

Splenic Flexure Volvulus in a Young Woman; Atypical Presentation

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Abstract

Splenic flexure volvulus is a rare clinical entity making up less than 2% of colonic volvulus cases. Due to the rarity of this condition the index of suspicion is low, making its prompt diagnosis and management unlikely. Splenic flexure volvulus may happen in children due to the absence or malformation of the ligaments that hold the splenic flexure in place. On the other hand, it may also occur in adults due to laxity of those ligaments, for example, secondary to previous abdominal surgery.

In most cases if patients are presenting acutely they will present with large bowel obstruction otherwise in the chronic setting they may present with chronic abdominal pain and chronic constipation. Here, we will present a splenic flexure volvulus case report about a middle-aged female who presented to the emergency department with acute abdominal pain, abdominal distention and vomiting. Computed Tomography (CT) renal without contrast was useful and illustrated the radiological signs of the splenic flexure volvulus. Urgent laparotomy was ultimately performed on the patient which revealed a gangrenous splenic flexure volvulus. It was resected with transverse end colostomy formation. Literature review is done in this case report taking into consideration the common etiologies, predisposing factors, clinical presentation, investigation and management of patients that presented with splenic flexure volvulus.

Keywords: *Volvulus; Splenic Flexure*

Introduction

Large bowel obstruction is a repeatedly encountered condition in the healthcare field, therefore making it a crucial disorder to be recognized and treated appropriately. Volvulus of the large bowel makes up only about 1 - 7% of large bowel obstruction cases, where the most frequently encountered location is at the sigmoid colon or the caecum [1]. Colonic volvulus at the splenic flexure is the least common form of colonic volvulus where in 2008 only less than 100 cases were reported in literature [2]. The reason that this condition is so unusual stems from the fact that the splenic flexure of the colon is held in a fairly stable position in the left hypochondrium [3]. The causes of the colonic volvulus at the splenic flexure are either thought to be congenital or acquired [2,4,5]. Due to the high risk of mortality of this condition, clinical awareness needs to be further acknowledged [6].

Here we will present a case of a female patient who presented to the emergency department with severe acute abdominal pain and was discovered to have colonic volvulus at the splenic flexure.

Case Presentation

A 43 years old female, known case of hypothyroidism and sickle cell trait presented to the emergency department with severe dull abdominal pain that started at the left flank area then became generalised. The pain started two days ago and has been progressive since then. This was her first time experiencing this kind of pain.

Along with the pain, the patient reported two episodes of vomiting food content. She also stated she has been having constipation where her last bowel motion was 3 - 4 days before presentation. Initially, she presented to local health centre and was given analgesia but there was no relief of the pain. The patient denied fever, pararectal bleeding or any other complains.

Her past surgical history was significant for a caesarean section done 11 years ago.

When the patient was seen by the general surgery team, all her vitals were stable: heart rate was 90 bpm, blood pressure 128/60 mmHg, temperature 37.2°C and the oxygen saturation was 100%.

On general inspection, the patient looked in severe pain and was tachypnoeic. On examination, generalized abdominal distention with generalized tenderness maximally at the left lumbar area was noted. There was no guarding, rigidity or rebound tenderness. There were no features that suggested peritonitis. The patient refused PR examination to be done.

Upon investigation, complete blood count (CBC) was done and showed a white blood cell (WBC) count of $5.45 \times 10^9/L$, haemoglobin 12.5 g/dL, and platelet count of $292 \times 10^9/L$. Her C-reactive protein was 1.

Venous blood gas was also done and showed pH of 7.527, pCO_2 19.8, pO_2 30.4 HCO_3 16.1, glucose 6.24 and lactate of 2.4.

Electrolyte levels were normal along with the urine analysis.

On radiological imaging, plain film abdomen was performed and showed a wide area of gases shadow at left hypochondria (dilated gastric or intestinal shadow). Coffee bean sign was also seen. Computed tomography (CT) renal without contrast was performed and showed positive swirls sign at the left hypochondria that involves the splenic, partially transverse and the descending colon and was associated with significant dilatation of splenic flexure (Figure 1). The reported conclusion of the CT scan was that the findings were consistent with volvulus at level of left splenic flexure level (Figure 2).



