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CASE REPORT

Clostridium septicum Myonecrosis Secondary to an Occult Small Bowel Adenocarcinoma

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Introduction

Small bowel malignancies are rare accounting for only 1–5% of gastrointestinal malignancies. Small bowel adenocarcinoma is the second most common small bowel malignancy. They are difficult to diagnose secondary to vague symptoms including abdominal pain, weight loss, melena, and anemia, and the majority are diagnosed with advanced stage disease [1–4].

Clostridial myonecrosis/gas gangrene is a subtype of necrotizing soft tissues infections. Spontaneous/atraumatic clostridial myonecrosis is most commonly caused by *Clostridium septicum* [5]. Although 77% of reported clostridial septicum myonecroses are secondary to gastrointestinal malignancy, only one prior case report was found associating it with small bowel adenocarcinoma [5–7]. That case was reported in 1985 in a 29-year-old male with cystic fibrosis who presented with myonecrosis of the left chest, which eventually spread throughout the chest and to the abdominal wall. He died within 24 hours of his first symptoms. He received antibiotics, but he was not debrided. A well-differentiated small bowel adenocarcinoma was found 1 cm proximal to the ileocecal valve on autopsy [7]. There are some reports that cystic fibrosis increases the risk of small bowel adenocarcinoma while our patient did not have any known risk factors for small bowel adenocarcinoma [8, 9]. We report the second case of clostridial septicum myonecrosis secondary to small bowel adenocarcinoma and the first to survive for more than 24 hours.

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Case Presentation

The case is a 76-year-old Albanian female with a past medical history significant for stroke, dyslipidemia, hypertension, and type II diabetes. In the past 2 years, she had been worked up for intermittent bloody diarrhea, abdominal pain, anemia to 9 g/dL, and unintentional 5 kg weight loss with an esophagogastroduodenoscopy and colonoscopy, which were negative for pathology. She had a prior appendectomy and no personal history of Crohn's disease, ulcerative colitis, or celiac disease. She denied any family history of cancers.

She presented to an emergency department with complaints of severe left hip and leg pain, abdominal pain, and a fever. Vitals were significant for a temperature to 39.1 °C and tachycardia to 120. Physical exam revealed erythema of the medial aspect of her left thigh and a tender abdomen. Labs revealed a white blood count of 12,000 K/uL, hemoglobin of 9.0 g/dL, creatinine of 1.3 mg/dL, and a lactic acid of 1.9 mmol/L. Blood cultures were obtained. A CT pelvis without IV contrast was obtained and revealed extensive air in the medial aspect of the left thigh (Figs. 1 and 2) and an inflammatory mass in the right lower quadrant of the abdomen (Fig. 3).

Antibiotics were administered. She developed hypotension which resolved with 6 L of crystalloid. The patient was transported to a higher acuity hospital.

On presentation, the patient appeared distressed and toxic. She was afebrile, tachycardia to 105, and with blood pressure to 100/60. Her abdominal exam revealed guarding in bilateral lower quadrants and rebound tenderness in the right lower quadrant. Her left medial thigh exam revealed crepitus, erythema, and tenderness extending beyond erythema. Labs revealed white blood count of 3450 K/uL, hemoglobin of 10.1 g/dL, creatinine of 1.58 mg/dL, and a lactic acid of 4.7 mmol/L.

She was immediately transferred to the operating room and underwent an excisional debridement (39 × 19 cm) of the left medial thigh including the facial layer. There was no bleeding from the majority of debrided area including the skin, adipose

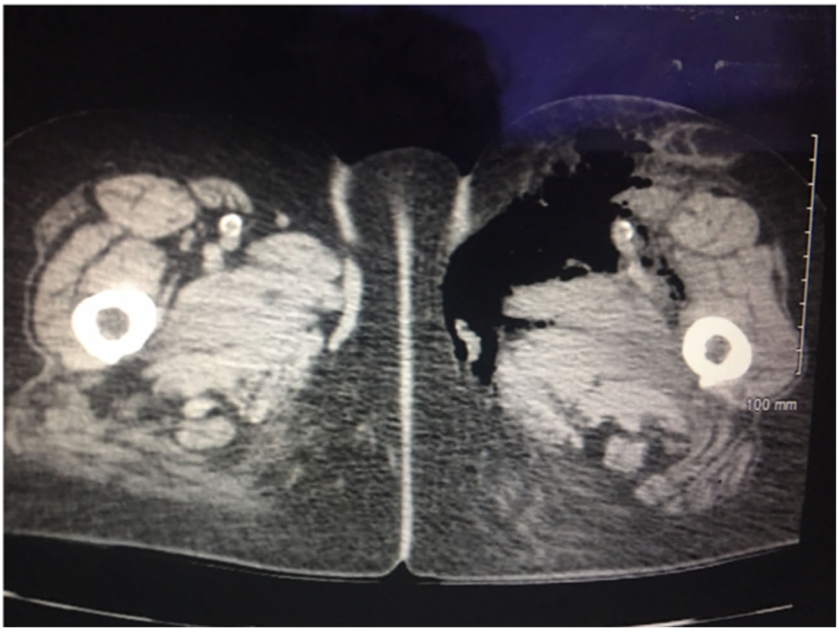

Fig. 1 Axial image of CT pelvis without IV contrast demonstrating air in the medial aspect of the left thigh

