Case Report

Successful percutaneous embolization of refractory chylous ascites following peritoneal lymph node dissection

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\textbf{ABSTRACT}

Chylous leaks are an uncommon complication in patients undergoing surgical procedures with the majority of cases responding to conservative therapies. Described is a case of a 23-year-old male who developed debilitating refractory chylous ascites as a complication after retroperitoneal lymph node dissection for testicular cancer. Prior to being evaluated by interventional radiology, he required weekly large-volume paracentesis in addition to standard conservative therapies. The patient underwent a single percutaneous treatment of a localized chylous leak involving a retroperitoneal lymphatic duct by utilizing a combined fenestration and embolization technique. Complete resolution of the patient’s condition occurred within 3 weeks. No immediate or delayed complications were observed during the 6-month follow-up period.

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\textbf{Introduction}

A chylous leak is the drainage of intestinal lymph from the thoracic duct, its tributaries, or the intestinal lymph ducts. It is often secondary to a traumatic surgery such as a lymph node dissection. Conservative therapy includes dietary modifications, somatostatin therapy, or recurrent paracentesis \cite{1}. Because of its favorable patient outcomes, thoracic duct embolization has become an alternative treatment option.

\textbf{Case report}

A 23-year-old highly active patient with a history of testicular nonseminomatous germ cell tumor confined to the testis with no lymph node or distant site spread (Stage IA) presented to our institution 6 months after undergoing a retroperitoneal lymph node dissection that was complicated by recurrent large volume chylous ascites. The patient had undergone weekly large-volume paracentesis (6-10 L) for approximately...
6 months prior to being evaluated in our interventional radiology department for potential therapy. Initial workup of the patient included a 0.9mCi filtered Tc-99m sulfur colloid lymphangiogram which confirmed the presence of an intra-abdominal lymphatic leak, without identifying a specific location of the leak. The patient was subsequently evaluated by interventional radiology with a plan to perform a diagnostic lymphangiogram with intention to treat.

Using the technique first described by Nadolski et al, bilateral inguinal lymph nodes were identified and accessed with 25-gauge spinal needles using ultrasound guidance [2]. After confirming needle position near the lymphatic hila, Lipiodol (Guerbet LLC, France) was injected slowly at a rate of 1 mL every 5 minutes for a total volume of 14 mL (7 mL’s per inguinal lymph node). Serial spot fluoroscopic images were then obtained to confirm opacification of the lymphatic channels in the retroperitoneum (Fig. 1). Active extravasation from a small lymphatic channel overlying the right psoas muscle was identified after approximately 1.5 hours of observation (Fig. 2).

Utilizing fluoroscopic and cone-beam CT guidance (Siemens Artis Zee, Erlangen, Germany), a 22-gauge Franseen needle (Cook Medical, Bloomington, IN) was advanced into the opacified lymphatic channel just inferior to the level of active extravasation from an anterior abdominal approach.
The needle was then used to fenestrate the lymphatic duct under direct fluoroscopic visualization, employing the technique described by Cope et al [3]. A second 22-gauge Chiba needle (Cook Medical) was then advanced using the same approach into this same region of the lymphatic duct. After confirming needle tip position using cone-beam CT, a 2 mL 1:1 mixture of n-butyl cyanoacrylate (Cordis Neurovascular, Inc., Miami Lakes, FL) and Lipiodol was injected into the duct and over the surface of the subjacent psoas muscle. Follow-up imaging confirmed localization of the embolic agent within the duct and retroperitoneum (Figs. 3 and 4).

Over the 3 weeks immediately following the procedure, the patient required only 2 subsequent paracenteses. The first was performed approximately 1 week after the intervention, with 4 L of chylous ascites removed. Two weeks later, an additional paracentesis yielded only 1 L of chylous ascites. No further paracenteses were required during the following 6-month follow-up period. The patient experienced no immediate or delayed complications from the procedure, and subsequently resumed his highly physical lifestyle, which was previously limited by the chylous ascites.

Discussion

Chylous ascites is an uncommon condition that can be seen as a complication of retroperitoneal surgery or traumatic injury. The clinical presentation may include abdominal pain, nausea, dehydration, nutritional deficiencies, weight loss, lower extremity edema, dyspnea, and potentially immunosuppression [3]. Chylous ascites can be diagnosed by its milky appearance, elevated triglycerides (>110 mg) and by the presence of chylomicrons [3]. Treatment of chylous leaks usually involves conservative measures such as dietary modification, bowel rest, octreotide therapy, and recurrent paracentesis. Larger lymphatic vessels, such as the thoracic duct, may undergo surgical ligation or percutaneous embolization where coils and glue may be deployed [4]. In a single study performed by Cope et al, percutaneous needle disruption and embolization of the thoracic duct yielded 72.6% complete response of unremitting chylothorax, with 27.4% partial response rates [3]. Despite these positive statistics, there are limited case reports of embolization of smaller lymphatic channels within the abdomen using percutaneous fenestration technique. To our knowledge, the use of both percutaneous fenestration and glue injection is not previously described for these small vessels (1-2 mm diameter) and should be considered for future use. We believe that this minimally invasive nonsurgical technique can provide potential long-term solutions to such refractory cases of chylous ascites, and significantly improve outcomes.

References

[1] Chen Eric, Itkin Maxim. Thoracic duct embolization for chylous leaks. Semin Interv Radiol 2011;28(1):63–74. http://dx.doi.org/10.1055/s-0031-1273941.

[2] Nadolski Gregory J, Itkin Maxim. Feasibility of ultrasound-guided intranodal lymphangiogram for thoracic duct embolization. J Vasc Interv Radiol 2012;23(5):613–16. http://dx.doi.org/10.1016/j.jvir.2012.01.078.

[3] Cope Constantin, Kaiser Larry R. Management of unremitting chylothorax by percutaneous embolization and blockage of retroperitoneal lymphatic vessels in 42 patients. J Vasc Interv Radiol 2002;13(11):1139–48. http://dx.doi.org/10.1016/S1051-0443(07)61956-3.

[4] Nadolski Gregory J, Itkin Maxim. Thoracic duct embolization for nontraumatic chylous effusion: experience in 34 patients. CHEST J 2013;143:158–63. http://dx.doi.org/10.1378/chest.12-0526.