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CASE REPORT

Chylous Ascites as a Contributor to Severe Malnutrition in Advanced Cirrhosis: A Case Report

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ABSTRACT

Introduction: Chylous ascites is the accumulation of chyle, a triglyceride and calorie-rich fluid, in the peritoneal cavity. It develops when the intra-abdominal lymphatics that contain chyle are damaged. It is a rare complication of liver cirrhosis that affects less than 1% of patients with this condition. Prompt identification may allow for treatment of associated caloric wasting.

Clinical Findings: A 52-year-old woman with alcohol-related cirrhosis and refractory transudative ascites presented for her second scheduled revision of a transjugular intrahepatic portosystemic shunt. She had confusion, constipation, worsening ascites, and severe malnutrition with muscle wasting (body mass index 12.6). The procedure was deferred, and the patient was admitted to the inpatient internal medicine service.

Clinical Course: The patient was initially treated with intravenous ceftriaxone for presumed spontaneous bacterial peritonitis. The peritoneal fluid was cloudy but did not show evidence of infection. Further testing of the peritoneal fluid revealed elevated triglycerides, indicating chylous ascites. The patient’s condition improved after large-volume paracentesis, lactulose, and supportive measures. However, she developed a rapid re-accumulation of ascites and, on hospital day 5, developed anorexia, somnolence, and hypotension. Tube feedings and broad-spectrum antibiotics for empiric sepsis treatment were started. Her condition continued to deteriorate, and she died on hospital day 7.

Conclusions: Chylous ascites may lead to a loss of dietary triglycerides that can exacerbate the malnutrition that is common in liver cirrhosis. If chylous ascites is identified promptly, dietary changes and nutritional interventions can be implemented. However, lymph-specific imaging is often needed for accurate and definitive surgical treatment.

Keywords: Chylous ascites, Cirrhosis, Case reports, Malnutrition, Triglycerides

1. Case presentation

A 52-year-old woman with alcohol-related cirrhosis and refractory transudative ascites requiring large-volume paracentesis every 2 weeks was admitted with encephalopathy, constipation, malnutrition, and sarcopenia. She initially presented for a second revision of a transjugular intrahepatic portosystemic shunt (TIPS), but this procedure was deferred due to acute encephalopathy on presentation. Since her previous revision 2 months prior, her body mass index declined from 15 to 12.6 kg/m².

After undergoing diagnostic and therapeutic paracentesis, empiric ceftriaxone and lactulose were started due to concerns about spontaneous bacterial peritonitis and hepatic encephalopathy. The paracentesis removed 5 L of cloudy peritoneal fluid (Fig. 1) that contained 87/mm³ leukocytes and negative

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Fig. 1. Cloudy peritoneal fluid removed on the day of admission. Five liters of removed fluid had a triglyceride concentration of 217 mg/dL, consistent with chylous ascites.

bacterial cultures, ruling out spontaneous bacterial peritonitis. Further fluid analysis showed a triglyceride concentration of 217 mg/dL, indicating chylous ascites. Notably, her serum triglyceride concentration was low at 35 mg/dL. Her serum albumin, B12, folate, and iron were within normal limits. She had a reported caloric intake of 1200 kcal/day leading up to admission.

After an initial improvement, the patient had a rapid recurrence of ascites that required a repeat paracentesis on hospital day 4. Peritoneal fluid studies were consistent with those obtained on admission. Despite an initial improvement in hepatic encephalopathy, she was progressively somnolent and developed hypotension on hospital day 5. She was treated with tube feeds due to poor oral intake, and with antimicrobial therapy with vancomycin and piperacillin-tazobactam for empiric sepsis coverage. Her status did not improve, and the family opted for comfort-focused care. She died on hospital day 7.

