

Intranodal Lymphangiography and Direct Percutaneous N-Butyl Cyanoacrylate (nBCA) Glue Embolization for Abdominal Lymphatic Leakage and Chylous Ascites

Aaron Chafitz, MD, Stephen Andrews, BS, Mina Makary, MD
The Ohio State University, Wexner Medical Center, Columbus, OH, 43210

Purpose

- Gain insight into the anatomy and physiology of the abdominal and thoracic lymphatic systems.
- Explore the causes of abdominal and thoracic lymphatic leaks.
- Review a comprehensive treatment algorithm for managing lymphatic leaks, including medical, interventional, and surgical approaches¹.
- Present a detailed case highlighting the procedural aspects of intranodal lymphangiography and direct percutaneous glue embolization for a post-surgical abdominal lymphatic leakage.

Materials and Methods

- Chyle leaks, frequently arising post-thoracoabdominal surgery, can also occur due to non-traumatic obstructions, commonly associated with malignancies.
- Clinically, these leaks may manifest as chylous ascites or chylothorax, depending on their location. Initial conservative management includes symptomatic relief, dietary adjustments, total parenteral nutrition (TPN), and octreotide.
- When these measures are ineffective, interventional techniques such as intranodal lymphangiography and lymphatic duct embolization become crucial while surgical ligation remains a viable alternative for thoracic leaks.
- For abdominal leaks, additional creative embolization approaches are employed such as direct glue embolization or sclerosis due to the lack of well-defined ductal target.

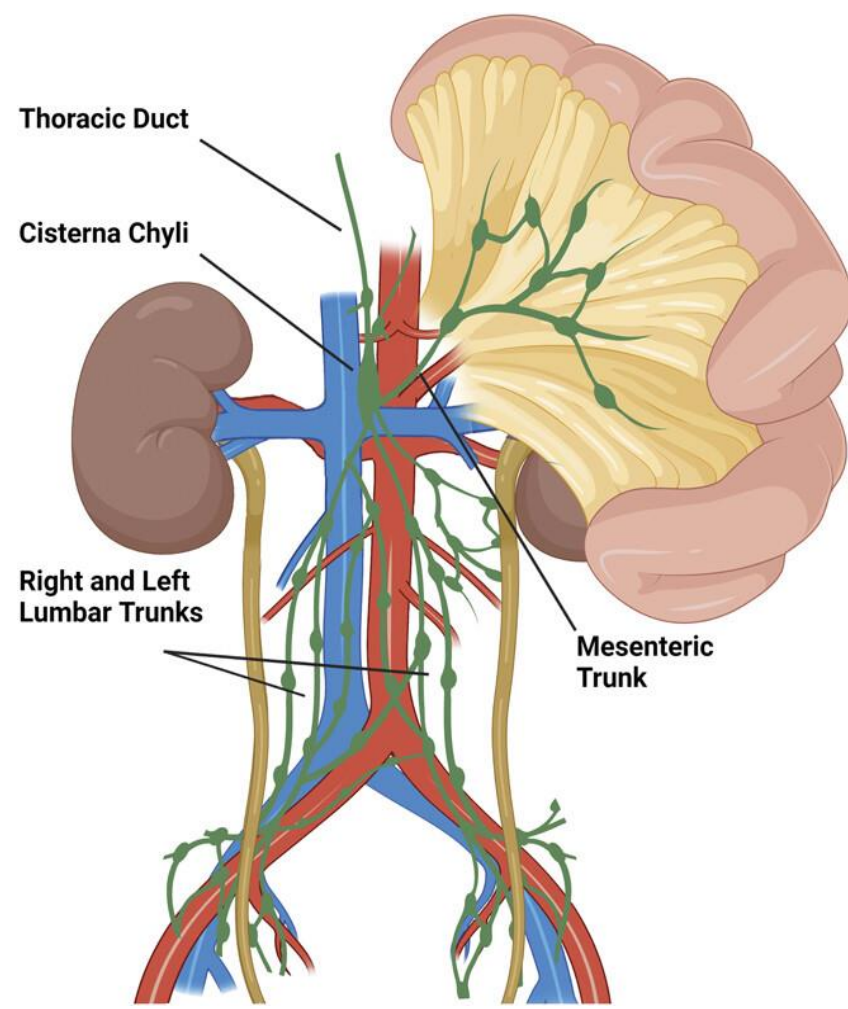


Figure 1. Anatomical diagram of retroperitoneal lymphatic distribution and associated structures².