Figure 1: CT renal without contrast [axial image] illustrating positive swirl sign at the left hypochondria pointed by the arrow.

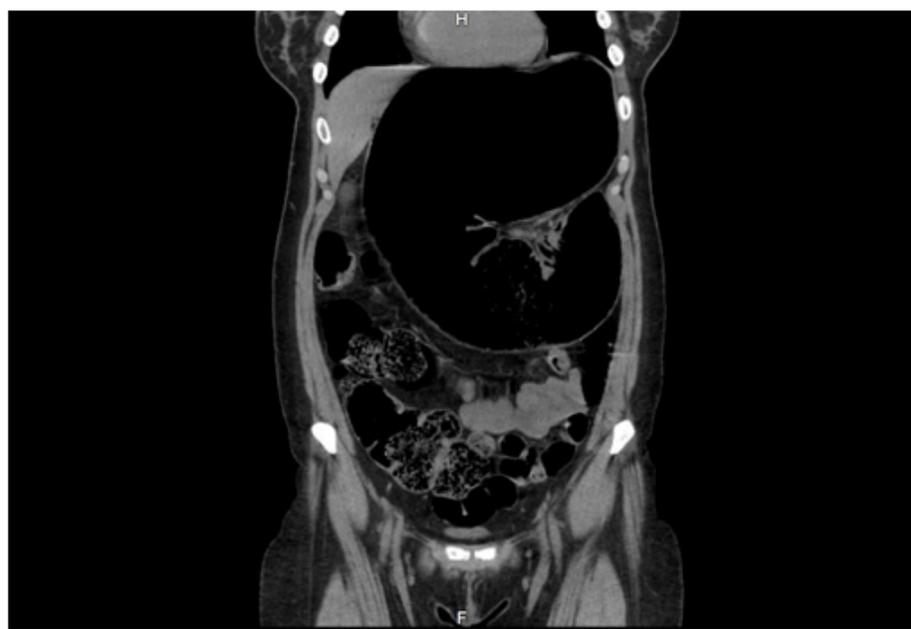


Figure 2: CT renal without contrast showing the volvulus at level of left splenic flexure level.

All the risks and benefits were explained to the patient and her relatives regarding the need for urgent colonoscopic decompression VS surgery. They agreed for the colonoscopy, taking into account the high risk of perforation with the possibility of conversion to surgery if required. The patient then underwent urgent colonoscopy and attempted decompression but during the colonoscopy there was evidence of colonic ischemia. Therefore, in view of the endoscopic findings and progressive pain and abdominal distension of the patient the decision was made to proceed with urgent exploratory laparotomy.

During the operation, there were two perforations noted at the splenic flexure with a hugely distended transverse and descending colon. Large hematoma at the area of perforation was seen along with a collapsed large bowel at the hepatic flexure site. The ascending, transverse and descending colon were all on the mesentery. There was a redundant transverse and sigmoid colon. Ultimately, colonic volvulus at the splenic flexure was also seen (Figure 3 and 4).

