



Case Report

Enterolith from Small Bowel Diverticulum as an Uncommon Cause of Acute Small Bowel Obstruction and Literature Review

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Abstract

Small bowel diverticula, though rare, can cause serious complications requiring surgical interventions. We report a case of a 73-year-old male presented with a mechanical small bowel obstruction secondary to enterolith from a small bowel diverticulum. The patient underwent a diagnostic laparoscopy and enterotomy with removal of dislodged enterolith in the setting of small bowel diverticular disease.

Introduction

Small bowel or jejunoileal diverticular disease is a rare condition and was first report in 1807 by Sir Asley Cooper. It is commonly seen in an elderly population [1] and the exact aetiology is still unknown. Symptoms of small bowel diverticular disease can be vague and could result in diagnostic challenge. Complications that arise from small bowel diverticular disease such as chronic abdominal pain, malabsorption from bacterial overgrowth, bleeding, diverticulitis, perforation or primary enterolith formation causing small bowel obstruction [2] as demonstrated in our case. We detail this case to serve as a reminder to clinicians as a rare, yet important differential diagnosis for patients who presents with a small bowel obstruction.

Case History

A 73-year-old man presented to hospital with clinical evidence of a partial small bowel obstruction with intermittent passing of flatus. Significant past history included a prior laparoscopic cholecystectomy. Abdominal and pelvic Computed Tomography

(CT) scan demonstrated dilated loops of small bowel consistent with a transition point in the distal ileum. At the transition point, there was a 37 x 20mm intraluminal mass (Figures 1,2), thought to be an ingested foreign body, causing a mechanical obstruction. A gallstone ileus was excluded based on the patient's history and given the past history of abdominal surgery a gastrograffin follow through was then performed to confirm a mechanical obstruction. Diagnostic laparoscopy revealed an enterolith causing small bowel obstruction in the distal ileum with proximal bowel dilatation and mild faecalization. Proximal to this were multiple large jejunal diverticula without palpable masses in situ. It was presumed that the enterolith was formed in one of the diverticula and migrated distally where it became obstructed. The small bowel was delivered via a small midline incision. An enterotomy was made (Figure 3), the enterolith (Figure 4) was removed and after excluding mucosal ulceration due to friction with the enterolith, the enterotomy was closed in a Heineke-Mikulicz fashion [3]. The rest of the small bowel was palpated and no other palpable masses were identified. The patient's post-operative course was uneventful and he made a full recovery.



Figure 1: Axial view of CT Abdomen showing intraluminal mass causing mechanical small bowel obstruction

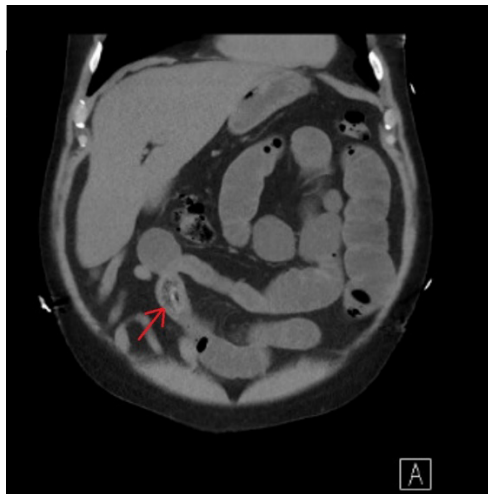


Figure 2: Coronal view of CT abdomen showing intraluminal mass causing mechanical small bowel obstruction

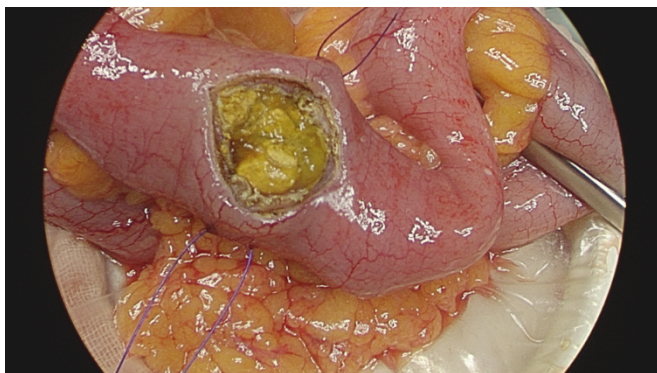


Figure 3: Enterotomy made showing the enterolith causing SBO.

