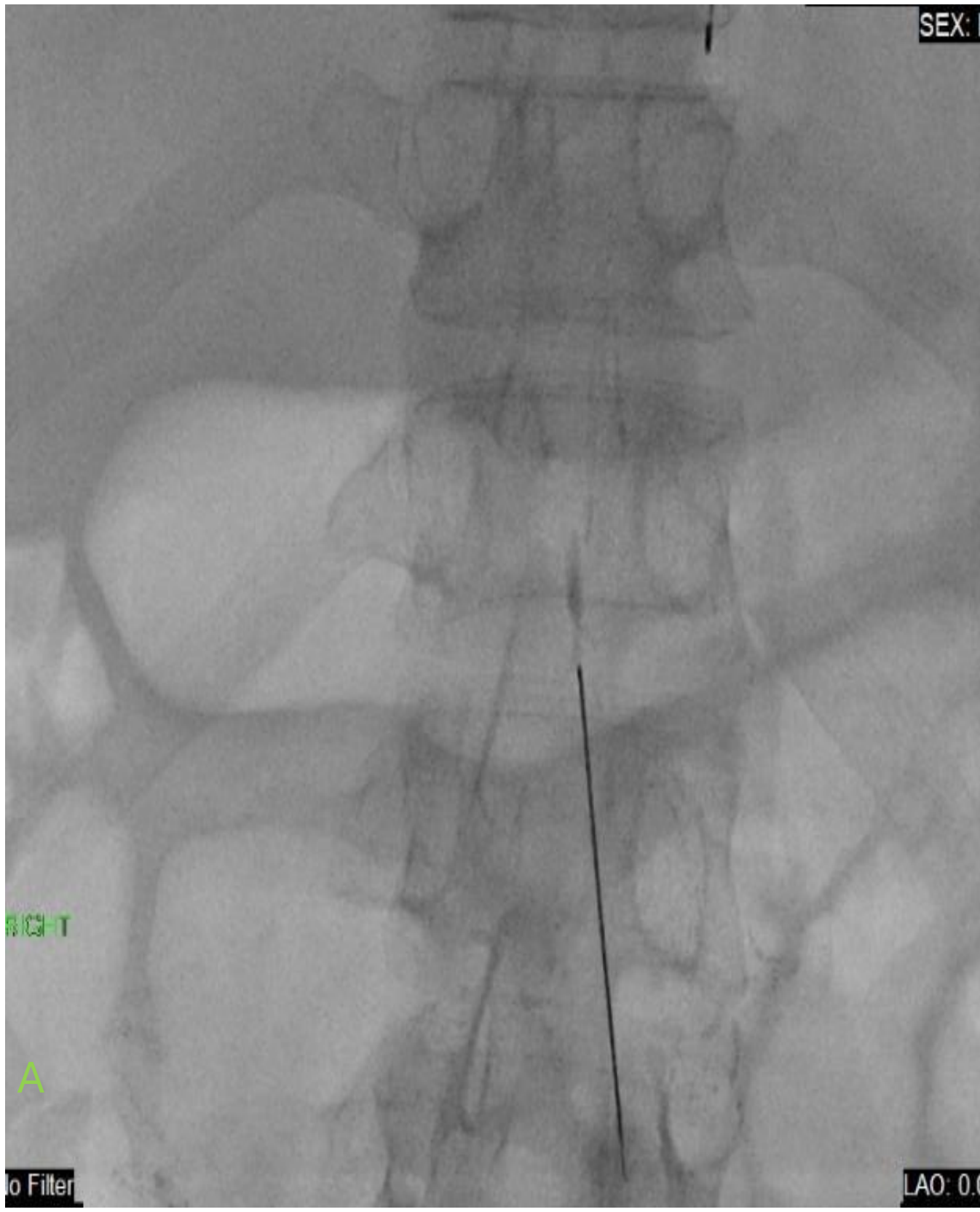


Figure 2: Fluoroscopic spot film demonstrates percutaneous access to the cisterna chyli with a 22G needle (A) and subsequent threading of an 0.018 inch guidewire into the thoracic duct (B).