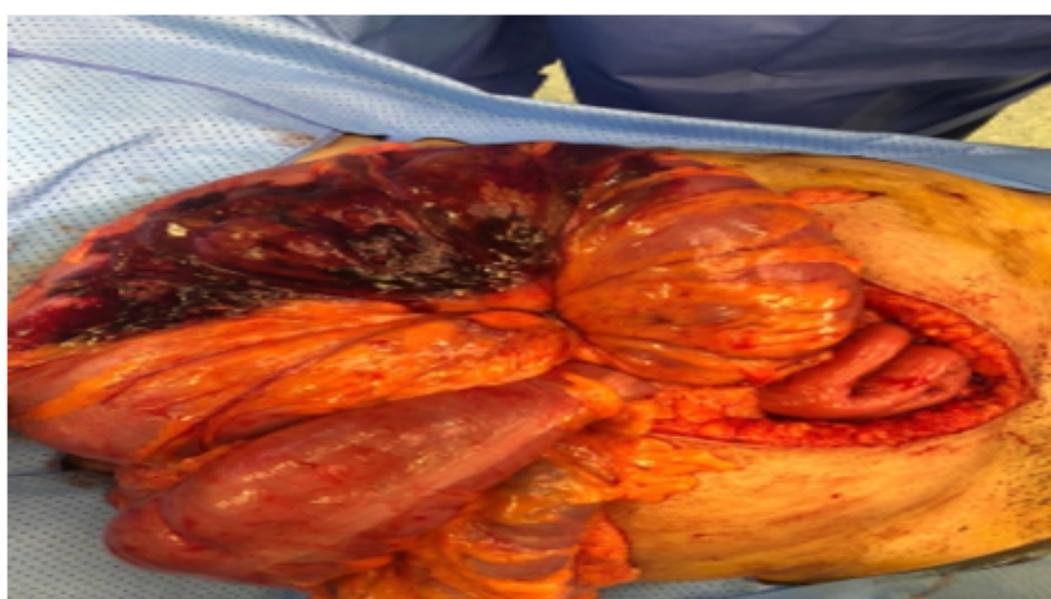


Figure 3



Figure 4

Hence, the patient had to undergo distal transverse, descending and proximal sigmoid resection with transverse end colostomy. The patient tolerated the procedure well and left the operating room in good condition.

Specimens of the colon were sent for histopathology. Histopathological analysis macroscopically showed the surrounding mucosa had hemorrhage, flattening and edema. There was no evidence of diverticulosis, polyp or mass. Microscopically, it showed the colonic wall had hemorrhage and necrosis of the mucosa with transmural inflammation around the perforation site. The reported conclusion made of the findings was consistent with perforation and volvulus clinically.

Post-operatively the patient was admitted to our institution for observation. She passed stool on the 3rd post-operative day and was discharged on the 6th post-operative day. Upon discharge the patient was doing well and her all vitals were stable. Her wound examination showed a clean wound with minimal discharge where Aquacel dressing was applied. The stoma was healthy and functioning with soft stool. She was seen in the surgery clinic a week after discharge and was doing well.

Discussion

When the colon rotates around its mesenteric axis, it results in torsion or volvulus of the colon. This gives rise to intestinal lumen obstruction and narrowing of the mesenteric vessels leading to potential ischemia, necrosis or even perforation of the bowel [2,6-8].

Volvulus of the large bowel makes up on average 1 - 7% of intestinal obstruction cases [1]. The most common location where the colonic volvulus occurs is at the sigmoid colon which makes up 80% of cases. The second most common location is the cecum making up 15% of cases. The transverse colon is an atypical location for intestinal volvulus to occur, with an incidence rate of 3%. Lastly, the rarest location is at the splenic flexure where the incidence rate is only 1 - 2% of cases in adults [5,7,9]. Up until 1953, splenic flexure volvulus was an unrecognized cause of intestinal obstruction with the first case being reported by Glazer and Adlersberg [2,3].

The reason that the splenic flexure is such a rare place to find volvulus formation is attributed to the fact that the splenic flexure is secured in place by three ligamentous attachments: the phrenocolic ligament, splenocolic ligament and the gastrocolic ligament. These attach the splenic flexure to the diaphragm, spleen and the stomach respectively. These ligaments keep the splenic flexure in place causing restriction in mobility [3,4,10-12].

The etiology of splenic flexure volvulus is thought to be either congenital or acquired. Congenital causes most often present in the paediatric population with the reasoning being that there is absence or malformation of the ligaments mentioned above [3,4]. On the other hand, acquired causes may be prior abdominal surgery leading to adhesions, pregnancy, colonic dysmotility and chronic constipation [2,5,7,10]. All these factors give result in laxity of splenic flexure which pre-disposes the patient to volvulus.

Chronic constipation has been shown to play an important role in the development of volvulus in the view that it causes distention of the colon with the stretching of the mesentery leading to volvulus formation [1,3].

The above factors mentioned can be illustrated in the literature review done by Ballantyne where he compared 14 cases of splenic flexure volvulus. In his review, 9 out of the 14 patients had undergone abdominal surgery in the past. Along with that, 43% of the cases had been having constipation [3].

Furthermore, this can also be demonstrated in our case report where the patient has been suffering from constipation as well.