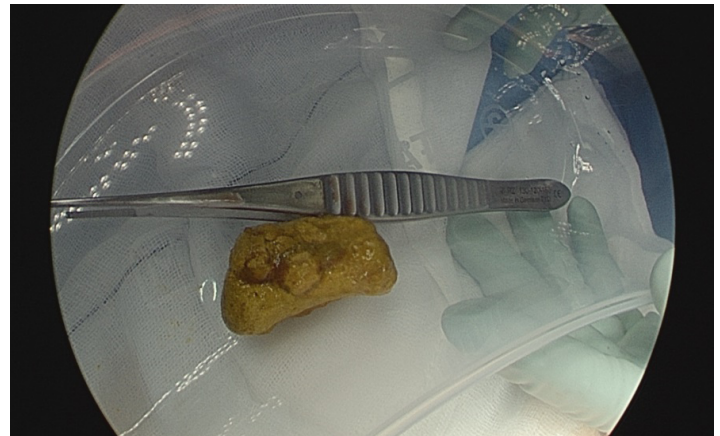


Figure 4: Enterolith removed from the small bowel.

Outcome and Follow Up

The patient was followed up by the surgical team. There were no complications related to the surgery, nor any other symptoms related to the small bowel diverticula.

Discussion

Small bowel diverticulosis is false diverticula and is an acquired condition [4]. This is as oppose to true diverticular disease, Meckel's diverticulum which is a congenital condition of the gastrointestinal system [5]. It originates from vitelline duct that fails to obliterate completely [5]. Non-Meckel's small bowel diverticulosis has only mucosa and submucosa layers formed by increased intraluminal pressure and are located on the mesenteric side of the small bowel [6]. Small bowel diverticula are usually asymptomatic and difficult to diagnose. The reported incidence of jejunoileal diverticula is shown to be over 7% but is thought to be likely underestimated [4,7]. The incidence of enterolithiasis in this setting is thought to be less but is difficult to quantify exactly [8]. Often the small bowel diverticulosis is incidentally found on imaging or during exploratory laparoscopy or laparotomy [4]. Small bowel diverticulosis predisposes enterolith formation due to altered luminal propagation and peristaltic function causing stasis as well as changed luminal pH and bacterial overgrowth [8]. This results in deconjugating bile salts which precipitate into a stone forming enterolith [8]. Enteroliths may be composed of food particles with chemical foreign material or from cholerac acid [8].

Patients with jejunoileal diverticulosis may have non-specific symptoms such as chronic abdominal pain, nausea, vomiting [7]. They may also experience altered bowel habits such as diarrhoea or constipation, weight loss or malabsorption [4]. Jejunoileal diverticulosis, can lead to serious complications such

as diverticulitis, haemorrhage, abscess formation, perforation and bowel obstruction [1,4]. Perforation is one of fatal complications of small bowel diverticula with high mortality rate if untreated [9]. Mansour et al. reported the incidence of perforation as 2.1-7% [9]. It can be caused by direct erosion of enterolith of the diverticulum or by mural necrosis in bowel dilatation from obstruction [10] and usually is managed with surgery of the affected region [2, 11]. As previously reported, excision of single diverticulum carries high complication risk hence segmental resection is recommended [2]. However, long term data regarding complications from remaining small bowel diverticulosis post resection has not been studied before. There is also a limited data on how long it will take for enterolith to form or solidify hence it is difficult to estimate the risk of another complication arising even post resection. On the basis of this, we do not advocate prophylactic resection, or imbrication of small bowel diverticula as an incidental finding during a laparotomy, though palpation of the small bowel may be of benefit.

