CASE REPORT

Very rare case of synchronous volvulus of the sigmoid colon and caecum causing large-bowel obstruction

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SUMMARY

Large-bowel obstruction caused by volvulus is potentially life threatening if not managed promptly. Sigmoid colon is the most common site of volvulus followed by caecum. Synchronous double colonic volvulus is an exceedingly rare entity, with only five cases published previously. We present the case of a 77-year-old man with a synchronous sigmoid and caecal volvulus. He underwent total colectomy with ileostomy formation with a view to reverse the ileostomy at a later date.

BACKGROUND

- ▶ Extremely rare case—first ever reported case in Australia. Only five cases previously reported globally.
- ▶ Due to nature of presentation and radiological features, one volvulus can be easily missed as its features are masked by the other.
- ▶ If not managed early with adequate resuscitation and prompt surgery, can be fatal for the patient quickly.

CASE PRESENTATION

Synchronous or simultaneously occurring sigmoid and caecal volvulus is an extremely rare phenomenon. Literature search revealed only five previously documented cases globally.^{1–6} To our knowledge, this is the first documented case in Australia of such case.

A 77-year-old man presented to our hospital emergency department, with a 3-day history of sudden-onset generalised abdominal pain, constipation and abdominal distension. He reported nausea but denied any vomiting during this period. He also reported anorexia for 1 day prior to presentation. The patient also reported that this was his first episode of an abdominal discomfort of this nature. He denied any recent change in bowel habits or per-rectal bleeding. He had no family history of any colorectal cancers.

His medical history included endovascular aortic repair and lung cancer treated with definitive chemoradiotherapy. He had intermittent constipation for which he took macrogol occasionally. He was disease free and otherwise lived a healthy life at home, independent with his activities of daily living.

Physical examination revealed a hugely distended abdomen with mild tenderness. No masses or hernias were palpable. Bowel sounds were present.

Digital rectal examination revealed an empty rectum with no masses or blood on examining finger. All his vital signs were within normal limits.

INVESTIGATIONS

Bloods

On presentation, all his blood tests including electrolytes and renal function tests were within normal limits. Blood gas analysis did not show any metabolic acidosis changes.

Radiographs

Erect abdominal radiographs ([figure 1](#)) showed significant dilatation of the sigmoid but the descending colon was not significantly enlarged. The amount of faeces within the abdomen was limited. No free gas was seen under the diaphragm. There was an elevation of the left hemidiaphragm. Radiographic impression was consistent with a sigmoid volvulus.

DIFFERENTIAL DIAGNOSIS

Sigmoid volvulus.

TREATMENT

As the patient did not demonstrate any signs of bowel ischaemia, decision was made to attempt decompression and then proceed to definitive surgery at a later date.

Sigmoid volvulus was distorted and decompressed with a flexible sigmoidoscopy followed by the insertion of rectal tube. His left colon was fully decompressed at the end of procedure.

Flexible sigmoidoscopy was performed as his bowel was unprepped and he was found to have redundant colon.

Unfortunately, he had recurrent volvulus shortly after the removal of rectal tube, confirmed by repeat abdominal X-ray.

Decision was then made to proceed with operative management, the plan was to decompress the left colon colonoscopically followed by anterior resection. Following detorsion of the 180° clockwise sigmoid volvulus, anterior resection was performed. However, the right colon was also noted to be hugely distended at laparoscopy.

Further on-table colonoscopy to decompress the right colon was attempted but it was unsuccessful. The procedure was then converted to open laparotomy. Synchronous caecal volvulus was then noted at laparotomy showing a 180° anticlockwise volvulus ([figure 2](#)). The procedure was concluded with total colectomy and end ileostomy.

Total colectomy was performed instead of partial colectomy due to the fact that he had caecal and sigmoid volvulus ([figure 3](#)). Anastomosis was not

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Figure 1 Abdominal radiograph showing dilated large-bowel loops. Typical 'coffee bean' sign seen for sigmoid volvulus.

performed as he was on inotropic support after the prolonged procedure. Ileostomy was temporary for later restoration of continuity.

The ileostomy was not reversed as he passed away after active treatment was withdrawn given his advanced age and comorbidities.

OUTCOME AND FOLLOW-UP

The patient was kept for observation in intensive care unit (ICU) postoperatively. From a surgical point of view, the recovery was uneventful. Abdomen was soft on palpation with an active ileostomy from postoperative day 2.

