

## CASE REPORT

# Spontaneous seromuscular laceration of the sigmoid colon: a case report

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## Introduction

Bowel injury after blunt trauma to the abdomen is a relatively rare phenomenon that can often result in significant morbidity and mortality [1]. In addition, injury to the small bowel after a traumatic event is very often overlooked and can lead to significant clinical sequela [2, 3]. Patients with bowel injury often require rapid surgical intervention and intensive care unit (ICU) level care [1]. Postoperative/posthospitalization care can be challenging for these patients depending on the extent of damage to the bowel and the degree of bowel resection necessary. Surgical complications after bowel injury include short bowel syndrome, rebleeding, wound dehiscence, adhesions, infection and potential need for more surgery [4]. Bowel injury can be separated into five major categories: (1) Serosal lacerations, (2) intramural hematomas, (3) mesenteric vessel injuries, (4) transmural perforation, and (5) transection of the bowel [5]. The literature is replete with traumatic etiologies of bowel injury but mention of bowel injury with no historical or physical evidence of blunt abdominal trauma, no previous abdominal surgery

### Key Clinical Message

Injury to bowel can result in high morbidity and death. Bowel injuries typically occur after external trauma to the abdomen. Bowel injury in the absence of external trauma is rare. Here, we report a 36-year-old male presenting with a sigmoid colon laceration likely due to long-standing constipation.

### Keywords

Blunt abdominal trauma, bowel injury, constipation, laceration, seromuscular.

and no frank gastrointestinal disease is scarce [6–11]. The aim of this report is to present an isolated case of spontaneous colonic seromuscular laceration in a young male patient with emphasis on treatment and discussion of potential etiologies of the condition. In addition, this report reveals that the clinical course of spontaneous bowel injury can be equally as complicated as bowel injury due to blunt abdominal trauma.

### Case

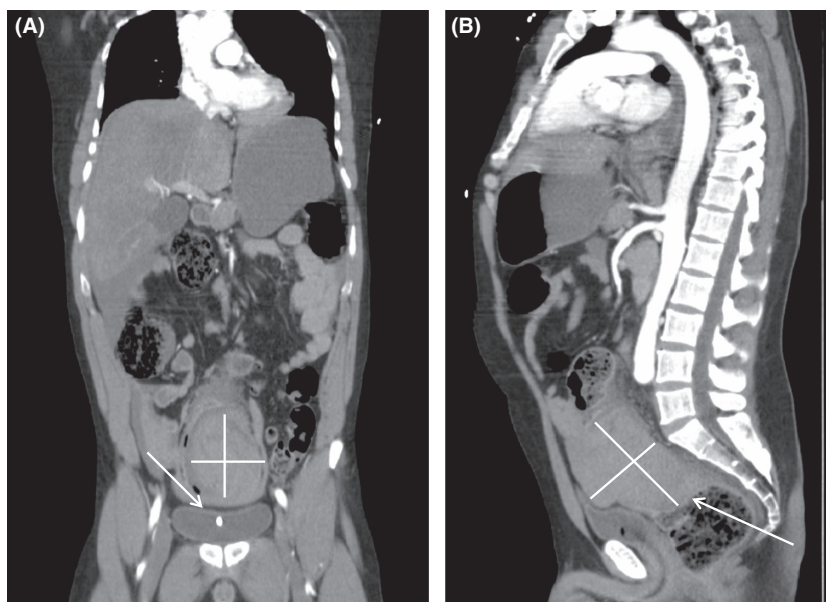
A 36-year-old Hispanic male presented to the emergency department (ED) with complaints of abdominal pain, low volume bright red blood per rectum, urinary retention, severe constipation, straining on defecation, chest pain, and nausea for 6 days. The patient had a past medical history of diabetes, hypertension, and hypercholesterolemia. The patient reported to his outpatient clinic 3 days prior with complaints of severe constipation. Docusate/Senna combination therapy at a dose of 50 mg/8.6 mg and a frequency of two capsules every 12 h was prescribed to assist with defecation. There was no

improvement. On admission the patient reported no recent fever, no chills, no weight loss, no night sweats, no hematemesis, no melena, and no trauma. Vital signs were stable on admission. Physical examination revealed a diffusely tender abdomen with significant guarding. No evidence of external trauma was noted. Abdominal distension and hypoactive bowel sounds were also documented. Laboratory analysis (Sysmex XE 5000™ – Automated Hematology System, Dimension Vista® 1500 – Siemens Healthcare Diagnostics, Tarrytown, NY, USA) revealed mild hemoconcentration (Hemoglobin-15.7 g/dL, Hematocrit-44%), a mild leukocytosis [white blood cells (WBC)- $11.1 \times 10^9/L$ ], elevated blood glucose (188 mg/dL), and a mild transaminitis (alanine aminotransferase 61 units/L, aspartate aminotransferase 27 units/L, alkaline phosphatase 104 units/L). The troponin level was normal. An indwelling catheter was placed to relieve urinary retention and a noncontrast computed tomography (CT) scan of the abdomen and pelvis with multiplanar reconstruction (Siemens CT Somatom® Emotions Duo System) was obtained revealing a large, hypodense pelvic mass (Fig. 1A and B). The radiologist was unable to determine the exact origin of the mass noting relation to the colonic wall versus an extrinsic mass compressing the sigmoid and bladder.

