Splenic flexure volvulus presenting with gangrene

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ABSTRACT

انفتال الثنية الطحالية يعد من الأسباب النادرة لانسداد القولون حيث يشكل (2%) من حالات تعقد وانسداد القولون. الأسباب الأولية لهذه الحالة هي غياب أو ارتخاء الأربطة المتصلة بين الثنية الطحالية للقولون والمعدة أو الطحال أو الغشاء الحاجز لأسباب خلقية، أما الأسباب الثانوية فهي إجراء عمليات جراحية سابقة تؤدي إلى تحرير الأربطة المذكورة. تشخيص هذه الحالة قبل العميلة الجراحية يتم بواسطة وجود سمات خاصة في أشعة البطن العادية والأشعة المقطعية. نستعرض التقرير حالة لشاب أصيب بانفتال الثنية الطحالية للقولون حيث كان يشكو من ألم حاد مع انتفاخ في البطن. وسوف يتم عرض أهمية الأشعة العادية للبطن والأشعة المقطعية في تشخيص هذه الحالة. كشفت العملية الجراحية عن إصابة الثنية الطحالية للقولون بالغرغرينا، وتم استئصال الجزء المصاب وتوصيل الأولي للقولون في العملية ذاتها. وقد تم عرض ما يزيد عن 32 حالة مشابهة في السابق وقمنا بمراجعتها في هذا المقال فيما يخص الأسباب، الأعراض السريرية، الفحوص التشخيصية والطرق العلاجية.

Volvulus of the splenic flexure is very rare cause of colonic obstruction constituting 2% of cases of colonic segmental volvulus. Primary splenic flexure volvulus (SFV) is due to congenital absence or laxity of the phrenocolic, gastro colic, and splenocolic ligaments while secondary volvulus is due to other causes including some prior surgery releasing these ligaments. A preoperative diagnosis can be established based on the characteristic radiological findings on plain x-ray abdomen and CT scan. We present a case of SFV in a young man who presented with acute abdominal pain, and distension, and illustrate the usefulness of CT scan, and plain x-ray of the abdomen in making a preoperative diagnosis. Laparotomy revealed a gangrenous SFV, which was resected and primary anastomosis was carried out. Literature is reviewed with regards to predisposing factors, presentation, investigation, and management among the more than 32 cases reported so far.

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Large bowel volvulus accounts for 1-7% of all the large bowel obstructions in the western world.[1] However, it is more common in regions of Africa, Southern Asia, and South America.[1,2] Over 50-80% of large bowel obstruction, in the volvulus belt of Africa and the Middle East are due to volvulus almost exclusively of the sigmoid colon.[2,3] While the most common site of volvulus includes sigmoid colon (80%), cecum (15%), and transverse colon (3%), the incidence of splenic flexure volvulus (SFV) is around 2%.[1-3] It is the rarity of this condition that makes the clinical diagnosis difficult, leading to delay in the treatment and influencing its outcome. We report this case to illustrate that SFV is to be considered as one of the rare differential diagnoses in a patient presenting with acute abdomen and progressive upper abdominal distension, and demonstrate the usefulness of radiological investigations in establishing a preoperative diagnosis, and discuss the various management options based on literature review.

Case Report. A 43-year-male was admitted with 3 days history of colicky abdominal pain, progressive distension, and absolute constipation. Three months back he had a similar but milder episode, which resolved

