

# Primary splenic flexure volvulus

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## ABSTRACT

**Primary splenic flexure volvulus is a rare entity. We report an acute presentation of primary splenic flexure volvulus with gangrene in a 24-year-old man. Radiograph showed a massively-dilated large bowel loop with a coffee-bean sign. At emergency laparotomy, a distended and gangrenous splenic flexure was found, with absence of all three ligamentous attachments of the splenic flexure.**

**Keywords: acute abdomen, bowel gangrene, coffee-bean sign, splenic flexure volvulus, volvulus**

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## INTRODUCTION

The sigmoid colon, caecum and ascending colon are common sites of the large bowel volvulus. The splenic flexure, however, is a rare site of volvulus due to its attachment by the phrenicocolic, gastrocolic and splenocolic ligaments. Primary splenic flexure volvulus is rare and it is usually due to congenital absence or laxity of the above-mentioned ligaments. Less than 30 cases of splenic flexure volvulus have thus far been reported in the English literature.

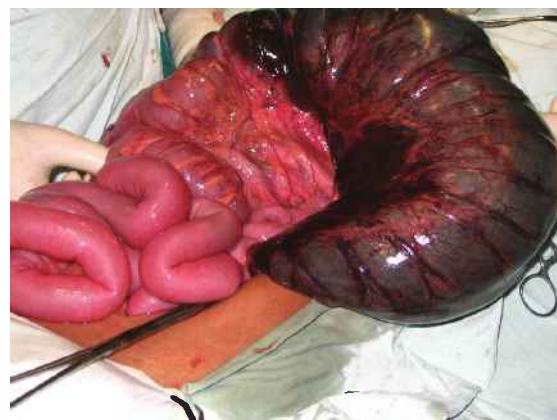
## CASE REPORT

A 24-year-old man was referred from a primary care centre with a four-day history of abdominal pain, distension, vomiting and fever. He had post-polio residual paralysis of the lower limbs due to polio infection in childhood. He did not have any other comorbidities and had not undergone previous abdominal surgery. On examination, he was tachycardic and tachypnoeic. His abdomen was distended, with generalised guarding and board-like rigidity. Rectal examination was normal. The radiograph of the abdomen revealed a massively-dilated large bowel loop with a coffee-bean sign (Fig. 1).

At emergency laparotomy, a distended and gangrenous splenic flexure, which had twisted two and half times in the clockwise direction, was found (Fig. 2). All three ligamentous attachments of the splenic flexure (phrenicocolic, gastrocolic and splenocolic ligaments) were absent. The spleen was normal in position and there was no associated



**Fig. 1** Supine radiograph of the abdomen shows the “coffee-bean” sign, with the concavity facing the left upper abdomen.



**Fig. 2** Operative photograph shows the gangrenous splenic flexure, after untwisting of the volvulus.

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malrotation of the gut or congenital bands. The volvulus was untwisted and the gangrenous large bowel resected. Primary anastomosis was not done and the resected ends were brought out as end colostomy and mucous fistula. The patient required prolonged ventilatory

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support, but otherwise had an uneventful postoperative recovery. He was discharged and advised to return for stoma closure and restoration of bowel continuity.

## DISCUSSION

Volvulus of the gut is defined as a rotation of a segment of bowel around its own mesentery, causing narrowing and obstruction of the two ends at the point of rotation.

This phenomenon was first described by Von Rokitsansky in the mid-nineteenth century. The incidence of volvulus of the large bowel varies widely, according to the population studied. In the Western population, large bowel volvulus accounts for 1%–5% of all large bowel obstructions. The most common site of large bowel torsion is the sigmoid colon (80%), followed by the caecum (15%), transverse colon (3%) and splenic flexure (2%). Colonic volvulus is common in regions of Africa, southern Asia and South America. In the “volvulus belt” of Africa and the Middle East, 50% of large bowel obstructions are due to volvulus, almost exclusively of the sigmoid colon.<sup>(1)</sup>