However, the patient was kept in ICU for a prolonged period of 15 days postoperatively due to development of bilateral pleural effusion and lung consolidation.

He was subsequently discharged from ICU on day 22 postoperatively. However, he passed away from cardiorespiratory failure following discharge from ICU. Given his advanced age and other comorbidities, active treatment was withdrawn.

Thus, his ileostomy was not reversed.

Figure 2 Intraoperative picture of the caecal volvulus. Dilated loops of the large bowel can be seen. (Black arrow denotes the caecum.)

Figure 3 The whole colonic specimen showing both caecal and sigmoid volvulus.

DISCUSSION

The word 'volvulus' was derived from the Latin term 'volvere' which means to twist. It is an axial twist of a portion of the alimentary tract along its mesentery. Volvulus can occur in any portion of the alimentary tract including the stomach, gall bladder and small intestine, but most commonly in the colon.⁷ The caecum (10%–52%) and sigmoid colon (43%–71%) are the two most common sites of colonic volvulus.^{8–13} Sigmoid volvulus is more frequently seen in low/middle-income countries compared with Western countries. If not diagnosed and treated early, volvulus can rapidly progress to bowel ischaemia, necrosis and perforation, carrying a significant risk of morbidity and mortality.

A synchronous double volvulus of caecum and sigmoid is very rare. After carrying out an extensive literature search, we came across only five cases worldwide, ours being the fourth ever reported case published in English literature. Also, it is the first case reported in Australia/New Zealand.

Sigmoid volvulus is usually seen in older population, with a mean age of 70 years—who are mostly institutionalised and debilitated secondary to neurological or psychiatric diseases.¹³ Most of these patients have a history of long-standing constipation.^{14–17} In younger populations, including children, sigmoid volvulus has been reported in patients with abnormal colonic motility (notably Hirschsprung's disease and Chagas disease).^{18–23}

Caecal volvulus usually comprises rotation or torsion of a mobile caecum and ascending colon. Approximately 1%–3% of all large-bowel obstructions are caused by a caecal volvulus.^{24–26} Caecal volvulus is classified into three types—I, II and III. Type I and II are more common and caused by torsion and account for 80% of all cases while type III is caused by caecal bascules (upward folding of the caecum) and accounts for the remaining 20%.⁸

Among the published literature on epidemiology of patients with colonic volvulus, it was seen that sigmoid volvulus was more common in older adult males (>70 years), people of African descent, patients with diabetes mellitus and neuropsychiatric disorders. Caecal volvulus was observed to be more prevalent in younger women.¹³

A number of theories have been proposed to explain colonic torsion.

To name a few:

- A. Stretching and lengthening of mesentery from long-standing constipation.

- B. Surgical division or congenital anatomic anomalies (absence of the gastrophrenic, gastrosplenic and splenorenal ligaments).
- C. Presence of long mesentery and long redundant sigmoid colon.
- D. Colonic dysmotility.
- E. Partial intestinal malrotation.

All of these have been postulated to cause volvulus of the colon.¹

The presence of a long sigmoid mesentery with and mobile caecum was identified as the cause of synchronous volvulus of our case.

Diagnosis of colonic obstruction is made based on—thorough history, examination and radiological investigations.

The findings on physical examination are greatly variable. Patients who have bowel ischaemia or perforation would present with septic shock and peritonism, while others may have normal vital signs.

The abdomen is typically distended and tympanic on percussion. However, in some patients, the abdomen can be asymmetrically distended with tympany only present in the mid-abdomen or in the right or left upper quadrant.

In our patient, at the time of presentation, all vital signs were within normal limits. His abdominal examination did not show any signs of peritonism. His abdomen was distended but only mildly tender at the upper abdomen in the epigastric region.

Laboratory studies are not diagnostic of colonic volvulus. However, a significant leucocytosis or metabolic acidosis may indicate the presence of bowel compromise (ischaemia, necrosis or perforation). Hypokalaemia and other electrolyte abnormalities may develop after protracted vomiting associated with a bowel obstruction.

Plain radiographic images of volvulus will normally show features of large-bowel obstruction. The features of synchronous sigmoid and caecal volvulus can mask the radiological appearance of each other. Similarly, with CT imaging, the diagnosis may be missed due to mass effect of one volvulus on the other coupled with rarity of this condition.²⁷ Contrast enema can sometimes be useful for diagnostic purpose but carries with it a higher risk of perforation.