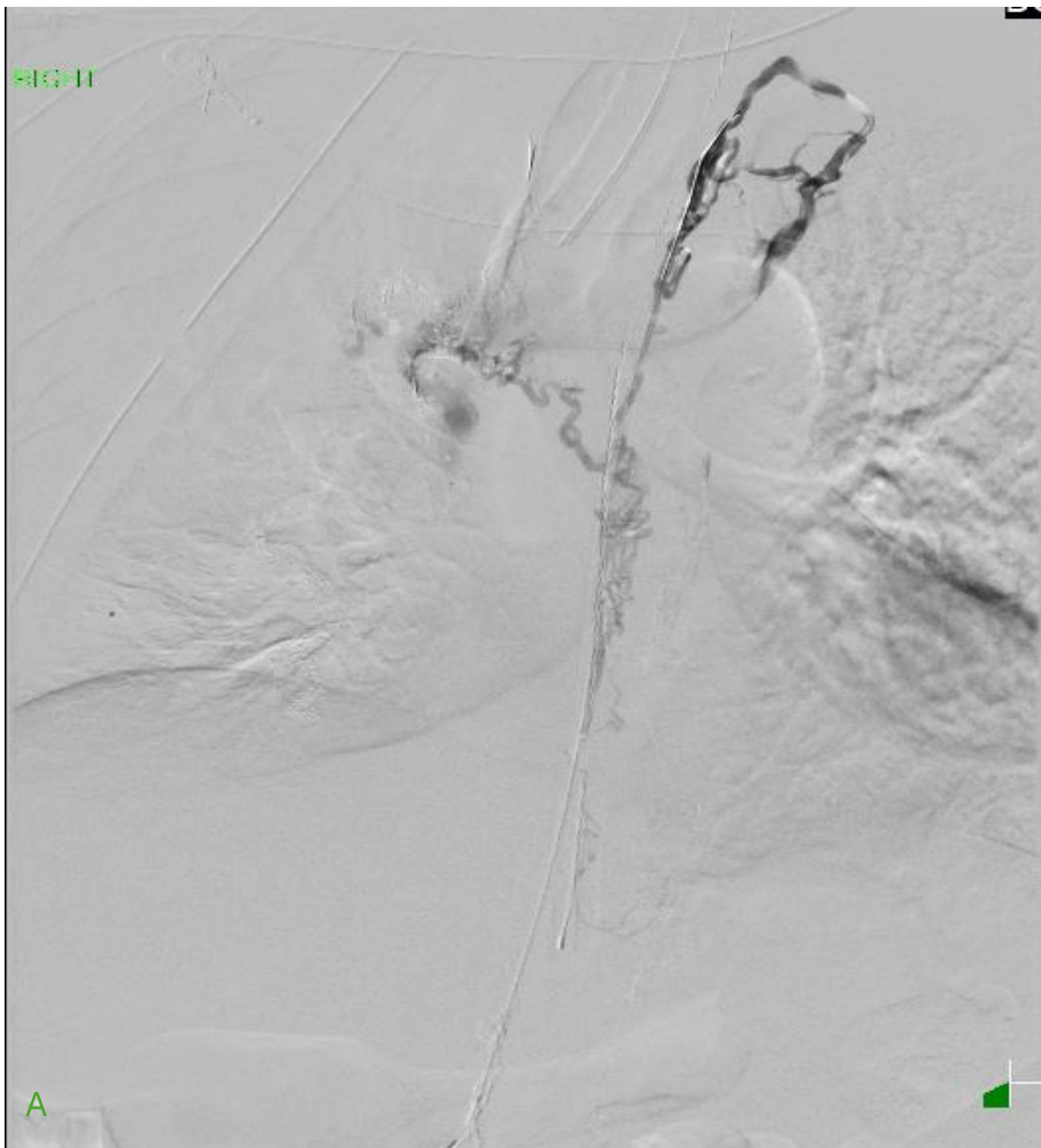
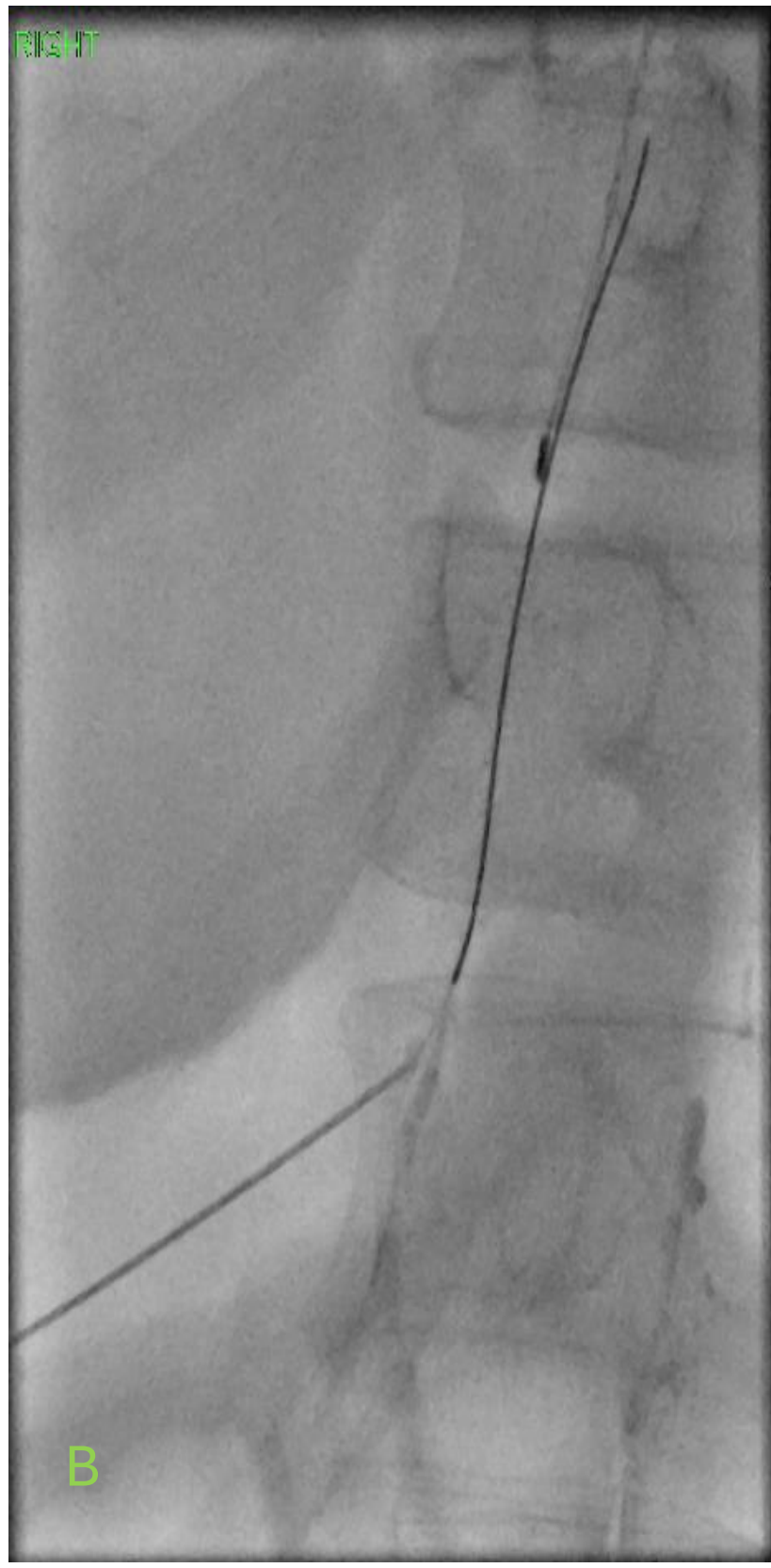
