



MULTIPLE SMALL INTESTINAL DIVERTICULOSIS WITH ENTEROLITH PRESENTING AS INTESTINAL OBSTRUCTION AND INCIDENTAL ILEAL LEIOMYOMA – A RARE CASE

General Surgery

Srikanth M*	Final Year Post-graduate student, Kalinga Institute of Medical Sciences, Bhubaneswar (Odisha) *Corresponding Author
Sudhir Kumar Panigrahi	Professor of Surgery, Kalinga Institute of Medical Sciences, Bhubaneswar (Odisha)
ASJ Swaroop	Final Year Post-graduate student, Kalinga Institute of Medical Sciences, Bhubaneswar (Odisha)
Rajat Kumar Patra	Assistant Professor of Surgery, Kalinga Institute of Medical Sciences, Bhubaneswar (Odisha)
Pran Singh Pujari	Professor & HOD of Surgery, Kalinga Institute of Medical Sciences, Bhubaneswar (Odisha)

ABSTRACT

Small intestinal diverticulosis is a relatively rare clinical entity, commonly occurring as acquired false diverticula. About 95% of the cases are asymptomatic and the rest becomes symptomatic due to the complications like diverticulitis, hemorrhage, obstruction, fistula formation and perforation. The diagnosis in most of the cases is by exclusion. It is usually diagnosed incidentally at laparotomy or laparoscopy or enteroclysis studies conducted for one of its complications as the presenting condition. The vague nature of presentation added with lack of a gold standard investigation modality, makes the diagnosis of small bowel diverticulosis difficult. Here, we present a rare case of multiple small intestinal diverticulosis presenting along with intestinal obstruction due to enterolith in the adjacent small bowel.

KEYWORDS

Small intestinal diverticulosis, intestinal obstruction, enterolith

INTRODUCTION

Small intestinal diverticulosis is a relatively uncommon clinical entity, with a prevalence of 0.06% - 2.3% on autopsy findings¹ and 0.1% - 1.5% in upper GI studies. They are typically acquired, false diverticula except for Meckel's diverticulum of distal ileum, and consist of herniated mucosa and submucosa through a point of weakness in the muscularis propria. Duodenal diverticula are the most common acquired small bowel diverticula followed by jejunoleal diverticula. About 95% cases are asymptomatic and the rest 5% present with non specific symptoms such as nausea, vomiting, recurrent crampy upper abdominal pain, post prandial bloating resulting from the complications of diverticula, sometimes associated with malabsorption, steatorrhoea and vitamin B12 deficiency leading to megaloblastic anaemia. An enterolith is a mineral concretion formed around a nidus in the gastrointestinal tract, either formed de novo or secondary to a piece of undigested food, composed of choleic acid as its primary constituent formed as a result of acidic pH shift within the diverticula and rarely, calcium phosphate and calcium carbonate.

The vague and diverse nature of symptoms added with lack of a gold standard diagnostic modality have made the diagnosis of small bowel diverticula a challenging one and has been a diagnosis by exclusion till date. It is detected incidentally at laparotomy or laparoscopy or enteroclysis studies conducted for one of its complications such as diverticulitis; hemorrhage; fistula formation; intestinal obstruction due to adhesions, intussusception, volvulus, extrinsic compression from a fluid filled diverticulum or rarely enteroliths, and perforation as the presenting condition. The delay in the diagnosis and management of its complications may worsen the prognosis.

We report a rare case of multiple duodeno-jejuno-ileal diverticulosis presenting along with intestinal obstruction due to enterolith in the adjacent small bowel resulting in enterolith ileus.

CASE STUDY

A 75 year old gentleman presented to our department with complaints of pain in the upper abdomen and vomiting for last 8 days. The pain was of constant dull aching type, insidious in onset and gradually progressive over last 8 days, associated with post prandial bloating and multiple episodes of vomiting, aggravated after intake of food. On general appearance, patient was thin built, anaemic and vital parameters were within normal limits. On examination, abdomen was soft, tenderness was elicited in the right and left hypochondrium and

umbilical region; bowel sounds were sluggish with a normal digital rectal examination findings. Ultrasound abdomen revealed a hypoechoic lesion in the right paraumbilical region with thickened urinary bladder and grade III prostatomegaly. CECT whole abdomen revealed exophytic mass from ileal loops in right hypochondrium probably ileal GIST and diverticulum of size 4.3 cm x 4.8 cm arising from the second part of duodenum. Based on the suspected diagnosis of GIST with duodenal diverticula, exploratory laparotomy was done. Multiple diverticuli were seen throughout the course of the small bowel along the mesenteric side which were broad necked, with the presence of enterolith in three of those diverticuli and an firm ileal mass were noticed intra operatively. Excision of the exophytic ileal growth, multiple site enterotomy and removal of enterolith was done with restoration of bowel continuity by closure of enterotomy or end to end anastomosis. Few diverticuli were left as such as they had wide neck and also without any signs of inflammation. The post operative period was uneventful. Patient was gradually started on enteral feeding and was discharged on post operative day 9 with healthy wound and in a stable condition. Histopathology examination revealed benign spindle cell lesion of the growth consistent with leiomyoma, and chronic inflammatory and ischemic changes in the adjacent bowel with diverticuli for the excised ileal segment. The patient was followed up at regular interval till 9 months and found doing well.