Results

- We present a 58-year-old female patient with a left adrenal mass and retroperitoneal lymphadenopathy, scheduled for left adrenalectomy, nephrectomy, and left para-aortic lymph node dissection.
- Post-surgery, a Jackson Pratt (JP) drain was placed, which yielded a significant volume of chylous fluid. Initial conservative treatment proved ineffective.

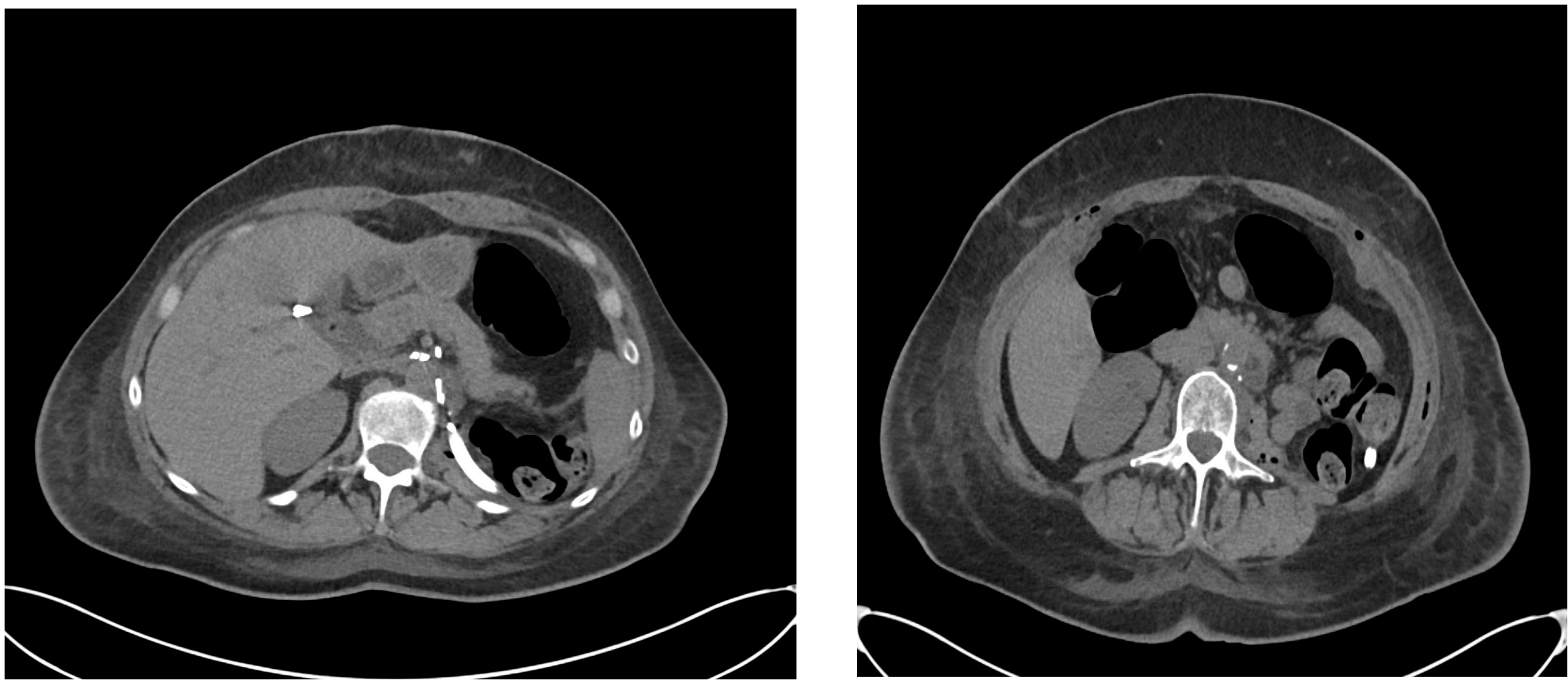


Figure 2. Post-surgical radiographs, showing left adrenalectomy and nephrectomy, at the level of the hepatic hilum (A) and lower abdomen (B).

- On post-operative day 8, diagnostic intranodal lymphangiography was performed, revealing the site of the leak in the left retroperitoneum.