Mechanical obstruction by enteroliths, which are dislodged from the small bowel diverticulum, is a rare complication of the small bowel diverticulum. More common aetiology of acute luminal obstruction in case of small bowel diverticulum is adhesional or inflammatory stenosis from recurrent diverticulitis [7]. Other reported causes include shear pressure of the diverticulum onto the small bowel, intussusception or volvulus [7,12]. In our case, gallstone ileus, which accounts for less than 5% of mechanical small bowel obstruction [13], was excluded however; we did not completely exclude the adhesional cause of small bowel obstruction given the patient's history of laparoscopic cholecystectomy. One multicentre, retrospective study showed that the prevalence of adhesional small bowel obstruction with history of previous cholecystectomy was 0.11% [14]. Investigations such as abdominal x-ray or CT scan can guide in making diagnosis and management. Traditionally abdominal x-ray was used as a first-line to identify enteroliths especially calcium salts [15]. Nowadays, CT abdomen is readily available and used to identify the presence of enteroliths, their locations, underlying pathology as well as any complications [15]. Many studies have used CT abdomen on presentations which aided in making diagnosis early [10,16-23]. One case study [13] used a barium meal follow-through in their month follow-up to ensure no further obstruction or fistula was present.

Surgical interventions are often required in serious complications of small bowel diverticulosis. As demonstrated in our case, the bowel obstruction was managed by diagnostic laparoscopy, enterotomy and removal of the enterolith. Careful and thorough intraoperative examination was performed by palpating the small bowel diverticular to ensure there was no more enterolith that could potentially cause complications. The less invasive approach in managing enteroliths is crushing and milking the stone passed ileocaecal valve [13,24], however this

will not address the potentially compromised bowel due to the impacted stone. Enterotomy is performed to deliver enterolith or furthermore, segment of small bowel may require to be resected in more serious cases [25]. The decision making during the operation can be challenging given there may be multiple diverticular present and not all can be resected. This is more challenging in cases of uncomplicated small bowel diverticulum where patients have vague symptoms such as nonspecific abdominal pain with no clear diagnosis [7].

Conclusion

Clinicians need to be aware that the patients with a prolonged history of small bowel diverticulosis can present with small bowel obstruction. Small bowel diverticulum and its complications also can present with vague symptoms hence can lead to diagnostic challenges. Serious complications can lead to significant morbidity and mortality hence early diagnosis is crucial to deliver an appropriate management for these patients as they often require surgical interventions.

References

1. Fintelmann F, Levine MS, Rubesin SE (2008) Jejunal diverticulosis: findings on CT in 28 patients. *American Journal of roentgenology* 190: 1286-1290.
2. Mathangasinghe Y, Samaranayake UMJE, Jayasinghe JD, Banagala ASK (2019) A Rare Presentation of Small Bowel Diverticulosis Causing Chronic Obstruction and Malnutrition: A Case Study with Review of Literature. *Case Reports in Surgery* 2019: 5.
3. Lee EC, Papaionnous N (1982) Minimal surgery for chronic obstruction in patients with extensive or universal Crohn's disease. *Annals of the Royal College of Surgeons of England* 64: 229-233.
4. Pak A, DeMuro JP, Botros DG, Bohrer SL (2011) A Case of Obstruction Due to Jejunoileal Diverticula. *Journal of Gastrointestinal Surgery* 15: 2108-2110.
5. Malik AA, Bari S, Wani KA, Khaja AR (2010) Meckel's Diverticulum - Revisited. *The Saudi Journal of Gastroenterology* 16: 3-7.
6. Lempinen M, Salmela K, Kemppainen E (2004) Jejunal diverticulosis: a potentially dangerous entity. *Scandinavian Journal of Gastroenterology* 39: 905-909.
7. Singh O, Gupta SS, Shukla S, Mathur RK, Shukla S (2009) Jejunal diverticulae: reports of two cases with review of literature. *Indian Journal of Surgery* 71: 238-244.
8. Gurvits GE, Lan G (2014) Enterolithiasis. *World Journal of Gastroenterology* 20: 17819-17829.
9. Mansour M, Abboud Y, Bilal R, Seilin N, Alsuliman T, et al. (2022) Small bowel diverticula in elderly patients: a case report and review article. *BMC Surgery* 22: 101.
10. Chaudhery B, Newman PA, Kelly MD (2014) Small bowel obstruction and perforation secondary to primary enterolithiasis in a patient with jejunal diverticulosis. *BMJ Case Reports* 2014: 1-4.

