CASE REPORT

Rectal volvulus following laparoscopic left hemicolectomy

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SUMMARY

A 60-year-old lady with a history of Dukes B2 (T3N0M0) colorectal cancer presented some 2 years following a laparoscopic left hemicolectomy with a 4-day history of absolute constipation. A plain radiograph demonstrated large bowel obstruction, and subsequent CT of the abdomen showed the level of the obstruction to be at the rectum. Initially the aetiology was believed to be recurrence at the site of the anastomosis; however, subsequent review of the imaging and indeed endoscopic examination of the rectum showed it to be volvulus. This was initially treated with endoscopic decompression and later by the insertion of a flatus tube to good effect. The patient was discharged 3 days later with no recurrence of her symptoms at 2 months.

BACKGROUND

Large bowel obstruction is a common presentation to the acute surgical take, with malignancy being a potential cause both in those already known to have had the disease as well as it being the first presentation. We increasingly rely on the use of CT scan to demonstrate the aetiology of the obstruction and infer management decisions.

Volvulus of the large bowel is common at the caecum as well as the sigmoid colon. In this patient who had had a previous left hemicolectomy for malignancy, the natural lie of the colon within the abdominal cavity had changed. Medialisation of the colon as part of this procedure predisposed her to a volvulus at an unusual site, which initially caused some diagnostic uncertainty. Knowledge of this will assist clinicians (both surgeons and radiologists) to identify this phenomenon and offer prompt and appropriate treatment.

CASE PRESENTATION

A 60-year-old lady with a history of Dukes B colorectal cancer presented some 2 years following a laparoscopic left hemicolectomy with a 4-day history of absolute constipation. In the preceding month she had visited her general practitioner complaining of intermittent diarrhoea and the passage of some mucous per rectum. Her weight was stable although she did complain of anorexia for almost 6 months. Routine blood tests and stool cultures had been performed which were unremarkable. Following discussion with the colorectal nurse specialist she was awaiting a colonoscopy, however the deterioration in her clinical symptoms warranted emergency admission prior to the scheduled investigation.

Her significant medical history included a Dukes B2 (T3N0M0) tumour of the descending colon which was treated with laparoscopic left hemicolectomy with resection down to the rectosigmoid junction. No adjuvant therapy was received. She had attended regular follow-up as per local departmental guidelines, each visit documenting her favourable progress with normal imaging, endoscopic examination of the colon and blood tests. There were never any reported symptoms of obstructive defecation.

INVESTIGATIONS

After admission a plain abdominal radiograph demonstrated predominantly large bowel distension with no obvious cut-off point seen (figure 1). Surgical clips were seen to correspond with the previous left hemicolectomy. Routine blood tests (including full blood count, urea and electrolytes, liver function tests and inflammatory markers) also performed at the time of admission were unremarkable.

CT scan of the abdomen and pelvis was later performed. The axial CT images through the pelvis demonstrated several dilated loops of the large bowel with an abrupt cut-off at the level of the mid-rectum in keeping with mechanical large bowel obstruction. This was originally thought to represent stricturing at the anastomosis, however after further review of the images a twist/swirling

Figure 1 Plain abdominal radiograph demonstrating predominantly large bowel distension with no obvious cut-off point. Surgical clips are seen which correspond to the previous left hemicolectomy.

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Figure 2 Axial CT images through the pelvis demonstrating several dilated loops (small arrows) of the large bowel with an abrupt cut-off (large arrow) at the level of the mid-rectum in keeping with mechanical large bowel obstruction.

pattern was seen at the level of the abrupt cut-off in the rectum indicating a volvulus at this site (figures 2–6).

DIFFERENTIAL DIAGNOSIS

Absolute constipation is the hallmark symptom of bowel obstruction, and is normally associated with abdominal pain and, in the case of small bowel obstruction at least, bilious vomiting. The commonest causes of obstruction of the small bowel are adhesions and herniae. The commonest causes of mechanical large bowel obstruction are malignancy and volvulus.