Neuropsychiatric conditions such as cerebral palsy or intellectual disability [3,4] have also been thought to have an association with splenic flexure volvulus. This can be exemplified in literature where in a quite number of cases reported the patient had some kind of neuropsychiatric disorder. The conclusion that has been deducted is that volvulus tend to occur as a result of chronic constipation that the patients may have been having due to their neuropsychiatric disorder [3,4,11,12].

Patient with splenic colonic volvulus tend to be mostly females in their second or third decade of life [7]. Sixty eight percent of patients with this disease present with chronic recurrent abdominal pain associated with vomiting, constipation and abdominal distention [11]. In the acute setting, patients may present with acute colon obstruction associated with gangrene and even peritonitis [4,5,11]. Rarely, it may also present with small bowel obstruction [4,12].

Due to the rareness of the condition the diagnosis is primarily made with the help of radiological findings. In emergency situations, CT scan of the abdomen and pelvis often leads to the diagnosis. In non-emergent cases the use of barium enema is generally informative [1]. X-ray of the abdomen has been shown to be less diagnostic than other types of radiology [11]. Radiographically, splenic flexure volvulus is suggested when there is:

- (a) Markedly dilated, air-filled colon with an abrupt termination at the splenic flexure.
- (b) Presence of two widely separated air-fluid levels, one in the transverse colon and the other in the caecum.
- (c) An empty descending and sigmoid colon, and
- (d) A characteristic bird-beak signs at the distal part of splenic flexure on barium enema [5,7].

Along with that, the “coffee bean” sign appearance of the dilated colon can also be appreciated. In splenic flexure volvulus, the concavity of the “bean” faces the left upper abdomen as opposed to sigmoid volvulus where it faces the left lower abdomen. The combination of the coffee bean sign and CT whirl sign have illustrated the greatest specificity and sensitivity for the diagnosis [5,6]. Similarly, in our patient, her CT scan showed positive swirls sign at left hypochondria. It involved the splenic, partially transverse colon and descending colon and was associated with significant dilatation of splenic flexure.

Regarding the primary surgical management of this condition, it is all determined by the stability of the patient and the viability of the bowel [1,5]. Spontaneous detorsion with the use of barium enema has been noted in a few of the reported cases [3,12]. Detorsion with the use of colonoscopy can also be tried first but it has been associated with a high rate of recurrence and perforation therefore it is not routinely recommended [7,9,10].

In the high risk or elderly patients operative detorsion with colopexy or tube colostomy for colonic fixation has been suggested as an alternative mode of management. However, it is not recommended as well due to the high incidence of recurrence [12].

Above all, the ideal preferred management method for an acutely unwell patient with splenic flexure volvulus is resection of the colon with end colostomy formation located at the transverse colon [2,12]. This is especially necessary in patients who have ischemia of the bowel [12]. In addition, resection of the bowel has also been shown to prevent further recurrence regardless of whether the bowel was gangrenous or not. Extended left hemicolectomy is the procedure of choice [9]. Reversal with anastomosis is usually recommended 3 to 6 months after the surgery [2].

When looking at other case reports of splenic flexure volvulus, most of the patients needed an emergency laparotomy to be performed. For instance, in Ballantyne's literature review 11 out of the 14 patients had an emergency laparotomy performed and six of them had to undergo partial colectomy [3]. This can be further illustrated in our case where our patient underwent exploratory laparotomy with distal transverse, descending and proximal sigmoid resection with transverse end colostomy, after an unsuccessful trial of colonoscopic detorsion.

Another interesting finding in a case report, showed that splenic flexure volvulus has expressed a tendency to occur in standing positions. In that case, posture advice such as the knee-chest position and abdominal compression using colonic intraluminal pressure resulted in effective resolution of the patient's pain attacks as a consequence of the intermittent volvulus formation [13].

Conclusion

In conclusion, although colonic volvulus at the splenic flexure is a rare condition it should still be considered in the differential diagnosis in patients with signs of large bowel obstruction. With an incidence rate of only 2%, splenic flexure volvulus and its subsequent complications remains an important topic to be discussed due to the seriousness and the high risk of mortality associated with it. Early recognition of the signs and symptoms with prompt treatment is essential.

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