11. Tsiotos GG, Farnell MB, Ilstrup DM (1994) "Nonmeckelian jejunal or ileal diverticulosis: an analysis of 112 cases," *Surgery* 116: 726-731.
12. Balducci G, Dente M, Cosenza G, Mercantini P, Salvi PF (2008) Multiple giant diverticula of the foregut causing upper gastrointestinal obstruction. *World Journal of Gastroenterology* 14: 3259-3261.
13. Sharma O, Mallik D, Ranjan S, Sherwani P, Kumar N, et al. (2022) Enterolith Causing Small Bowel Obstruction: Report of a Case and Review of Literature. *Clinical and Experimental Gastroenterology* 15: 101-104.
14. Duron JJ, Hay JM, Msika S, Gaschard D, Domergue J, et al. (2000) Prevalence and Mechanisms of Small Intestinal Obstruction Following Laparoscopic Abdominal Surgery A Retrospective Multicentre Study. *The Archives of Surgery* 135: 208-212.
15. Jadib A, Tabakh H, El Ouazzani LC, Boumlik K, Boutachali R, et al. (2022) Primary true enterolithiasis: A rare cause of acute small bowel obstruction. *Radiology Case Reports* 17: 610-614.
16. Fourneau H, Coulier B, Rezazadeh AA (2018) Small Bowel Obstruction Due to Enterolith in a Patient with Diffuse Jejuno-Ileal Diverticulosis. *Journal of the Belgian Society of Radiology* 102: 10.
17. Kornprat P, Langner C, Mischinger HJ (2006) Enterolith Small-Bowel Obstruction Caused by Jejunal Diverticulosis: Report of a Case. *Wiener klinische Wochenschrift* 117: 297-299.
18. Efremidou EI, Liratzopoulos N, Papageorgiou MS, Kouklakis G, Minopoulos GJ, et al. (2006) Enterolith Small-Bowel Obstruction Caused by Jejunal Diverticulosis: Report of a Case. *Surgery Today* 36: 1003-1006.
19. Crace PP, Grisham A, Kerlakian G (2007) Jejunal Diverticular Disease with Unborn Enterolith Presenting as a Small Bowel Obstruction: A Case Report 73: 703-705.
20. Patel VA, Jefferis H, Spiegelberg B, Iqbal Q, Prabhudesai Q, et al. (2008) Jejunal diverticulosis is not always a silent spectator: A report of 4 cases and review of the literature. *World Journal of Gastroenterology* 14: 5916-5919.
21. Nijhof HW, Bisselink J, Rijbroek A (2009) Small bowel obstruction due to enterolith expelled from duodenal diverticulum. *ANZ Journal of Surgery* 79: 77-78.
22. Quinn T, Strauss P (2013) Faecolith arising from jejunal diverticulosis: an unusual cause of small bowel obstruction in the virgin abdomen. *ANZ Journal of Surgery* 84: 689-691.
23. Gachbayov M, Orujova L, Kubachev K (2018) Traction Diverticulum of the Small Bowel with Enterolith as a Cause of Intestinal Obstruction. *Clinical Medicine & Research* 16: 92-94.
24. Leow CK, Lau WY (1997) Treatment of small bowel obstruction by jejunal enterolith. *Surgery* 122: 977-978.
25. Shah SR, Bhaduri A, Desai DC, Abraham P, Joshi A (2003) Obstructing enterolith as presenting feature in Crohn's disease. *Indian Journal of Gastroenterology* 22: 24.