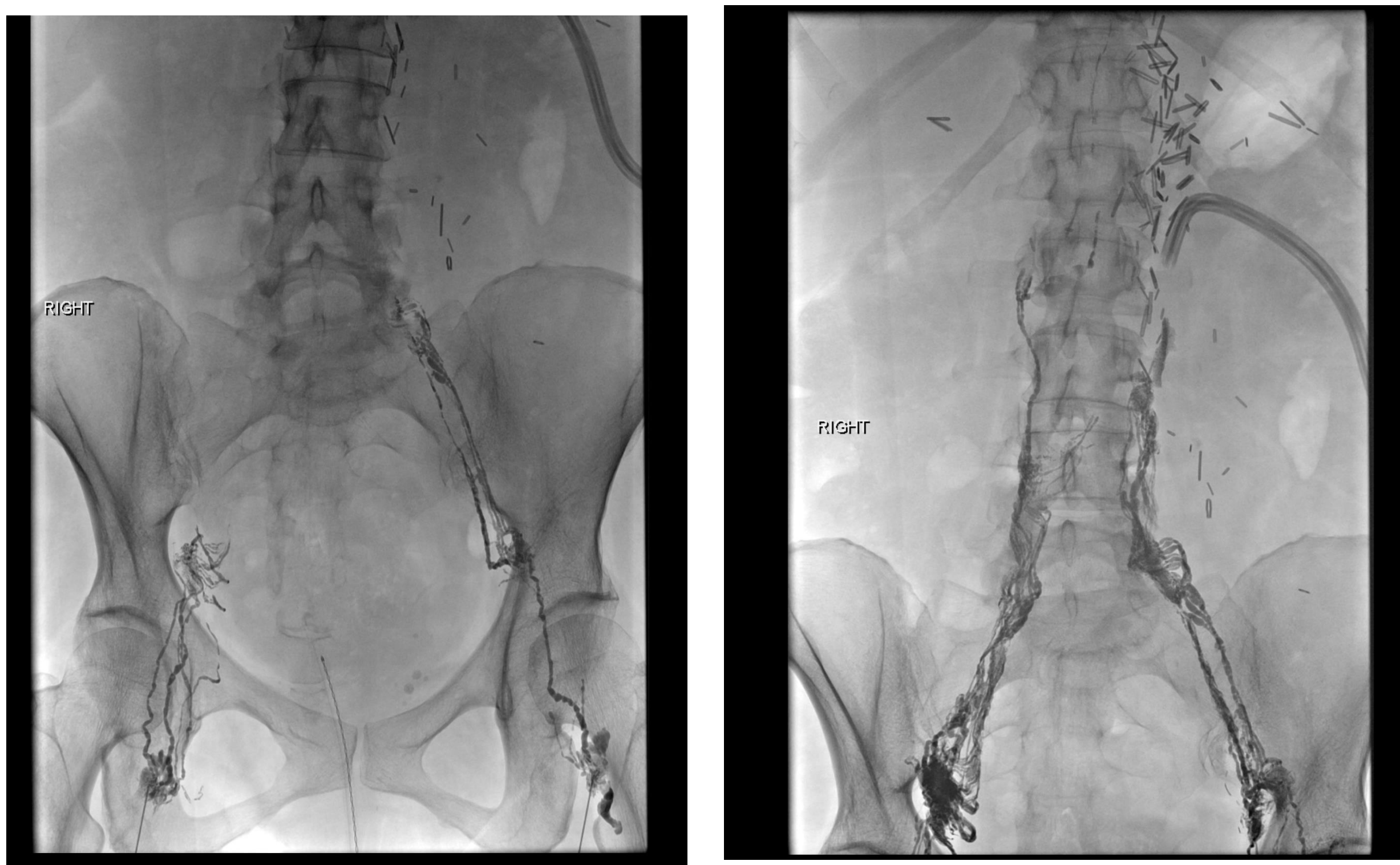


Figure 3. Lymphangiography of lower abdominal lymphatic distribution, including inguinal, pelvic chain (A), retroperitoneal and para-aortic lymph nodes (B).



Figure 4. Fluoroscopy showing para-aortic lymphatic leakage (red arrow), surgical clips and drain (A and B).

- Targeting the involved lymph node under fluoroscopic guidance, we conducted a direct percutaneous nBCA glue embolization.