tissue, and fascia. The muscle bled some and it was left in place, but it appeared dusky. An exploratory laparotomy was also performed. The entire abdomen was inspected. There was purulent appearing fluid in the pelvis, which was sent for cultures. A large mass was noted in the ileum, 30 cm proximal to the cecum. The mass along with 5 cm of proximal and distal ileum was resected and sent to pathology (Fig. 4). She required high dose pressor support during the case; therefore, her small bowel was left in discontinuity and a temporary negative pressure abdominal dressing was left in place. She remained intubated and was resuscitated in the surgical intensive care unit. Blood cultures from the outside hospital revealed *Clostridium septicum*. She initially improved, but soon began requiring increased pressor dosing, and her left medial thigh began appearing mottled and erythematous. Within 10 hours after the initial operation, she returned to the operating room. All muscles within the left anterior and medial thigh compartments did not bleed and were non-reactive, so they were all excised. Additional skin and subcutaneous adipose tissue were excised as well. The entire excisional debridement included a 45 cm × 25 cm area. Her abdomen was re-explored. Three centimeters of small bowel appeared

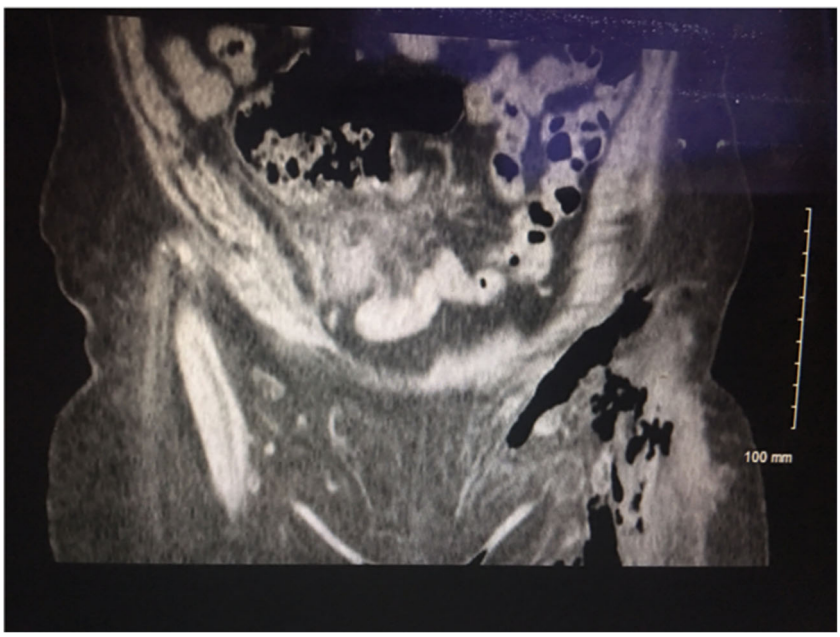

Fig. 2 Coronal image of CT pelvis without IV contrast demonstrating air in the medial aspect of the left thigh

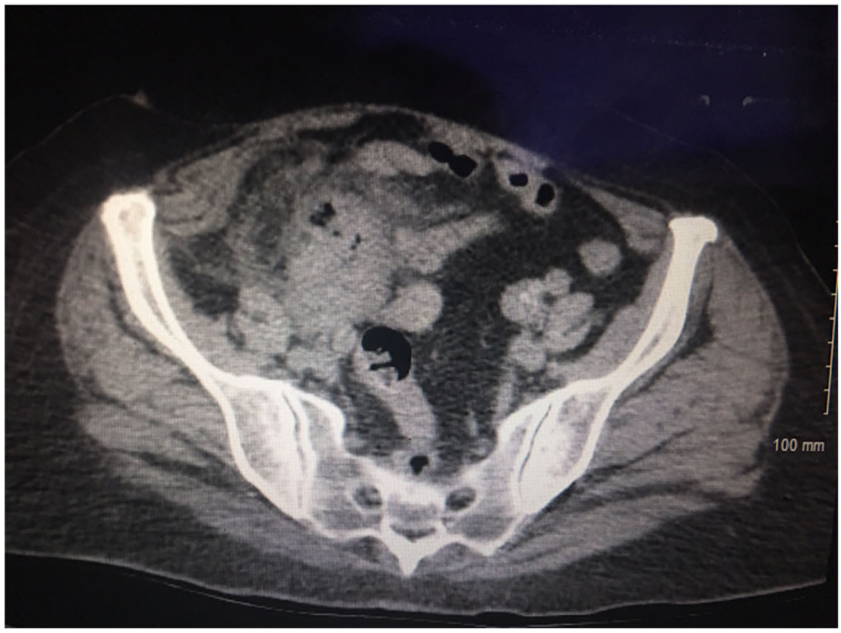

Fig. 3 Axial image of CT pelvis without IV contrast demonstrating an inflammatory mass in the right lower quadrant of the abdomen

ischemic and was resected. The patient was left in discontinuity and a temporary negative pressure abdominal dressing was placed.

