

CASE REPORT

Synchronous volvulus of the sigmoid colon and caecum, a very rare cause of large bowel obstruction

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SUMMARY

Colonic volvulus usually occurs as a single event that can affect various parts of the colon. The usual sites affected being the sigmoid colon (75%) and the caecum (22%). The phenomenon of multiple sites simultaneously undergoing volvulus is an extremely rare occurrence. Synchronous double colonic volvulus is extremely rare and to the best of our knowledge, this is the 4th reported case of simultaneous sigmoid and caecal volvulus in the English literature. The clinical presentation and the radiological findings are that of large bowel obstruction. Classic radiological findings may not be present or may be overlooked due to its rarity. Treatment of this condition is early surgical intervention to prevent the sequelae of a colonic volvulus and its associated mortality. We report a case of an 80-year-old man with synchronous volvulus of the sigmoid colon and caecum.

BACKGROUND

Synchronous volvulus of the sigmoid colon and caecum is an extremely rare clinical entity. To the best of our knowledge, this is the fourth reported case of synchronous volvulus involving both the sigmoid colon and caecum. Its rarity requires it to be reported and brought to the attention of practicing surgeons as an unusual cause of large bowel obstruction. Prompt surgical intervention is key to decreasing the morbidity and mortality associated with this uncommon condition.

CASE PRESENTATION

An 80-year-old man, a patient with known hypertension and previous ischaemic stroke presented to our institution with a 2-day history of sudden onset abdominal distension and abdominal pain. He also reported of multiple episodes of vomiting and retching associated with constipation and inability to pass flatus. The patient has a history of chronic constipation and his drug history is significant for nifedipine 20 mg once daily. No recent weight loss or a family history of cancer was elicited.

He suffered an ischaemic stroke 1 year prior and lost the ability to move the entire right side of his body. He resides in an extended care facility for elderly individuals.

Examination revealed an elderly man in mild painful distress. His vital signs were significant for a tachycardia of 110 bpm and regular with the rest falling within normal limits. Mild dehydration was noted. Inspection of the abdomen revealed a

markedly distended abdomen with mild tenderness to palpation throughout with the absence of guarding and rebound tenderness [figure 1](#).

Digital rectum examination revealed an empty rectum, enlarged prostate with no other masses palpable.

INVESTIGATIONS

Full blood count and electrolytes were within normal limits.

Chest X-ray: Chilaiditi sign with dilated loops of bowel causing elevation of both hemidiaphragms [figure 2](#).

Abdominal X-ray: Dilated loops of large bowel [figures 3 and 4](#).

CT scan abdomen/pelvis with intravenous contrast:

On initial evaluation, it was reported as dilated loops of large bowel, maximum diameter 11 cm with a transition point in the sigmoid colon with collapsed small bowel [figure 5](#).

However, on retrospective review (postsurgical intervention): CT scan demonstrated a sigmoid volvulus with an identifiable whirl sign [figures 6 and 7](#).

A caecal volvulus was not appreciated on this scan.

DIFFERENTIAL DIAGNOSIS

Diagnosis was large bowel obstruction secondary to a tumour.

TREATMENT

After a period of resuscitation, the patient was taken for emergency exploratory laparotomy. Findings include markedly dilated large bowel with a sigmoid volvulus and caecal volvulus. The sigmoid colon was twisted in a clockwise manner and the caecum was twisted in an anticlockwise manner, [figures 8 and 9](#). A long and redundant sigmoid colon was noted with an associated long mesentery. [Figure 10](#) Scattered diverticulae were seen throughout the large bowel with no masses or additional pathology noted. Although the bowel was dilated, there were no serosal tears appreciated and the large bowel appeared viable. The small bowel was collapsed and there were no gross abnormalities noted.

A subtotal colectomy was performed with a side-to-side ileorectal stapled anastomosis.



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Figure 1 Distended abdomen on inspection.

OUTCOME AND FOLLOW-UP

The postoperative period was uneventful and the patient was discharged 7 days postoperation. He represented to our hospital with symptoms of intestinal obstruction and on day 2 of admission, it was noted that there was a foul smelling discharge on the inferior aspect of the laparotomy scar with associated peritonism on abdominal examination. An enterocutaneous fistula was suspected and the decision for definitive surgical management was made. On operation he was found to have a breakdown of the anastomosis and extensive adhesions. An end ileostomy was fashioned after extensive adhesiolysis and through abdominal washout.

DISCUSSION

Colonic volvulus is an axial twist of a portion of the colon along its mesentery. The word volvulus is derived from the Latin term *volvare* which means to twist. This twisting will result in either a complete or partial obstruction of the bowel with associated arterial and venous compromise. As a result, quick and accurate diagnosis is required to expedite treatment for this potentially fatal condition.