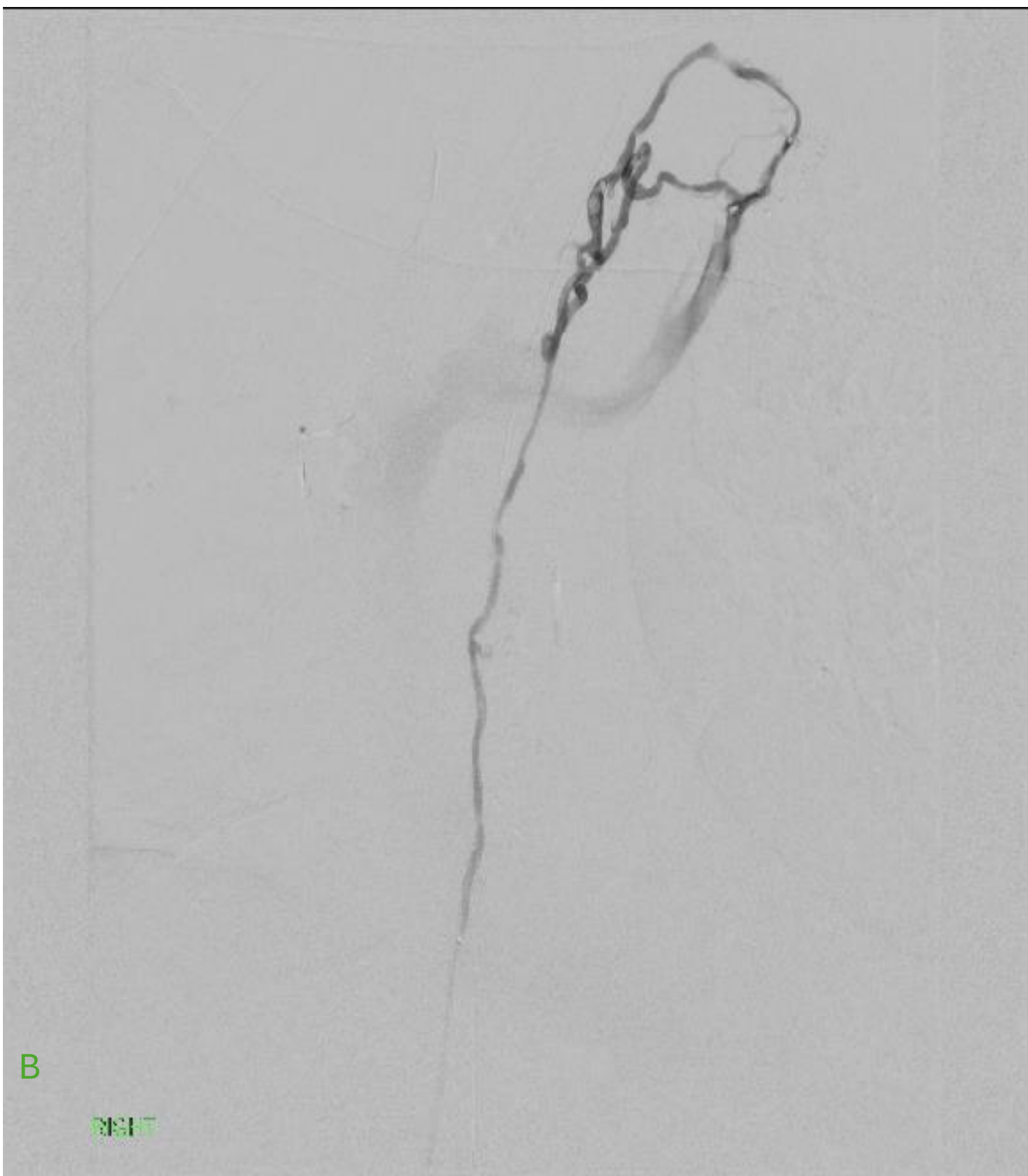