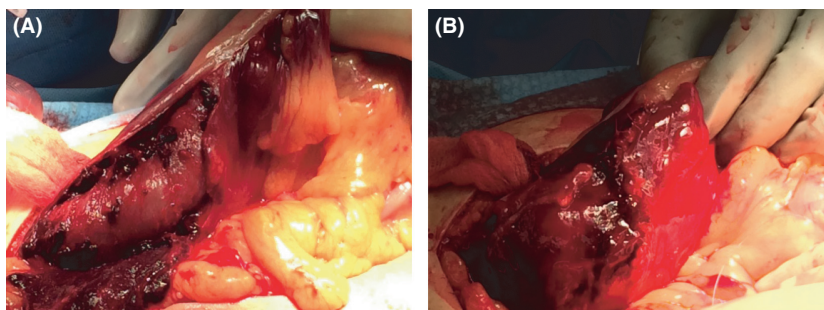
General Surgery was consulted and it was decided that the patient would need vigorous fluid resuscitation prior to surgical intervention. The patient remained in the ED.

During the patient's stay in the ED his WBC count elevated from  $11.1 \times 10^9/L$  to  $25.4 \times 10^9/L$  over a period of 7 h. The patient also had an elevated lactic acid of 2.4 millimol/L. The patient continued aggressive intravenous hydration and was made nothing by mouth for surgery later that day. Additional interventions for the patient included obtaining a blood type and screen in preparation for a potential blood transfusion, obtaining microbial blood cultures, insertion of a nasogastric tube set to low intermittent suction, and antibiotic treatment with vancomycin, ciprofloxacin, and zosyn.

After intravenous fluid resuscitation the patient was sent to the operating room for an exploratory laparotomy. A midline incision approximately 5 cm above the umbilicus down to the pubis was made. The midline fascia was then dissected revealing the peritoneum. Blood could be appreciated in the peritoneal cavity through a translucency in the peritoneum. The peritoneum was then opened and suctioned vigorously. After suctioning was performed large adherent clots were appreciated on the sigmoid colon. After removal of the clots a 10 cm laceration in the sigmoid colon that was confined to the seromuscular layer was revealed (Fig. 2A). There was no injury to the submucosal or mucosal layer of the sigmoid colon. The repair of the seromuscular laceration was done with 3-0 vicryl interrupted absorbable sutures (Fig. 2B). The abdominal incision was then closed using #1 PDS suture for the fascia and skin staples.



**Figure 1.** Pelvic mass on CT imaging described in case. (A) Coronal CT image of the pelvic mass in case 1. The height of the mass was measured at 11 cm. The width of the mass was measured at 10 cm. White bars are used to approximate dimensions. The patient's bladder is compressed inferiorly to the mass (white arrow). (B) Sagittal CT image of the pelvic mass in case 1. The depth of the mass was measured at 8 cm. White bars are used to approximate dimensions. The patient's sigmoid colon is compressed inferiorly to pelvic mass (white arrow).



**Figure 2.** Serosal laceration with repair. Intraoperative images that were taken from a case very similar to the case presented. (A) Laceration of the seromuscular layer of the sigmoid colon with adherent clots identified during ex-lap. (B) Surgical repair of the seromuscular layer of the colon with buried interrupted absorbable sutures.

The patient was transferred from the ICU to the surgical floor on postoperative day 1. The patient continued to receive intravenous fluids during his stay in the ICU. A day 2 postoperative noncontrast CT scan of the abdomen and pelvis with multiplanar reconstruction showed no bowel obstruction and normal postsurgical inflammatory changes. On postoperative day 3, frank output of coffee ground blood was noted from his nasogastric tube. Gastroenterology was consulted and upper endoscopy was performed. The upper gastrointestinal bleed was thought to be associated with traumatic placement of the nasogastric tube. No endoscopic intervention was required. The patient's leukocytosis, lactic acidosis, and urinary retention resolved over course of his ICU stay. The patient had his foley catheter removed on day 4 of his ICU stay. The patient was stepped down to the general medicine floor on postoperative day 5. The patient's microbial blood cultures remained negative. Intravenous fluids and antibiotics were discontinued. The patient was able to tolerate meals on day 6 and started to pass flatus. The patient was discharged home in stable condition on postoperative day 7.

The patient was seen in clinic for a follow up visit 2 weeks after his discharge date. He reported no complaints and was recovering appropriately. The patient said that his bowel movements were more regular and on physical exam palpation of the abdomen did not reveal any significant abdominal tenderness. His surgical staples were removed at this visit without complication. The patient was instructed that he could schedule additional follow up visits on an as needed basis and to maintain a diet that is high in fiber as an outpatient.