Volvulus itself is an unusual cause of intestinal obstruction accounting for ~5% of cases of gastrointestinal obstruction and 10–15% of large bowel obstruction.¹ The most common

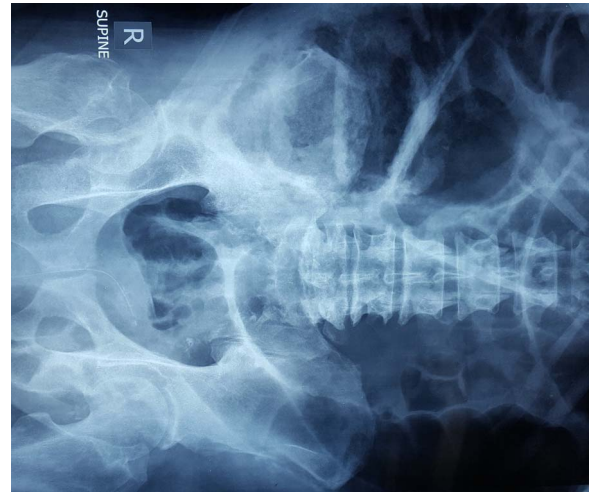


Figure 3 Abdominal X-rays demonstrating dilated loops of large bowel.

locations for colonic volvulus are the sigmoid colon (75%), caecum (15%), transverse colon (3%) and splenic flexure (2%).^{1–3}

Having a synchronous volvulus of multiple portions of the bowel is an exceedingly rare occurrence. To the best of our knowledge, our case is the third case in the English literature reporting simultaneous volvulus of the sigmoid colon and the caecum and the fourth case worldwide.^{4–6} Of note is that synchronous twisting or multiple twisting of the gastrointestinal tract have been reported earlier. Recently, Islam *et al*⁷ reported simultaneous torsion of both the splenic flexure and caecum, the only reported entity in the English literature to date. Similarly, Chittal *et al*⁸ reported a case of gallbladder and sigmoid colon volvulus. Lianos *et al*² reported a case of volvulus of the sigmoid and transverse colon. In addition, Elsharif *et al*³ reported a case of triple volvulus involving the stomach, caecum and sigmoid colon in a patient with partial situs inversus.

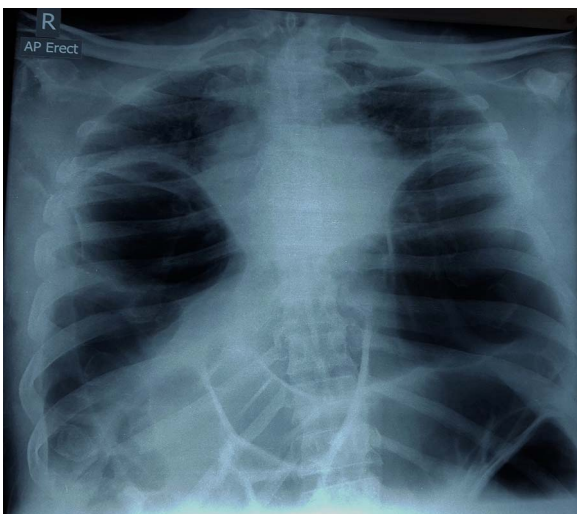


Figure 2 Chest X-ray demonstrating Chilaiditi's sign with bilateral elevated hemidiaphragms and dilated large bowel.

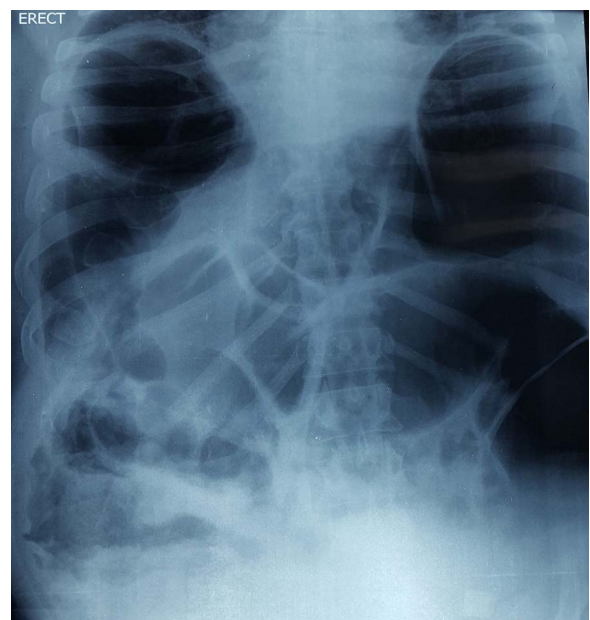


Figure 4 Abdominal X-rays demonstrating dilated loops of large bowel.