Figure 3: Thoracic duct lymphangiography through a 2.4F microcatheter demonstrates extravasation of contrast into the right hemithorax surgical bed (A). The site of injury was localized to a right side-branch of the main thoracic duct. After careful superselection of the injured branch, embolization of the focal injury was performed with 0.1 mL of 3:1 glue with an aliquot technique to preserve future use of the microcatheter. Post-embolization lymphangiography demonstrated no further extravasation, a patent main thoracic duct, and normal filling into the systemic venous system (B).



Discussion

- Conservative measures (low-fat diet, octreotide) fail in up to 50% of non-malignant chylothoraces [2–4].
- Surgery (e.g., thoracic duct ligation) is more definitive but carries high risk: up to 38% complication and 25% mortality rates [1].
- Percutaneous thoracic duct embolization (TDE) is less invasive but can cause long-term complications (e.g., chylous ascites, protein-losing enteropathy) due to total ductal occlusion [5].
- Selective lymphatic duct embolization (SLDE) preserves main thoracic duct integrity, reducing risk of metabolic complications while maintaining high efficacy (85% symptom resolution vs. 72% with TDE) [6].
- In this case, SLDE successfully treated a high-output postoperative chylothorax by targeting the leaking side-branch, avoiding the risks associated with full duct embolization.

Conclusion

- Selective lymphatic duct embolization (SLDE) provides a targeted, effective, and safer alternative to TDE in managing chylothorax from side-branch injuries.

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