2. Discussion

We present the case of a woman who was acutely ill with end-stage liver disease complicated by chylous ascites and severe malnutrition. Chylous ascites is defined by high triglycerides in the ascitic fluid and is associated with a 70% 1-year mortality in patients with liver cirrhosis. The cut-off for triglyceride concentration in diagnosing chylous ascites varies from 110 to 200 mg/dL. We postulate that the wasting of calorie-rich triglycerides (9 kcal/g) in the patient’s ascites greatly contributed to her malnutrition. It was calculated that she lost 500 kcal due to wasted triglycerides in the removed peritoneal fluid. Chylous lymphatic flow is higher after high-fat meals, and it was assumed that the patient’s caloric wasting was even higher in the weeks leading up to hospitalization, when oral intake was more consistent. Her malnutrition was likely further augmented by her poor oral intake at baseline, secondary to discomfort caused by ascites. However, results from her other nutritional studies and serum albumin were within normal limits. By promptly identifying chylous ascites, health care providers can implement appropriate nutritional interventions.

The first-line therapy for chylous ascites is a low-fat diet, which minimizes lymph flow. A patient’s diet can be supplemented with medium-chain triglyceride oil, typically 1 tablespoon (15 mL) given orally 3 times daily. Some reviews and case reports endorse the added benefits of supplementation with octreotide (a somatostatin analog) and orlistat. A low-sodium diet and diuretics can help reduce the volume of ascitic fluid in patients with cirrhosis. If this initial approach fails, then patients can be prescribed complete bowel rest and given total parenteral nutrition. Chylous ascites only affects 0.1% to 0.5% of patients with liver cirrhosis, though that rate is higher in patients who have undergone abdominal surgery. We hypothesize that the patient’s TIPS procedure with subsequent occlusion, revision, and treatment failure was involved in the pathogenesis of her chylous ascites and caused potential damage to her lymphatics. A liver duplex ultrasound performed during her admission revealed thrombosed TIPS with hepatic vasculature that appeared normal in the setting of large-volume ascites. Yet, this imaging
Diagnosis of chylous ascites
- Clinical features of ascites
- Ascitic fluid with triglycerides > 110-200 mg/dl

Treatment
Dietary measures
- Low salt
- Low fat
- Medium-chain triglycerides
- High protein

Pharmacologic agents
- Somatostatin
- Octreotide
Total parenteral nutrition

Identifying cause
Locate site of leak
- Lymphangiogram
- Lymphoscintigraphy

Leak management
- TIPS
- Percutaneous embolization
- Peritoneovenous shunt
- Further surgical intervention

Fig. 2. Suggested algorithm for diagnosing and managing chylous ascites. TIPS, transjugular intrahepatic portosystemic shunt.

Modality likely inadequately captured lymphatic damage.

Lymphatic imaging is notably challenging. Lymphoscintigraphy, a nuclear medicine scan, may accurately identify lymphatic leaks, though the availability and accessibility of this modality is limited by the specialized contrast and equipment required. Lymphangiography is the preferred imaging modality, though detection rates vary between 60% and 86%.\textsuperscript{10–12} Identifying sites of lymphatic damage may support definitive surgical management, though 1 case series reported no benefit in patients who underwent laparotomy and lymphatic duct ligation at the site of an identified chyle leak.\textsuperscript{2} Placement of a peritoneovenous shunt may transiently reduce ascitic volume by diverting fluid to the venous system, but shunt occlusion, infection, and coagulopathies are common.\textsuperscript{12} Percutaneous lymphatic embolization is a promising new procedure with reported complication rates less than 5%, but this approach is limited by the difficulty of precisely locating the site of lymphatic damage for intervention.\textsuperscript{13} Ultimately, these imaging measures were not used in this patient’s care as her condition did not sufficiently stabilize to address definitive management.

In this report, we highlight an unusual case of chylous ascites in a patient with cirrhosis. We endorse that this diagnosis must be considered in any patient with refractory ascites who presents with progressive weight loss. Early recognition of this rare condition is needed for effective symptomatic and definitive treatment. Imaging modalities and invasive intervention for leak management are challenging and associated with several complications (Fig. 2). Nutritional and pharmacologic interventions are the preferred method for reducing the volume of ascites and severe malnutrition associated with chylous ascites.

References