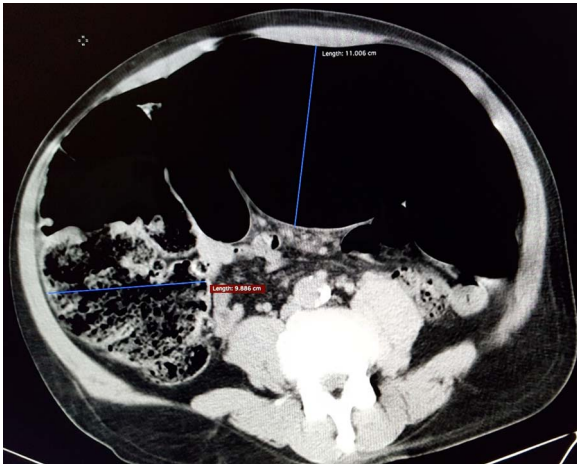


Figure 5 CT scan abdomen showing dilated large bowel, maximum transverse diameter 11 cm with collapsed small bowel.



Figure 6 Scout CT film showing dilated large bowel and sigmoid volvulus.

The usual patient who presents with volvulus is described as an elderly, institutionalised individual with a history of chronic constipation and often on psychotropic medication. Other possible associations that have been cited include previous abdominal surgery with subsequent adhesional bands, laxative use and diuretics.^{9–12} In a younger patient group, volvulus is associated with disorders of abnormal colonic motility or causes of mega-colon notably Hirschsprung disease and Chaga's disease.^{13–16}

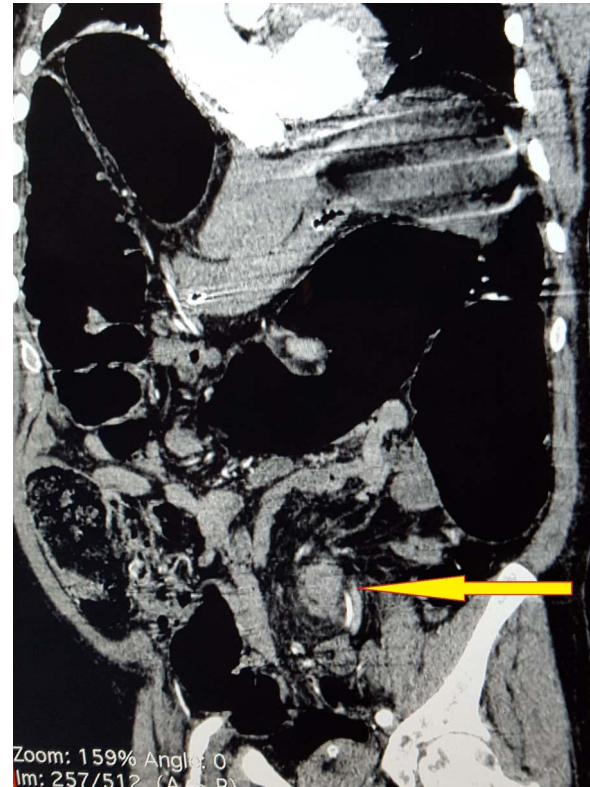


Figure 7 CT scan abdomen demonstrating whirl sign indicative of sigmoid volvulus.

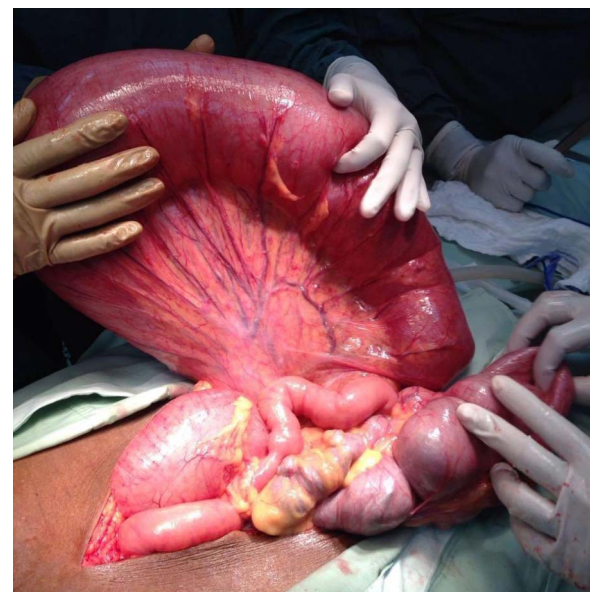


Figure 8 Intraoperative photograph showing sigmoid volvulus.