spontaneously. He did not vomit and denied alteration of bowel habit or loss of weight. His appetite was normal. Clinical assessment revealed mild dehydration, temperature: 37.5°C; pulse: 80/min; blood pressure: 126/78 mm Hg. Abdomen was devoid of scars, grossly distended, soft and tympanic with no tenderness. Bowel sounds were feeble and rectum was empty. Serum electrolytes showed low levels of sodium (131 mmol/L, normal range 135-145), potassium (3.3 mmol/L, normal range 3.5-5.1) and chloride (93 mmol/L, normal range 98-107). His hemoglobin was 15 gm%, white blood cells 11.3 x 10^9/L with a neutrophilia of 83.2%. Plain x-ray of the abdomen showed 2 widely separated air fluid levels, one in the distended splenic flexure and other in the cecum (**Figure 1**), and markedly dilated air filled colon in the left hypochondrium, and mid abdomen (**Figure 2**). This had a coffee bean appearance with concavity facing to the left upper abdomen causing elevation of left diaphragm, and abrupt termination at the anatomic splenic flexure (**Figure 2**). Volvulus of the splenic flexure of the colon was suspected, and a computerised tomography (CT) scan of the abdomen was performed. The CT scan confirmed the diagnosis of SFV, and showed a grossly dilated splenic flexure with a characteristic whirl sign at the site of twist of the mesentery (**Figure 3**). A diagnosis

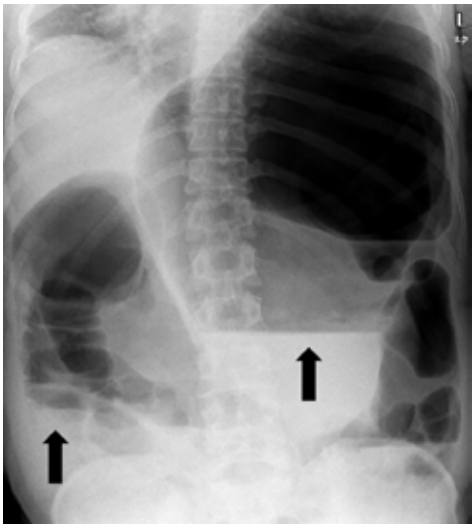

Figure 1 - Plain x-ray of abdomen showing 2 widely separated air fluid level in the cecum and distended splenic flexure (arrows).

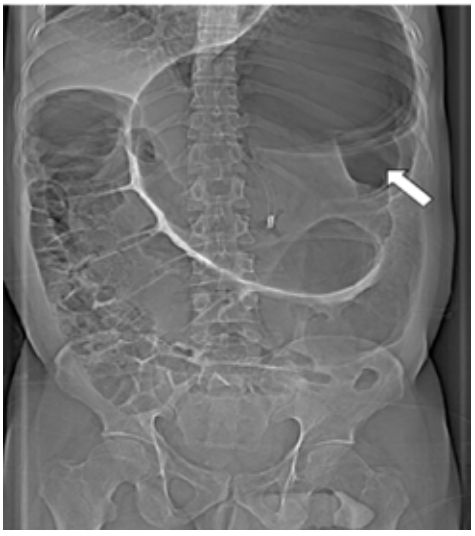

Figure 2 - CT scout film showing coffee bean shaped dilated splenic flexure with concavity of bean facing to the left upper abdomen (arrow). CT-computerised tomography.

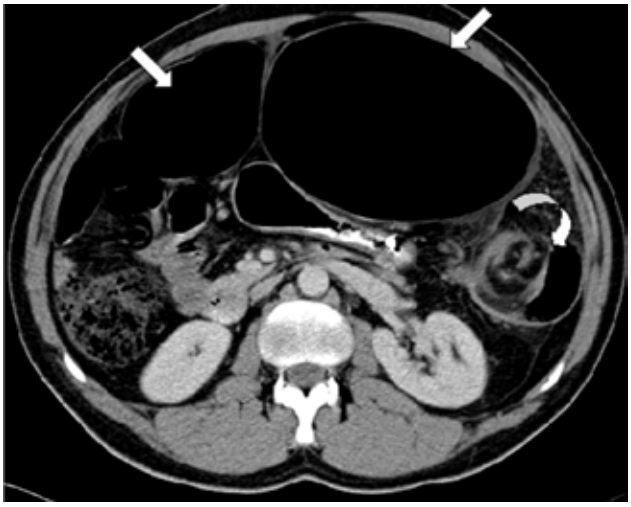

Figure 3 - CT scan revealing the 2 dilated loops of the splenic flexure (straight arrows) with the characteristic whirl sign (curved arrow). CT-computerised tomography.