She returned to the surgical intensive care unit, and she overall improved including decreased pressor requirements. A neurologic exam change was discovered. She was found to have a significant left middle cerebral artery stroke, and she was not a candidate for tissue plasminogen activator due to her recent surgeries. After extensive discussions with the family, the patient was transitioned to comfort care. The patient died 7 days after onset of symptoms.

Pathology on the small bowel mass revealed a well-differentiated 11-cm small bowel adenocarcinoma with invasion through the muscularis propria into the subserosa (Fig. 5). There was no lymph-vascular invasion or perineural invasion. All margins were negative for tumor. There was associated serositis and an abscess associated with the mass. Fifteen lymph nodes were included in the specimen, and all were negative. Her American Joint Committee on Cancer staging was pT3 pN0.

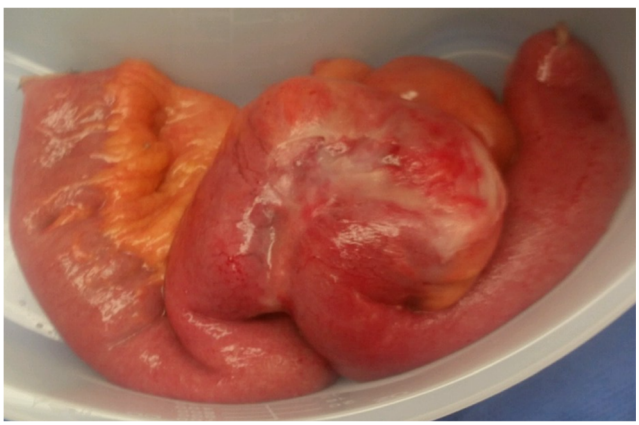

Fig. 4 Inflammatory mass in the small bowel as seen in Fig. 3

Discussion

We presented the second reported case of clostridial septicum myonecrosis secondary to small bowel adenocarcinoma and the first to survive more than 24 hours. In the literature, the majority of clostridial septicum myonecroses in the adult population occur in patients with malignancy (78%), diabetes mellitus (41%), and/or neutropenia (11%) [5]. The most common malignancy was gastrointestinal (77%) followed by hematological (11%) [5]. The remaining cases occurred in a variety of cancers including breast, larynx, non-small cell lung cancer,

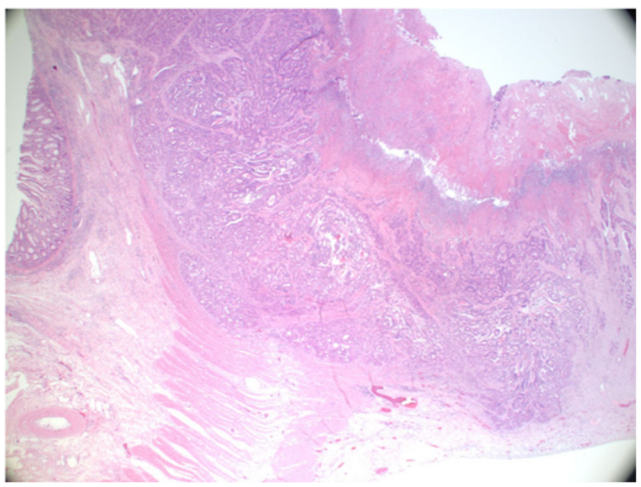

Fig. 5 Histologic appearance of small bowel adenocarcinoma invading through the muscularis propria into the subserosa

endometrial cancer, squamous carcinoma of the vulva, and prostate cancer [5]. Almost one third (32%) of the prior reported cases of clostridial septicum myonecrosis occurred in patients with gastrointestinal malignancy and diabetes mellitus, which is consistent with our patient [5].

Of those with gastrointestinal malignancy, over half (67%) died [5]. The location of the gastrointestinal malignancies in prior case reports was cecum (48%), ascending colon (19%), rectum/sigmoid (17%), transverse colon (14%), and ileum (2%) [5]. In the prior *Clostridium septicum* myonecroses from gastrointestinal malignancy, the majority were occult [5]. Unfortunately, it is hard to know if most of these cancers were advanced or not, due to the majority of patients dying secondary to the myonecrosis.

While fecal carriers of *Streptococcus bovis* and *Streptococcus bovis* infections have been shown to be more common in patients with colorectal neoplasm, no study has evaluated fecal carriage of *Clostridium septicum* in patients with colorectal cancer [10, 11]. Although, it has been shown that *Clostridium septicum* fecal carriage in the general adult population has a low prevalence [12].

Clostridium septicum infection secondary to small bowel adenocarcinoma is an exceedingly rare entity. We add this interesting index case to the literature.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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