Notably, there has been association with Chilaiditi syndrome and colonic volvulus. Chilaiditi syndrome is defined as a colonic interposition between the liver and the right hemidiaphragm, first described in 1910 by Demitrius Chilaiditi.¹⁷ When this sign is associated with symptoms such as abdominal pain, vomiting or respiratory depression, just to name a few, it is called Chilaiditi syndrome. There are reports of Chilaiditi syndrome being associated with volvulus of the caecum, transverse colon and the splenic flexure of the colon.^{18–21}

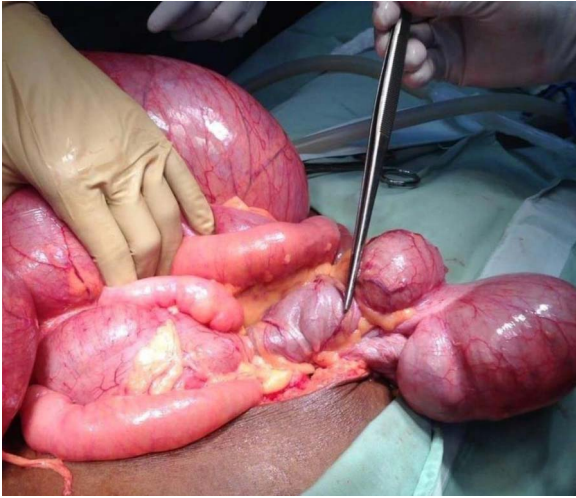


Figure 9 Intraoperative photograph demonstrating the point of twisting for the caecal volvulus.

Many theories have been proposed to explain colonic torsion. Chronic constipation is thought to cause mesenteric stretching which predisposes to torsion. Having a long mesentery as well as surgical division or congenital absence of the gastrocolic, phrenocolic or splenocolic ligaments have all been suggested as possible risk factors.^{5 9–12} We suspect that having a long mesentery and a redundant sigmoid colon along with the history of chronic constipation predisposed our patient to have a double volvulus.

The diagnosis of this condition is usually made at laparotomy despite a thorough history, examination and appropriate radiological investigations.^{4–7} Simple X-rays may show large bowel obstruction with typical features of sigmoid or caecal volvulus absent as one entity may alter the appearance of the other. Similarly, with CT imaging the diagnosis may be missed due to the rarity of the condition or the mass effect of one volvulus on the other.⁷ In our case, the diagnosis was missed radiologically; however, on retrospective review, only a sigmoid volvulus could be positively identified on CT imaging.

The treatment of double volvulus depends on the viability of the bowel, the presence of concomitant pathologies and haemodynamic stability of the patient. For necrotic bowel, resection is mandatory with either primary anastomosis or subsequent ostomy formation. For a viable bowel, the treatment is



Figure 10 Colectomy specimen.

controversial. Examination of the bowel is necessary to rule out coexisting pathologies such as carcinoma or a megacolon. Of note, Chung *et al*²² stated that the presence of a megacolon is a significant predictor of recurrence. In the presence of a megacolon, the incidence rate of recurrent volvulus can be as high as 82%.²³

If the option of resection is chosen, the decision between performing an ostomy versus primary anastomosis must be made. The advantages of performing a primary anastomosis are obvious as there are several drawbacks associated with a colostomy which include:

1. Increases psychological stress and financial strain on the patient in addition to the associated complications associated with an ostomy;^{24 25}
2. Restoration of intestinal continuity involves another operation with its associated morbidity and mortality;²⁶
3. In cases of diverticulitis, up to 1/3 of patients do not have reversal of the ostomy.²⁶

Prior to performing a primary anastomosis, several factors should be considered before it is deemed safe. As summarised in guidelines by the association of Coloproctology of Great Britain and Ireland there are several risk factors associated with increased risk of anastomotic leak. Known preoperative considerations that placed our patient at a greater risk included male gender, age >60 and emergency surgery. There were no identifiable intraoperative considerations that placed our patient at increased risk as the operation time was <4 hours with very minimal contamination while our patient remained haemodynamically stable throughout. The anastomosis was fashioned without tension and there was good vascularity noted.

Our patient had viable bowel and it was decided to perform a subtotal colectomy and ileorectal anastomosis to decrease the risk of recurrence which would mean a second operation in an elderly man with multiple comorbidities. The decision to perform an anastomosis was made due to low intraoperative risk factors for an anastomotic leak and to spare the patient the additional morbidity of having to manage an ostomy in a setting of poor social support. This decision, however, resulted in the complication of an enterocutaneous fistula secondary to anastomotic break down. Definitive surgical management was chosen over conservative management of this enterocutaneous fistula due to the presence of peritonism on examination.

Ultimately, the treatment lies with the managing surgical team after considering of all factors in order to achieve the best outcome for the patient.

Learning points

- ▶ Synchronous volvulus of the sigmoid colon and caecum is a rare cause of large bowel obstruction.
- ▶ Classic radiological appearances of each volvulus may not be appreciated as one may distort the other due to mass effect.
- ▶ Early surgical intervention is necessary to decrease morbidity and mortality.

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Patient consent Obtained.

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