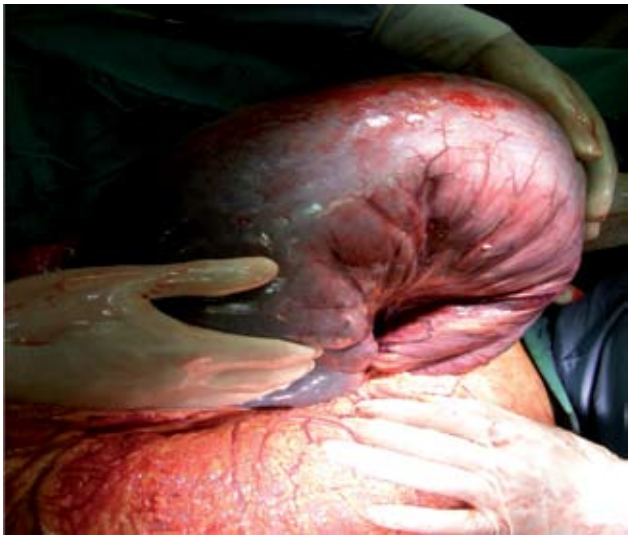

Figure 4 - Laparotomy revealing the distended gangrenous splenic flexure volvulus.

of large bowel obstruction secondary to the volvulus of splenic flexure was made. After correcting the fluid and electrolyte deficit, the patient underwent emergency laparotomy. The splenic flexure was grossly distended, gangrenous, and measured 20 cms (**Figure 4**). It had a clockwise 360^0 twist on itself and involved the adjoining transverse, and descending colon. The splenocolic and phrenocolic ligaments were absent and the proximal descending colon was intraperitoneal. The patient had a double closed loop obstruction. The other being dilated proximal large bowel with a competent ileo-cecal valve. The gangrenous splenic flexure was resected, and the ends of the proximal transverse and distal descending colon were primarily anastomosed in 2 layers with vicryl. After a thorough peritoneal lavage the abdomen was closed. The postoperative period was uneventful except for pyrexia due to superficial surgical site infection, managed by local drainage and antibiotics. A swab failed to grow any organisms. Histology was reported as large bowel volvulus consistent with infarcted bowel. The patient remained well when followed up the second postoperative week at the outpatient clinic.

Discussion. The SFV is extremely rare and Ballantyne et al[2] in his colonic volvulus series reported an incidence of less than 2% of all colonic volvulus. Among over 32 cases of SFV that have been reported in the literature to date, most are secondary to mobilization of the splenic flexure during previous surgery.[2,4] The rarity of SFV is due to the fact that this part of the large bowel has limited mobility due to its attachment to phrenocolic, gastrocolic, and splenocolic ligament and the intraperitoneal position of the descending colon.[2,4,5] For SFV to occur some or all of these anatomical factors should be congenitally absent or altered by surgery, thus rendering the flexure unusually mobile. The SFV has been reported with other associated congenital anomalies including wandering spleen causing volvulus of the splenic flexure by partial obstruction of the large intestine by the splenic pedicle,[5,6] and in Chilaiditi syndrome (hepatodiaphragmatic interposition of the intestine) where splenic flexure is redundant due to absence of peritoneal attachments.[7] Congenital bands, and acquired adhesions due to previous surgeries have also been postulated as etiological factors of this rare problem.[4,7] Other predisposing factors that find mention in the literature include underlying motility disorders associated with chronic idiopathic intestinal pseudo-obstruction syndrome resulting in the transverse colon and the mesentry gradually increasing in length and width.[4,8] The elongated mesentery of the transverse colon rotates in a clockwise direction, and presses the distal part of the splenic flexure. In a review of 5 children with SFV ranging from 26 months to 13 years of age, Osuka et al[8] reported motility disorders to be the underlying cause in 3 of them. Recently, eventration of the diaphragm has been reported to be the cause for chronic recurrent SFV.[9] However, in our patient it appeared that the congenital absence of the splenocolic and phrenocolic ligaments and intraperitoneal location of the proximal part of the descending colon are the predisposing factors.