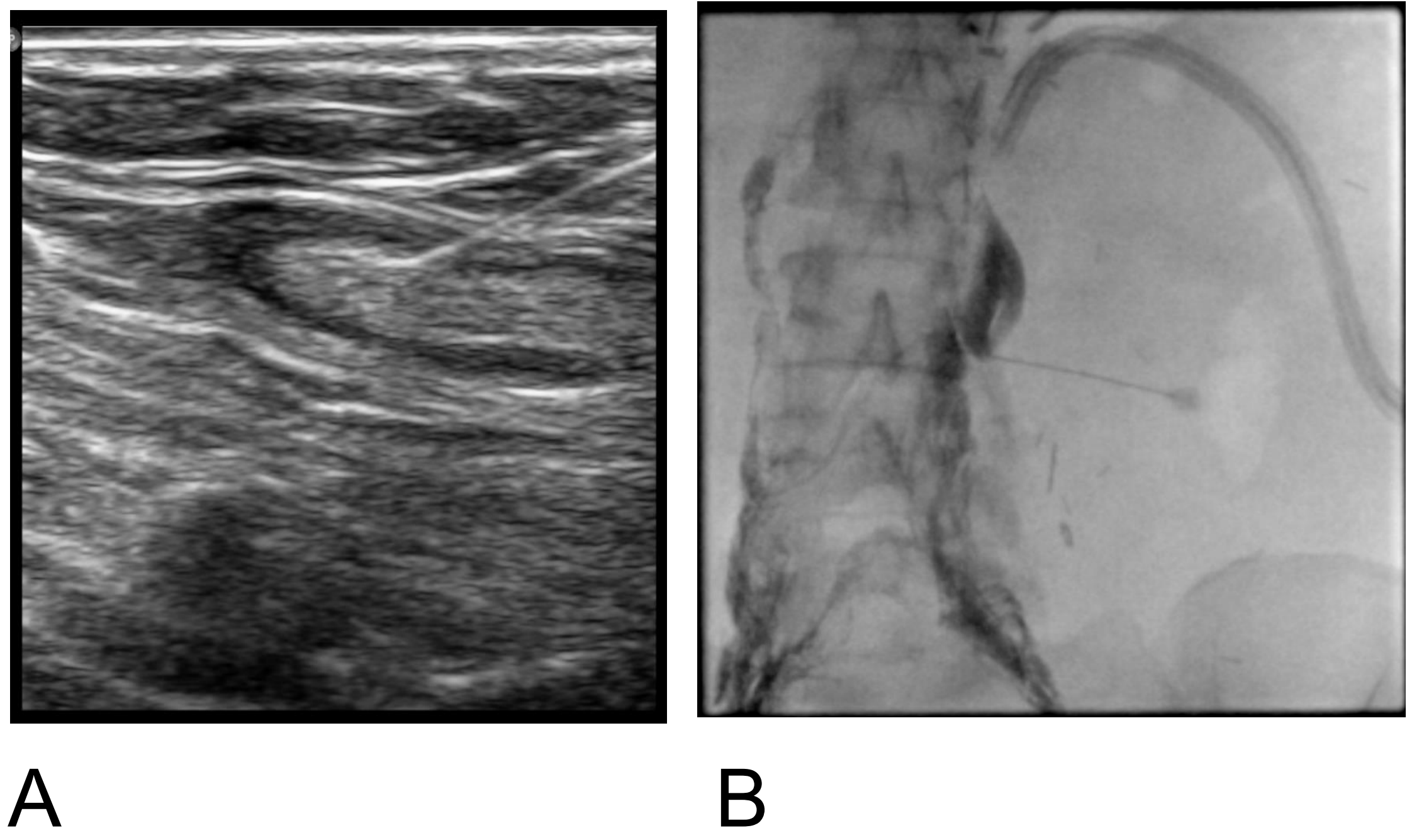


Figure 5. A. US guided percutaneous access of inguinal lymph node. B. Fluoroscopy confirmation of needle placement and n-BCA glue embolization of target lymph node.

- Post-procedure, chylous output significantly decreased, leading to the removal of the JP drain on day 1 post-procedure.

- Follow-up imaging indicated a small para-aortic low-attenuation collection containing lipiodol, which gradually diminished over time.