In this case, dilated large-bowel loops were seen on plain radiographic images. Typical 'coffee bean' sign suggesting volvulus of the sigmoid colon was apparent. However, the caecal volvulus was not evident and was probably masked by the sigmoid volvulus. As there were clear signs of large-bowel obstruction, we took the patient to the operating theatre without doing any CT or contrast studies.

Aim of treatment, as in any colonic obstruction, is to reduce the torsion and to prevent recurrent episodes. The usual approach in these cases consists of colonic decompression with a rectal tube or colonoscopy, and thereafter a definitive surgery. In patients with signs and symptoms suggestive of peritonitis or where endoscopic detorsion is unsuccessful, urgent laparotomy is indicated.

Surgical management of sigmoid volvulus alone includes sigmoid resection with primary anastomosis or a Hartmann's procedure.²⁸ The management for patients with a caecal volvulus is almost always surgical. Non-operative reduction of caecal volvulus (eg, by colonoscopy or contrast enema) is rarely successful (<5%) and could cause perforation. In addition, colonic necrosis may be missed in 20%–25% of patients who undergo non-operative reduction, and such patients may develop colonic perforation.^{13 19 26 29 30} Surgical approaches to caecal volvulus vary depending on intraoperative findings and

patient stability, typically right hemicolectomy with or without ileostomy.

In our patient, intraoperatively, the synchronous double volvulus was diagnosed due to the vigilance of the surgeon who noted distended caecum after completing the laparoscopic anterior resection. Colonoscopic decompression of the caecum was attempted but remained unsuccessful despite laparoscopic assistance. Caecal volvulus was only confirmed after laparotomy. Caecal volvulus in this case could be easily missed if the case was concluded after laparoscopic anterior resection.

Due to port placements addressing the preoperative diagnosis of sigmoid volvulus, the caecal volvulus was behind the camera and therefore out of the laparoscopic view. It was not identified as the large and distended sigmoid volvulus was occupying most of the abdominal cavity and distracted the surgeon's attention away from the right side of the abdominal cavity. It was suspected when the identification of terminal ileum was difficult and distended caecum was identified.

Laparotomy is not mandatory for each and every case of sigmoid volvulus, however, a surgeon has to remain vigilant to perform general laparoscopic inspection to exclude other uncommon coexisting pathology.

In patients without previous history of chronic volvulus, the key to management is timely treatment. Especially in old patients, symptoms like abdominal pain would not correlate with level of ischaemia.

Learning points

- Synchronous volvulus of the large bowel is a very rare entity which can be easily missed clinically.
- Radiologically, it is difficult to identify as features of one volvulus distorts the other.
- Early balanced resuscitation followed by prompt surgical intervention is the key to save the patient's life.

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Contributors All three of us were involved in the care of the patient from the time he attended emergency department. All of us were involved in the surgical procedure and postoperative care of the patient. All the authors were very closely related to drafting of the case report and subsequent modification. All correspondences should be directed to SPR.

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REFERENCES

- Lianos G, Ignatiadou E, Lianou E, et al. Simultaneous volvulus of the transverse and sigmoid colon: case report. *G Chir* 2012;33:324–6.
- Elsharif M, Basu I, Phillips D. A case of triple volvulus. *Ann R Coll Surg Engl* 2012;94:e62–e64.
- Singh G, Gupta SK, Gupta S. Simultaneous occurrence of sigmoid and cecal volvulus. *Dis Colon Rectum* 1985;28:115–6.
- Moore JH, Cintron JR, Duarte B, et al. Synchronous cecal and sigmoid volvulus. Report of a case. *Dis Colon Rectum* 1992;35:803–5.
- Berg AK, Perdawood SK. [Synchronous sigmoideum- and caecum volvulus]. *Ugeskr Laeger* 2015;177:V04150346.
- Islam S, Hosein D, Bheem V, et al. Synchronous volvulus of the sigmoid colon and caecum, a very rare cause of large bowel obstruction. *BMJ Case Rep* 2016. doi: 10.1136/bcr-2016-217116. [Epub ahead of print].