This lady's CT scan reported large bowel obstruction. In this setting, potential causes would include recurrence (potentially at the site of the previous anastomosis), volvulus or pseudo-obstruction. Primary pseudo-obstruction may be caused

Figure 4 Coronal image of the abdomen and pelvis demonstrating a twist/swirling pattern to the bowel at the level of the rectum consistent with a volvulus at this site (arrow). Abrupt change in calibre can again be seen on this image.

by injury to the smooth muscle (myopathic) or nervous system (neuropathic) of the gastrointestinal tract. Alternatively pseudo-obstruction can occur secondarily to a number of diseases such as Parkinson's disease or collagen vascular disorders, endocrine and electrolyte abnormalities or drugs, most commonly opiates.

The initial report from this lady's CT scan suggested recurrence at the site of her anastomosis to be the cause of the obstruction; however, subsequent review highlighted the swirling pattern previously described, raising the suspicion of a volvulus at an unconventional site.

Figure 3 Coronal image of the abdomen and pelvis demonstrating a twist/swirling pattern to the bowel at the level of the rectum consistent with a volvulus at this site (arrow). Abrupt change in calibre can again be seen on this image.

Figure 5 Coronal image of the abdomen and pelvis demonstrating a twist/swirling pattern to the bowel at the level of the rectum consistent with a volvulus at this site (arrow). Abrupt change in calibre can again be seen on this image.

Figure 6 Coronal image of the abdomen and pelvis demonstrating a twist/ swirling pattern to the bowel at the level of the rectum consistent with a volvulus at this site (lower arrow). Abrupt change in calibre can again be seen on this image. A dilated rectum can also be seen proximally (upper arrow).

TREATMENT

The patient initially underwent flexible sigmoidoscopy, with endoscopic findings consistent with a volvulus at the upper part of the rectum, approximately 20 cm from the anal verge. The sigmoidoscope was passed through the volvulus to normal looking colon, with the remainder of the examination being unremarkable.

While the patient did experience some initial symptomatic improvement, it was clear over the subsequent 24 h that the obstruction had not resolved. A rigid sigmoidoscopy was performed and a flatus tube inserted with immediate decompression.

OUTCOME AND FOLLOW-UP

Following the insertion of the flatus tube via rigid sigmoidoscopy, the patient's symptoms promptly resolved. The flatus tube was withdrawn 48 h later and the patient discharged home the next day. On review at 2 months the patient remained well and asymptomatic, and no further investigations or treatment have been arranged.

Given this was the first presentation of volvulus, we feel that expectant management is appropriate. Should the patient re-present with recurrent symptoms this would pose some difficult treatment decisions; however, these would need to be based upon the clinical presentation and accompanying radiology. Frequent re-presentation may be an indication for surgical intervention.

DISCUSSION

The term volvulus derives from the Latin verb *volvare*—to wrap up in coils.¹ Volvulus describes a condition in which the bowel becomes rotated on its mesenteric axis resulting in complete or partial obstruction.²

The sigmoid colon is the most frequent site of colonic volvulus, accounting for about 60–75%. Other sites include caecum (22–34.5%), transverse colon (2–3.6%) and splenic flexure

(1%).^{2–4} Sigmoid volvulus is the third leading cause of colon obstruction in adults.^{5 6}

Sigmoid volvulus is seen classically in elderly, institutionalised patients who suffer from chronic constipation.^{3 4} However, it is thought to be an idiopathic condition, with the main predisposing factor being an anatomical variant, that is, redundant sigmoid colon with a narrow mesenteric attachment.^{3 5} Secondary causes have been attributed to high-fibre and vegetable diets, certain neurological diseases, congenital megacolon and Chagas' disease.^{5 6}

Initial management include fluid resuscitation, nasogastric suction and analgesia.^{3 7} Conservative management involves using a flatus tube and/or sigmoidoscope decompression in uncomplicated patients.^{3 7} If these fail or evidence of gangrenous bowel, then emergency laparotomy is required.² With successful untwisting, the definitive and standard therapy for sigmoid volvulus is an elective surgery for sigmoid resection and primary anastomosis to prevent recurrence.^{2 6}

