Flood syndrome

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Flood syndrome is a rare complication of long-standing ascites and end-stage liver disease. The syndrome is named for the sudden rush of ascitic fluid that accompanies spontaneous rupture of an umbilical hernia. We present a case of flood syndrome in a 70-year-old man with cryptogenic cirrhosis and a large ulcerated umbilical hernia. Ulceration or necrosis over an umbilical hernia is a dangerous sign, signaling impending rupture, and should prompt urgent surgical referral.

CASE REPORT

A 70-year-old man with cryptogenic cirrhosis complicated by esophageal varices, portal hypertension, splenomegaly, massive ascites, and a large umbilical hernia presented with sudden and spontaneous rupture of his hernia leading to copious drainage of ascitic fluid from the abdomen. This rupture was accompanied by tenderness, erythema, and peau d'orange of the surrounding abdominal skin, which had been present for 3 weeks before presentation (Fig 1). He was hemodynamically stable and afebrile with a white blood cell count of 10,400/μL (reference range, 3,500/μL-9,100/μL) with 82% segmented neutrophils and 1% bands. Chemistry was significant for sodium level of 128 mmol/L (reference range, 136-146 mmol/L), total protein level of 4.3 g/dL (reference range, 6.7-8.6 g/dL), total bilirubin level of 3.6 mg/dL (reference range, 0.3-1.3 mg/dL), and albumin level of 2.4 g/dL (reference range, 3.5-5.5 g/dL). Liver function test results were initially normal; however, his aspartate and alanine transaminase levels and alkaline phosphatase levels later increased during his hospital course, coinciding with the development of cholecystitis. A diagnosis of umbilical hernia rupture with spontaneous paracentesis (flood syndrome) was made, complicated by cellulitis of the abdominal wall. His cellulitis was treated with vancomycin and piperacillin-tazobactam. He underwent transjugular intrahepatic portosystemic shunt procedure with improvement in his ascites. Abdominal hernia repair was ultimately postponed indefinitely given his tenuous state and poor surgical candidacy. His hospital course was complicated by septic shock requiring vasopressors secondary to cholecystitis and acute kidney injury. Ultimately, he made a remarkable recovery after percutaneous cholecystostomy tube placement and antibiotic treatment and was discharged to a rehabilitation facility. The patient's medical history was significant for non-Hodgkin's lymphoma treated with chemotherapy and prostate cancer treated with radiation therapy, both in remission. His case was reviewed by the transplant selection committee, which ultimately decided against transplantation given his history of 2 previous malignancies, age, and frailty.

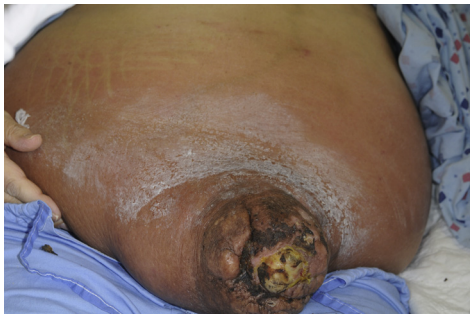

Fig 1. Large umbilical hernia with overlying central irregular clean ulcer. Surrounding erythema and peau d' orange on the lower two-thirds of the abdomen.

DISCUSSION

Flood syndrome, named for the rush of fluid or flood that accompanies spontaneous rupture of an umbilical hernia, is a rare complication of long-standing ascites and end-stage liver disease. Patients

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with cirrhosis complicated by ascites have a 20% risk of umbilical hernia development during the course of their disease.[1] The umbilicus represents a weak portion of the abdominal wall as it interrupts the linea alba. The peritoneum and overlying skin at the site of an umbilical hernia can break down completely, leading to expulsion of intra-abdominal contents. Rupture of an umbilical hernia usually occurs with drainage of ascitic fluid, which is given the term *spontaneous paracentesis*. Rupture may follow a sudden increase in intra-abdominal pressure with coughing, vomiting, straining, or rising from a seated position.[2] Rarely, evisceration of the small intestine can occur.[3] In most cases (80%), development of cutaneous ulcerations precedes umbilical hernia rupture.[3] Complications of umbilical hernia rupture include incarceration of bowel, hypotension secondary to large-volume spontaneous paracentesis, and the development of cellulitis, peritonitis, and sepsis. Ulceration or necrosis over an umbilical hernia should be considered a dangerous sign, signaling impending rupture, and should prompt urgent surgical referral.

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