FIGURES FIG-1



CECT image showing diverticulum FIG-2



CECT image showing enterolith within the diverticulum

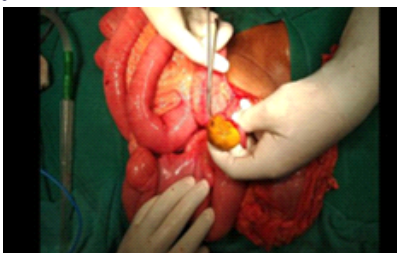
FIG-3



Jejunal diverticula with enterolith FIG-4



Multiple jejunal diverticuli mesenteric border FIG-5



Removal of enterolith from jejunal diverticula

DISCUSSION:

Small intestinal diverticula except Meckel's diverticula is a pseudodiverticula, which is typically of acquired type formed by the herniation of mucosal and submucosal layers of the bowel through the muscularis propria of the bowel wall at sites of anatomic points of weakness where blood vessels enter the intestinal wall, typically along the mesenteric border.

Duodenal diverticula, first described by Chomel in 1970, are the most common small bowel diverticula with a total incidence of 45% and 0.6% - 6% incidence on upper GI studies occurring most commonly along the mesenteric border of second part of duodenum², followed by jejunoileal diverticula (first described by Baillie and von Soemmerring in 1794 and later by Astley Cooper in 1809, presents as pulsion diverticula)³, with a prevalence of 0.02% - 5% on post-mortem and enteroclysis studies. The risk of diagnosis increases with age, with a peak seen around 6th and 7th decades of life, with male predominance. These diverticulae are mostly multiple (duodenal - 12%, jejuno-ileal - 66%) and may be frequently coexisting with diverticula in other parts of GI tract such as colon (20% - 70%), esophagus and stomach (2%) which implies possibility of a common etiology⁴. 55%- 80% of jejunoileal diverticula are located in jejunum (due to greater diameter of penetrating jejunal artery) followed by ileum (15% - 38%) and both jejunum and ileum in 5% - 7% of cases⁵.

The underlying pathology behind the formation of such diverticula is believed to be resulting from intestinal dyskinesia, causing increased intraluminal pressures and ultimately herniation of the mucosal and submucosal layers through the weakest part of the muscularis propria. The size of these diverticula may vary from few millimeters up to more than 3 cm. 95% patients are asymptomatic and the rest 5% present with non specific symptoms such as nausea, vomiting, recurrent crampy upper abdominal pain, post prandial bloating resulting from the complications of diverticula. In chronic cases, anaemia secondary to malabsorption, steatorrhea and megaloblastic anaemia (arising from vitamin B₁₂ deficiency) have been reported arising from bacterial overgrowth from blind loop syndrome due to stasis in the diverticular lumen.

Chest or abdominal radiographs may demonstrate complications of

diverticula such as perforation, with free air under the diaphragm or free peritoneal air, findings suggestive of intestinal obstruction or ileus including multiple air-fluid levels and bowel dilatation. CT is superior to other conventional imaging modalities such as upper GI or traditional enteroclysis studies and may demonstrate complications such as inflammation (diverticulitis), bleeding, localized abscess formation, intestinal obstruction (reported incidence of approximately 2.3%-4.6%⁶, due to intussusception, volvulus, fistula formation, extrinsic compression of lumen of the bowel by a fluid filled diverticulum, enterolith) or perforation. Tagged RBC scan (99 Tc labeled RBC) and mesenteric angiography are useful in the setting of hemorrhage, both as a diagnostic and therapeutic approach⁷. Double-balloon enteroscopy appear helpful in diagnosing small bowel disorders, however, emergency conditions such as obstruction or diverticulitis are significant limitations. Capsule endoscopy is a useful technique for the diagnosis of small bowel diseases, predominantly in cases of occult intestinal bleeding and in identifying diverticula in non acute setting. The enterolith were first described by Pfahler and Stamm in 1915, but enterolith causing ileus similar to gallstone ileus was first reported by Philips in 1921⁸. Ultimately, small intestinal diverticula are detected on diagnostic laparoscopy or laparotomy for other indications or for one of its complications as the presenting condition. It may present with complications in 10%-30% of the cases, with those requiring surgical intervention in 8%-30% of the patients. Leiomyomas are the fourth most common small intestinal tumors, frequently located in jejunum followed by ileum and duodenum⁹. Literature supporting co-existence of leiomyoma of small intestine with diverticuli were not found.