- 7 Peterson CM, Anderson JS, Hara AK, *et al.* Volvulus of the gastrointestinal tract: appearances at multimodality imaging. *Radiographics* 2009;29:1281–93.
- 8 Delabrousse E, Sarliève P, Saille N, *et al.* Cecal volvulus: CT findings and correlation with pathophysiology. *Emerg Radiol* 2007;14:411–5.
- 9 Abita T, Lachachi F, Durand-Fontanier S, *et al.* [Cecal volvulus]. *J Chir* 2005;142:220.
- 10 Ballantyne GH, Brandner MD, Beart RW, *et al.* Volvulus of the colon. Incidence and mortality. *Ann Surg* 1985;202:83.
- 11 Hiltunen KM, Syrjä H, Matikainen M. Colonic volvulus. Diagnosis and results of treatment in 82 patients. *Eur J Surg* 1992;158:607.
- 12 Gingold D, Murrell Z. Management of colonic volvulus. *Clin Colon Rectal Surg* 2012;25:236–44.
- 13 Halabi WJ, Jafari MD, Kang CY, *et al.* Colonic volvulus in the United States: trends, outcomes, and predictors of mortality. *Ann Surg* 2014;259:293.
- 14 Rosenthal MJ, Marshall CE. Sigmoid volvulus in association with parkinsonism. Report of four cases. *J Am Geriatr Soc* 1987;35:683–4.
- 15 Mangiante EC, Croce MA, Fabian TC, *et al.* Sigmoid volvulus. A four-decade experience. *Am Surg* 1989;55:41.
- 16 Baker DM, Wardrop PJ, Burrell H, *et al.* The management of acute sigmoid volvulus in Nottingham. *J R Coll Surg Edinb* 1994;39:304.
- 17 Oren D, Atamanalp SS, Aydinli B, *et al.* An algorithm for the management of sigmoid colon volvulus and the safety of primary resection: experience with 827 cases. *Dis Colon Rectum* 2007;50:489–97.
- 18 Krupsky S, Halevy A, Orda R. Sigmoid volvulus in adolescence. *J Clin Gastroenterol* 1987;9:467–9.
- 19 Mellor MF, Drake DG. Colonic volvulus in children: value of barium enema for diagnosis and treatment in 14 children. *AJR Am J Roentgenol* 1994;162:1157–9.
- 20 Sroujeh AS, Farah GR, Jabaiti SK, *et al.* Volvulus of the sigmoid colon in Jordan. *Dis Colon Rectum* 1992;35:64–8.
- 21 Atamanalp SS, Yildiran MI, Başoğlu M, *et al.* Sigmoid colon volvulus in children: review of 19 cases. *Pediatr Surg Int* 2004;20:492–5.
- 22 Ton MN, Ruzal-Shapiro C, Stolar C, *et al.* Recurrent sigmoid volvulus in a sixteen-year-old boy: case report and review of the literature. *J Pediatr Surg* 2004;39:1434–6.
- 23 Northeast AD, Dennison AR, Lee EG. Sigmoid volvulus: new thoughts on the epidemiology. *Dis Colon Rectum* 1984;27:260.
- 24 Baldarelli M, De Sanctis A, Sarnari J, *et al.* Laparoscopic cecopexy for cecal volvulus after laparoscopy. Case report and a review of the literature. *Minerva Chir* 2007;62:201.
- 25 Rakinic J. Colonic volvulus. In: Beck DE, Roberts PL, Saclarides TJ, eds. *The ASCRS textbook of colon and rectal surgery*. 2nd edn. New York: Springer, 2011:395.
- 26 Lee SY, Bhaduri M. Cecal volvulus. *CMAJ* 2013;185:684.
- 27 Islam S, Hosein D, Harnarayan P, *et al.* Synchronic volvulus of splenic flexure and caecum: a very rare cause of large bowel obstruction. *BMJ Case Rep* 2016;2016:bcr2015213029.
- 28 Peoples JB, McCafferty JC, Scher KS. Operative therapy for sigmoid volvulus. Identification of risk factors affecting outcome. *Dis Colon Rectum* 1990;33:643.
- 29 Madiba TE, Thomson SR. The management of cecal volvulus. *Dis Colon Rectum* 2002;45:264–7.
- 30 Schwab FJ, Glick SN, Teplick SK. Reduction of cecal volvulus by multiple barium enemas. *Gastrointest Radiol* 1985;10:185–7.

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