Though, there are reported cases of SFV in children,[8] the median age of SFV is 53 years, with female preponderance.[2,4] The usual presentation of these patients is non-acute, and non-specific, and includes recurrent episodes of abdominal pain, distension, and vomiting.[2,4,5,7-9] In such cases, the diagnosis of SFV is usually not suspected due to the rarity of this condition. Acute presentation with features of gangrene is rare (**Figure 4**). If radiological investigations are carried out a preoperative diagnosis could be suggested based on certain characteristic findings.[4,10] These radiological signs were illustrated in our patient and included: 1) Two widely separated air fluid levels, one in the distended splenic flexure and the other in the cecum (**Figure 1**). 2) Markedly dilated air filled colon with abrupt termination at the anatomic splenic flexure. 3) An empty descending, and sigmoid colon. 4) A characteristic beak at the anatomical splenic flexure on barium enema examination when carried out. 5) A coffee bean appearance of the dilated splenic flexure is seen, and in SFV the concavity of the bean faces to the left upper abdomen (**Figure 2**) unlike in sigmoid volvulus where it faces to the left lower abdomen. 6) The CT scan will reveal dilated splenic flexure with a characteristic whirl sign at the site of twist in the mesentery (**Figure 3**).

The first priority is given to adequate resuscitation of the patient as in other cases of large bowel obstruction.[1-4] The options available for treatment include decompressing, colopexy, or resection.[2-10] If the patient with SFV does not have peritonitis or suspected gangrene, deflation by colonoscopy could be attempted.[2,4,8] Simple deflation however, without operative fixation or resection is followed by subsequent episodes of volvulus with its own attendant complications, and mortality. In the event the volvulus cannot be reduced endoscopically or there are signs of mucosal ischemia, immediate surgery is indicated. Hence the timing, and nature of surgery for SFV are determined by 2 main factors. These include suspected presence of ischemia or necrotic bowel and the success or failure of colonoscopic reduction.[4]

When resection is carried out in the presence of gangrenous bowel with prior perforation of the sigmoid colon and significant peritoneal soiling, primary anastomosis is avoided. Exteriorization of the proximal and distal colon may then be necessary.[4] A primary

anastomosis when carried out in such patients leads to a high incidence of anastomotic leak. However, as in our case in the absence of peritoneal soiling, and viable bowel ends, primary anastomosis can be safely carried out. Non resectional colopexy by fixing the splenic flexure to the surrounding structures (pexy of the splenic flexure) in order to prevent the volvulus[1,2,4,8] can be tried in a high risk or elderly patient who is a poor surgical candidate.[4] This is achieved by using non absorbable suture materials, and prevents recurrent twisting of the colon without the need for resection or colostomy.[4,9] The colon could also be fixed using Gore-tex strips or extraperitonealisation to anchor the redundant colon.[2,4,9] Okusa[8] et al in a review of 5 SFV cases in children reported resection to have been carried out in 2 patients, and colopexy in one of them. In a review of one of the large series of 14 cases of SFV, Ballantyne found spontaneous reduction in 2 patients while 11 of them required emergency surgery.[4] Three of these patients had operative derotation, one exteriorization of splenic flexure as loop colostomy and in 6 patients a partial colectomy was carried out. There was only one death in their series.[4] Thus, the choice of treatment is varied and depends upon the type of presentation and has to be tailored to each patient.

In summary, SFV is a rare cause of intestinal obstruction. While most of them may have subacute presentation, an acute presentation with gangrene is a potential complication. Preoperative diagnosis is aided by radiological investigations. Treatment options depend on the presence or absence of gangrene with resection of splenic flexure having a good long-term outcome. Awareness of the clinical entity will help in early diagnosis and appropriate management.

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Related topics

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