There are also volvuli that involves non-colonic viscera. Small bowel volvulus is a rare but potentially fatal surgical emergency.^{8 9} This carries an overall death rate of 10–35% with mortality increasing to 40% or greater in the presence of gangrene.¹⁰ There seems to be a male predisposition of 2:1, and its peak incidence is in the sixth to eighth decade.⁸ Primary small bowel volvulus is uncommon, but usually secondary to conditions such as congenital bands, postoperative adhesions, internal hernias, diverticulum and tumour.^{8 11} Abdominal CT is important in establishing diagnosis and early operative intervention is the mainstay of treatment to preclude intestinal necrosis.^{8 10}

Gastric volvulus is another uncommon condition but is a diagnostic emergency and therapeutic challenge due to the high risk of ischaemia and perforation associated with it.^{12 13} Spontaneous volvulus is rare because the stomach is usually well tethered by its attachments to the oesophagus and duodenum, by the left gastric artery and to the greater omentum. Common causes thus include ligament laxity, hiatal hernia, bands and adhesions.^{12 14} Borchardt's triad consisting of unproductive retching, severe epigastric pain and inability to pass a nasogastric tube is suggestive of acute gastric volvulus.^{15 16} Diagnosis could be made through barium swallow, but mainly confirmed with a CT scan.^{12 15 16} Treatment comprises reduction, repair of the diaphragmatic defect if present, gastropexy and gastric resection in cases of gastric necrosis.^{12 14}

The caecum is the second most common site of colonic volvulus and accounts for about 22–34.5% of cases.^{17–19} Caecal volvulus usually occurs with an axial twist that involves the caecum, ascending colon and terminal ileum.^{17 18} A caecal bascule is a variant of this condition and is associated with the upward and anterior folding of the ascending colon, thus creating obstruction at the site of the transverse fold. This in present in approximately 10% of all caecal volvulus cases.^{17 18} Precipitating factors are similar to those of sigmoid volvulus and include previous surgery, congenital bands, malrotation and distal colonic obstruction. Pregnancy, adynamic ileus and chronic constipation have also been implicated.^{17–19} There is a slight female preponderance (1.4–2:1) and can occur at all ages but more frequently above the age of 50.^{19 20} Diagnosis based on clinical findings and plain abdominal radiographs was made in 50% of cases,^{21 22} but mainly confirmed through the use of barium enema and CT evaluations.^{17 18} Surgical options include manual detorsion, caecopexy and caecostomy for non-complicated cases and right hemicolectomy in the presence of gangrene or perforation.^{17 20 22}

Volvulus of the transverse colon is a rare entity and represents about 2–3.6% of all colonic volvulus,^{23 24} but carries a relatively high death rate (33%).^{23 24} Aetiology of this condition may be multifactorial but could be loosely grouped into mechanical, physiological and congenital causes or in combination.^{24 25} Clinical features are indistinguishable from other causes of colonic volvulus but there are no classically recognisable radiographic features as sigmoid and caecal volvulus.^{25 26} Contrast-enhanced plain film is the gold standard of diagnosis.^{25 26} The best treatment is surgical, where resection with or without primary anastomosis is the operation of choice to prevent recurrence.²⁵

Splenic flexure volvulus is the least common site of colonic volvulus (1–2%) with associated low death rates.^{27 28} This has been attributed to the rarity of gangrenous colon from this type of volvulus.²⁸ The procedure of choice would be surgical resection of the volvulus segment with or without primary anastomosis.^{29 30}

All these various types of volvuli, although different in terms of their respective locations in the alimentary system have very similar clinical presentations, investigation modalities and surgical approaches. While rectal volvulus has not been reported in the literature, conventional treatment as per any other gastrointestinal volvulus has proven favourable.

Learning points

- Medialisation of the colon during left hemicolectomy may predispose individuals to volvulus at the level of the rectum.
- Interpretation of cross-sectional imaging in situations such as this can be challenging, and clinicians should be open-minded as to the aetiology of large bowel obstruction.
- Endoscopic examination of the rectum is a useful investigation where the cause of obstruction remains unclear.
- For treatment of volvulus within the rectum, a flatus tube may prove useful.

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