

# Chylous Ascites from Transitional Cell Carcinoma of the Bladder

Wudeneh Mulugeta, MD, MPH  
Lynn M. Steinbrenner, MD  
Deborah L. Farolino, MD

## Abstract

The majority of atraumatic chylous ascites in adults is caused by malignancies. Among the different malignancies, lymphomas are by far the most common causes of chylous ascites. Other reported causes include neoplasms arising from the breast, endometrium, ovary, testis, pancreas, esophagus, stomach, colon, prostate, carcinoid, and lung. However, atraumatic chylous ascites secondary to bladder cancer is extremely rare. We report here the case of a 74-year-old male with stage IV bladder cancer who was found to have chylous ascites.

## Introduction

Chylous ascites, or chyloperitoneum, is a rare form of ascites that is caused by the leakage of lymphatic fluid in the abdominal cavity. The reported incidence ranges from 1 per 187,000 to 1 per 20,000 admissions over a 20-year period at large tertiary referral hospitals.<sup>1</sup> Although trauma as well as congenital lymphatic abnormalities can lead to chyloperitoneum, malignancies are the most common causes, with malignant lymphomas accounting for as much as 54% of chylous ascites among adults.<sup>2</sup> The prognosis in these patients is usually very poor with a one-year mortality rate of 90%.<sup>2</sup> In addition to lymphomas, several cancers and sarcomas have been reported as the underlying causes for atraumatic chyloperitoneum. However, there is very little report of atraumatic chylous ascites secondary to bladder cancer in the literature. We discuss here a case of chyloperitoneum secondary to bladder cancer with review of the relevant literature.

## Keywords

Chylous ascites, chyloperitoneum, atraumatic, transitional cell carcinoma of the bladder.

## Case

A 74-year-old male, who was undergoing initial staging workup for a newly diagnosed transitional cell carcinoma (TCC) of the bladder, presented with a one-month history of non-specific abdominal pain. Initial abdominal computer tomography (CT) scan revealed mesenteric and retroperitoneal lymphadenopathy along with small peri-hepatic and peri-splenic ascites not amenable to paracentesis. Subsequent biopsy confirmed metastasis of TCC of the bladder to the retroperitoneal lymph nodes. Further workups of his abdominal pain with esophagogastroduodenoscopy (EGD) and mesenteric angiogram were unremarkable. After adequate pain control, he was discharged home with outpatient oncology appointment. The patient returned one week later with continuation of his abdominal discomfort along with anorexia, abdominal distension, and leg swelling. He did not have fever or chills. Upon presentation, his blood pressure was 140/66, pulse rate 82, and temperature 97.4°F. On physical examination, bowel sounds were audible. The abdomen was mildly distended and diffusely tender without guarding or rebound tenderness. There was significant pitting edema of the lower extremities. Blood analysis revealed the following results: white blood cell 4.4 k/mm<sup>3</sup>; hemoglobin 11.0 g/dl; platelets 305 k/mm<sup>3</sup>; neutrophils 73%; and lymphocytes 15.5%. Repeat CT scan of the abdomen at the time showed increased ascites as well as increased mesenteric and retroperitoneal lymphadenopathy. Paracentesis was performed with removal of 1.7L milky-appearing peritoneal fluid. Fluid analysis confirmed chylous ascites with triglyceride level of 893 mg/dl. Gram stain, bacterial, and fungal cultures of the peritoneal fluid were unremarkable. Cytology of the peritoneal fluid was consistent with metastatic TCC of the bladder. The patient was started on high-protein, low-fat, and medium-chain triglycerides (MCTs) diets along with octreotide. He was also initiated on chemotherapy with Carboplatin and Gemcitabine,

eventually completing five cycles. Repeat CT scan following five cycles of chemotherapy showed some improvement of the lymphadenopathy. Subsequent paracentesis also revealed substantial reduction in triglyceride level of the peritoneal fluid from 893 mg/dl to 240 mg/dl. Repeat cytology of the peritoneal fluid was found to be negative for malignancy. Unfortunately, our patient had multiple and prolonged hospitalizations complicated by urinary tract infection and recurrent *Clostridium difficile* colitis. The patient progressively deteriorated, and he died eight months later.