## Discussion

Here, we have presented a case of spontaneous seromuscular laceration of the sigmoid colon without any historical or physical evidence of trauma or frank gastrointestinal disease such as appendicitis, gastric/peptic

ulcers, inflammatory bowel disease, or diverticulitis. To our knowledge, this phenomenon has been reported only once in the literature and this patient presented with peritonitis due to a diagnosis of appendicitis [9]. Interestingly, the patient described in this report was a young male. Spontaneous colon injury would seemingly be more common in the elderly due to a higher incidence of gastric immotility and structurally weaker intestinal tissue [12]. The young age of this patient coupled with the absence of frank gastrointestinal disease and no prior history of abdominal surgery raise the question about the possible presence of risk factors predisposing him to developing this condition.

When considering the potential etiologies for the colonic injury presented in this report it is important to remember that the patient sustained an injury that was confined to the seromuscular layer of the colon. The layers of the bowel wall beginning with the layer most proximal to the lumen are the mucosa, submucosa, muscularis propria, subserosa, and the serosa. Gastrointestinal diseases such as diverticulitis, ulcers, inflammatory bowel disease, and appendicitis almost exclusively start with an insult at the level of the colonic mucosa which can lead to colonic perforation [13]. The patient did not have any historical or physical evidence of the aforementioned diseases and he also did not have any evidence of injury to the colonic mucosa. Two prominent historical gastrointestinal symptoms that the patient revealed were significant constipation and forcible straining while defecating. It is plausible that stasis of fecal matter in the colon coupled with high intensity valsalva maneuvers led to increased tension at the outer most layer (serosa) weakening it to the point where it was no longer able to support the tension therefore resulting in a tear. The question then becomes, why would this patient be more susceptible to colonic injury from constipation than any other individual with constipation?

The patient discussed in this case report had a past medical history of diabetes. Ileus is a common condition

associated with this disease [14]. Ileus is broadly defined as malfunctioning of the normal propulsive ability of the gastrointestinal tract. The patient may have been dealing with chronic ileus for a number of years, predisposing him to this injury. In addition to undiagnosed ileus, the patient could have been eating a low fiber diet which is thought to be a predisposing factor of constipation [15, 16]. The patient's dietary habits were not questioned while gathering his history but the patient was recommended to maintain a diet that is high in fiber as an outpatient. Another contributing factor to the patient's constipation could be chronic narcotic use, a known predisposing factor to constipation and the driving force behind the use of the drug relistor [17], but the patient denied any use of narcotic medications [18]. Diabetes, constipation, low fiber diets and ileus are not uncommon in the general population and if these were the only factors contributing to the colonic seromuscular laceration that was seen in this patient then it would be expected that this type of injury would be more frequent. Therefore, constipation is not likely to be the sole cause of the seromuscular laceration in the patient.

The presence of a connective tissue disorder would seem to offer another possible etiology for the seromuscular injury. Scleroderma, Mixed Connective Tissue Disease, Ehlers-Danlos Syndrome, and Marfan's Syndrome among others can theoretically weaken the extracellular matrix of the colonic wall [19]. However, in this report, the patient did not display symptoms or have a history of any connective tissue disease. Lacerations in the colonic serosa are an unusual presentation for any of the aforementioned connective tissue diseases so it was decided that clinical testing for these diseases would be inappropriate.

A distant, forgotten history of abdominal trauma cannot be excluded as a potential cause for this injury [20]. Over time minor trauma to the colon wall could evolve into a significant laceration leading to the severe clinical course that this patient experienced. Constipation could be a contributing factor in this scenario as well. As mentioned previously, extensive questioning and thorough physical exam revealed no history of trauma making this etiology less likely.

## Conclusions

Although the specific etiology of the colonic seromuscular injury in this patient remained unclear and is likely multifactorial, what is clear is that prompt and intensive care is required for any patient who presents with an acute abdomen no matter the cause. Rapid intravenous hydration and surgical intervention are critical and very often result in preservation of life [21]. Additional interventions such as nasogastric suctioning, blood transfusions and

administration of antibiotics can be implemented on a case-by-case basis. The purpose of this report was to highlight a rare but potentially devastating cause of acute abdomen. Spontaneous colonic seromuscular lacerations should be added to the differential diagnosis of any practitioner assessing a patient presenting with an acute abdomen and/or an abdominal or pelvic mass on radiographic imaging. We hope that this report will serve as the launching point for the discovery of the cause(s) of this condition so that proper preventative measures can be put in place for at risk individuals.

## Consents

A copy of the written informed consent provided by the patient prior to publication has been made available for review by the Editor-In-Chief of this journal.

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## Conflict of Interest

None of the contributing authors have any conflict of interest, including specific financial interests or relationships and affiliations relevant to the subject matter or materials discussed in this manuscript.

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