Asymptomatic cases may be managed conservatively with low residue diet, antispasmodics, antacids, analgesics, vitamin supplementation, and antibiotics in the initial management of blind loop syndrome. In 1906, Gordinier and Shil performed the first operation for diverticulum. In complicated diverticulosis as in obstruction, abscess formation or perforation, if the patient is hemodynamically stable or if the CT confirms perforation contained within the mesentery, patient can be managed non-operatively by nasogastric decompression, antibiotics, serial biochemical and radiological examination and image guided drainage of abscess, if present⁸. If the non operative management fails or if there is persistent severe symptoms or hemodynamic instability with evidence of peritonitis, exploratory laparotomy with resection of affected intestinal segment with primary anastomosis should be done⁴. In the setting of obstruction due to enterolith, an initial attempt at manual lysis of the stone without enterotomy may be tried, if it fails, enterotomy with retrieval of the stone can be done. The extent of the segmental resection depends on the length of the bowel affected by the diverticula. If one or multiple diverticula in a particular segment of the bowel is inflamed or perforated, segmental resection of the involved bowel with primary anastomosis should be done. If diverticula involves a long stretch of the bowel, the resection should be limited to the perforated, inflamed or scarred intestinal segment in order to avoid a short bowel syndrome¹⁰. There is risk of recurrence of diverticula post segmental resection for diverticulosis, since the mechanism of diverticula formation still remains. Hemorrhage from the diverticula can be managed by angiographic embolization but it frequently warrants segmental resection of the bowel.

CONCLUSION

Small diverticula can present in a patient varying from asymptomatic to manifestations arising out of its complications like diverticulitis, hemorrhage, fistula formation, or intestinal obstruction. Intestinal obstruction can be due to adhesions, intussusception, volvulus, extrinsic compression of bowel lumen by filled up diverticula with fluid or enterolith or luminal bowel obstruction due to transmigrated enterolith from the diverticula. Hence, a high level of clinical suspicion in acute abdominal conditions after exclusion of common pathologies in this regard is very helpful as the imaging modalities are not confirmatory to diagnosis. Early intervention and segmental bowel resection and anastomosis based on the extent of bowel involved and the diverticular anatomy and pathology as discussed helps in rendering best possible outcome.

REFERENCES:

- Coulier B, Maldague P, Bourgeois A, Broze B. Diverticulitis of the small bowel: CT diagnosis. *Abdom Imaging* 2007;32:228-33.
- Martinez-Cecilia D, Arjona-Sánchez A, Gómez-Álvarez M et al. Conservative management of perforated duodenal diverticulum: a case report and review of the literature. *World J Gastroenterol* 2008; 14(12):1949-1951.

3. Kwak JY, Park EH, Park CS, Kim JH, Han MS, Kwak JH. Uncomplicated jejunal diverticulosis with pneumoperitoneum. *Ann Surg Treat Res* 2016;90(6):346-9.
4. Kassahun WT, Fangmann J, Harms J, Bartels M, Hauss J. Complicated small-bowel diverticulosis: a case report and review of the literature. *World J Gastroenterol.* 2007;13(15):2240-2242.
5. Woods K, Williams E, Melvin W, Sharp K. Acquired jejunoileal diverticulosis and its complications: a review of the literature. *Am Surg.* 2008;74(9):849-854.
6. Nejmeddine A, Bassem A, Mohamed H, Hazem BA, Ramez B, Issam BM. Complicated jejunal diverticulosis: a case report with literature review. *N Am J Med Sci* 2009;1(4):196-9.
7. Borisa AD, Bakhshi GD, Tayade M, Pathrikar SG, Deshpande G, Joshi N. Ileal enteroliths mimicking bladder calculi. *Bombay Hosp J* 2008;50:679-81.
8. Berry DF, Willing SJ, Beers GJ. Small bowel obstruction due to enterolith: CT appearance. *J Comput Assist Tomogr* 1987; 11:707-8.
9. Igwe PO, Ray-Offor E, Allison AB, Alufohai EF. Volvulus complicating jejunal diverticulosis: a case report. *Int J Surg Case Rep* 2015;9:61-4.
10. Balducci G, Dente M, Cosenza G, Mercantini P, Salvi PF. Multiple giant diverticula of the foregut causing upper gastrointestinal obstruction. *World J Gastroenterol.* 2008, 14: 3259-3261.