## Discussion

The lymphatic system was discovered by the Italian physician Gasparo Aselli in 1622.<sup>3</sup> Although the first case of chylothorax was reported by Bartholin in 1651, it wasn't until 1694, when Morton described the first case of chylous ascites.<sup>3</sup> Chylous ascites refers to the presence of milky chyle in the peritoneal cavity. Previous studies have reported incidence of chylous ascites ranging from 1:187,000 to 1:20,000 admissions over a 20-year period at major hospitals.<sup>1</sup> However, the incidence is believed to be increasing because of more aggressive thoracic and retroperitoneal surgery along with prolonged survival of cancer patients. Some investigators have roughly categorized the causes of chylous ascites into traumatic and atraumatic.<sup>4</sup> In traumatic cases, blunt abdominal trauma or direct injuries from surgical procedures can rupture lymphatic vessels, creating lymphoperitoneal fistula and chyloperitoneum. On the other hand, atraumatic chylous ascites manifests when the lymph flow is obstructed by non-traumatic causes, such as malignancies, infections, or congenital abnormalities. The most common causes of atraumatic chylous ascites among adults are malignancies. Malignancies can cause lymph flow obstruction by extrinsic compression or direct invasion. The majority (as much as 54%) of the malignancies causing chylous ascites are lymphomas.<sup>1,2</sup> Carcinomas of the breast, endometrium, ovary, testis, pancreas, esophagus, stomach, colon, prostate, carcinoid, and lung have also been reported as causes of chyloperitoneum.<sup>1,2,4</sup> However, atraumatic chylous ascites secondary to bladder cancer is extremely uncommon. In our Medline search (using PubMed) of the literature, we found very few reports of chylous ascites associated with bladder cancer. This is consistent with other large case series and meta-analysis studies, which did not find atraumatic chylous ascites caused by bladder cancer.<sup>2,4,5</sup> A possible explanation for this observation is the fact that the vast majority of patients with bladder cancer tend to present at early stages of the disease. According to data released by the National Cancer Institute (NCI) in 2012, nearly 86% of bladder cancers are either in situ or localized to the primary site at the time of their diagnosis.<sup>6</sup> Unfortunately, our patient had advanced bladder cancer with metastasis to the mesenteric and retroperitoneal lymph nodes leading to chyloperitoneum. Patients with chylous ascites can present with abdominal distension, non-specific abdominal pain, anorexia, weakness, and edema. To make a definitive diagnosis of chylous ascites, paracentesis should be performed for peritoneal fluid analysis. Some of the main characteristics of chyle include milky appearance, alkaline chemical

property, specific gravity greater than 1.012, and staining of fat globules with Sudan Red stain.<sup>1</sup> Although there is no set criteria to make the diagnosis of chyloperitoneum, measuring the triglyceride level is critical. The triglyceride levels are typically  $\geq 200$  mg/dl, and some authors have used 110 mg/dl as a cut off value.<sup>1,7</sup> Management of chylous ascites includes high-protein and low-fat diets with MCTs to improve nutritional status and reduce chyle formation. Although no treatment guidelines exist, several case reports have demonstrated benefits from using octreotide.<sup>8</sup> Ultimately, the treatment as well as the prognosis of chylous ascites depends on the underlying disease process. For patients with chylous ascites caused by malignancies, the prognosis is usually very poor with the three-month and one-year mortality of 52% and 90%, respectively.<sup>2</sup> Unfortunately, our patient had advanced bladder cancer with multiple complications and partial response to treatment.

*Wudeneh Mulugeta, MD, MPH, is a second year Internal Medicine/Social and Preventive Medicine Resident at the State University of New York (SUNY) at Buffalo.*

*Lynn M. Steinbrenner, MD, is Clinical Associate Professor of Hematology/Oncology, Department of Medicine at the State University of New York (SUNY), Buffalo, and Chief of Hematology and Oncology at the Veterans Administration (VA) Western New York Healthcare System at Buffalo.*

*Deborah L. Farolino, MD, is Clinical Assistant Professor of Hematology/Oncology, Department of Medicine at the State University of New York (SUNY) at Buffalo.*

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