Splenic flexure volvulus is extremely rare and Ballantyne et al, in his series on colonic volvulus, reported an incidence of less than 2% of all colonic volvulus.<sup>(1)</sup> Only about 30 cases of splenic flexure volvulus have been reported in literature to date and about two-thirds of these were secondary to mobilisation of the splenic flexure during previous surgery.<sup>(2)</sup> Splenic flexure volvulus is rare because this part of the large bowel has limited mobility due to the phrenicocolic, gastrocolic and splenocolic ligaments and the retroperitoneal position of the descending colon. For the splenic flexure volvulus to occur, some or all of these anatomical factors should be congenitally absent or altered by surgery, thus rendering the flexure unusually mobile.<sup>(3)</sup> Havenstrite et al reported a case of splenic flexure volvulus associated with Chilaiditi syndrome (hepatodiaphragmatic interposition of intestine), where the splenic flexure was redundant due to absence of peritoneal attachments.<sup>(4)</sup> Moorthy et al reported a case of wandering spleen causing volvulus of the splenic flexure by partial obstruction of the large intestine by the splenic pedicle.<sup>(5)</sup> Congenital bands and acquired adhesions due to previous surgery have also been postulated as aetiological factors of this rare problem.<sup>(3)</sup>

The presentation is usually non-acute with recurrent episodes of abdominal pain, distension and vomiting. In such cases, the diagnosis of splenic flexure volvulus is usually not suspected, due to the rarity of this condition. The acute presentation with features of gangrene and peritonitis is rare.<sup>(6)</sup> In the appropriate clinical setting,

radiographical diagnosis of a splenic flexure volvulus is suggested when the following signs are seen: (a) a markedly dilated, air-filled colon with an abrupt termination at the anatomic splenic flexure; (b) 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 beak at the anatomical splenic flexure at a barium enema examination.<sup>(7)</sup> The “coffee bean” appearance of the dilated colon is also seen and 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.

Ballantyne, in his case series, reviewed 14 patients with splenic flexure volvulus.<sup>(6)</sup> Previous abdominal surgery, anomalies of fixation, and constipation played important roles in the pathogenesis. In two patients, the volvulus reduced spontaneously, while 11 patients required emergency surgery. Three patients underwent operative derotation, one patient needed exteriorisation of the splenic flexure as a loop colostomy, and six patients had partial colectomy. There was only one death among the 14 cases.

As in other causes of large bowel obstruction, the first priority is given to adequate resuscitation of the patient. The options available for treatment include decompression, colopexy or resection. If the patient with splenic flexure volvulus does not have peritonitis or suspected gangrene, deflation by colonoscopy could be attempted. Simple deflation, without operative fixation or resection is followed by subsequent episodes of volvulus, with its own attendant complications and mortality. If the volvulus cannot be reduced endoscopically or there are signs of mucosal ischaemia, immediate surgery is indicated.

The timing and nature of surgery for sigmoid volvulus are determined by two main factors: firstly, suspected presence of ischaemic or necrotic bowel and secondly, success or failure of colonoscopic reduction. The surgical management of splenic flexure volvulus consists of resection of the redundant bowel, or by fixing the splenic flexure to the surrounding structures (pexy of the splenic flexure), in order to prevent the volvulus. Non-resectional colopexy can be tried in high-risk or elderly patients who are poor surgical candidates. The colopexy techniques designed to prevent recurrent twisting of the colon without resection or colostomy include the use of non-absorbable sutures, Gore-Tex strips, or extraperitonealisation to anchor the redundant colon.

Although treatment by colonoscopic reduction and transverse colopexy have been described, splenic flexure volvulus is best treated by a resectional procedure. The suspicion of ischaemic or necrotic

bowel mandates laparotomy and resection of the compromised segment. When resection is done in the presence of gangrenous bowel, prior perforation of the sigmoid and significant peritoneal soiling, it is advisable to avoid primary anastomosis. Exteriorisation of the proximal and distal colon may be necessary. A primary anastomosis in this setting carries a high incidence of anastomotic leak. Absence of peritoneal soiling and viable bowel ends are prerequisites if a primary anastomosis is to be performed. Thus, the choice of treatment depends upon the type of presentation and has to be tailored to each patient. Awareness of this clinical entity will help in early diagnosis and appropriate management.

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