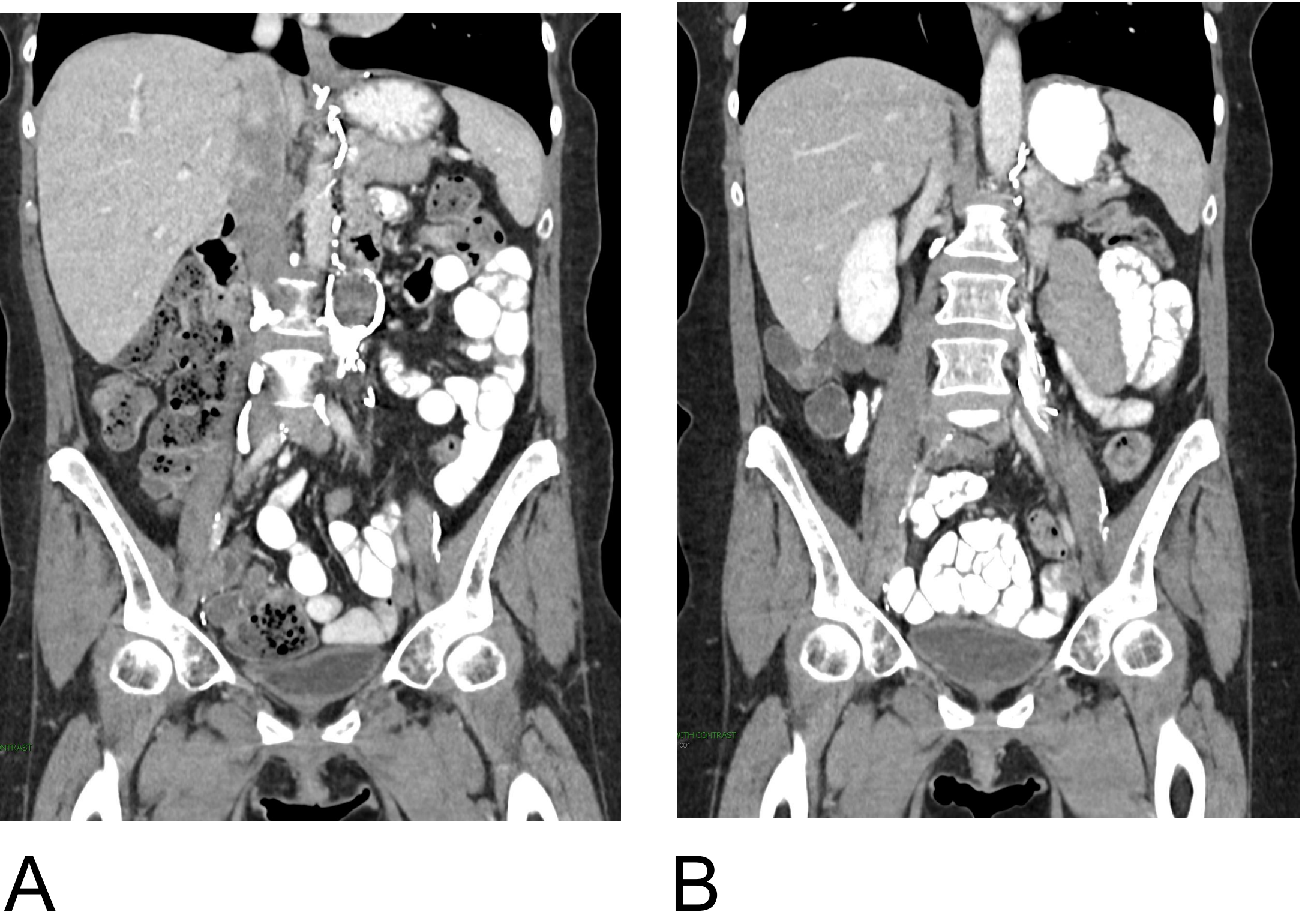


Figure 6. A. CT image of para-aortic low-attenuation collection of lipiodol post-embolization. B. CT image with resolved collection.

Conclusions

This presentation aims to enhance attendees' understanding of the following:

- **Lymphatic anatomy and physiology, the various etiologies of lymphatic leaks.**
- **A multifaceted treatment approach encompassing medical, interventional, and surgical strategies.**
- **Critical procedural techniques and outcomes in the management of abdominal lymphatic leaks.**

References

1. Majdalany BS, Khayat M, Downing T, et al. Lymphatic interventions for isolated, iatrogenic chylous ascites: A multi-institution experience. *European Journal of Radiology*. 2018;109:41-47. doi:10.1016/j.ejrad.2018.10.019
2. Rose KM, Huelster HL, Roberts EC, Manley BJ, Gilbert SM, Sexton WJ. Contemporary Management of Chylous Ascites after Retroperitoneal Surgery: Development of an Evidence-Based Treatment Algorithm. *The Journal of Urology*. Published online July 2022. doi:10.1097/JU.0000000000002494