

## Case Report

# The enterolith causing jejunal obstruction, an unusual presentation: A case report

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### ABSTRACT

Enteroliths are a rare cause of intestinal obstruction. Patients can present with repeated episodes of intestinal obstruction as long as an enterolith is able to pass through the gut and then suddenly, they get stuck at the terminal ileum or present with the perforation peritonitis, as may happen in case of a diverticular disease. Here, we report the case of a young male presented to the emergency room with acute intestinal obstruction. During the explorative laparotomy, an enterolith was found stuck inside the proximal jejunum which was removed through an enterotomy. This was an interesting case, as the patient did not have any predisposing factors nor did we find any evidence of other pathologies intraoperatively. Moreover, the enterolith was stuck in jejunum, contrary to the belief that terminal part of the ileum is a most common site for the enteroliths to get stuck.

**Key words:** *Diverticulosis, Enterolith, Intestinal obstruction, Intestinal stricture*

Enteroliths are a rare cause of intestinal obstruction. There have been various case reports describing this entity, but no convincing reviews were available until recently when Gurvits and Lan published their review [1]. Primary enteroliths are formed inside the small gut while secondary enteroliths enter the gut after being formed somewhere else, like from the gallbladder [2] or kidneys [3]. They are formed in the patients who are having such conditions which promote stasis of the gut content such as resection anastomosis of the gut, diverticulosis, strictures of the gut, and intra-abdominal adhesions [1].

The patients usually present with abdominal distension, vomiting, pain of the abdomen, and sometimes the features of shock. Abdominal X-rays usually reveal gas-filled gut loops with fluid inside but may reveal the radio-opaque shadows too. Contrast-enhanced computerized tomogram (CECT) of the abdomen can exactly pinpoint the size, location, and number of enteroliths, but it is not usually possible to reach a definitive diagnosis before laparotomy [4]. Although open explorative laparotomy has been recommended to milk the enteroliths into the large gut, enterotomy and sometimes resection and anastomosis of the gut segment may be required [1]. There was a time when the mortality associated with complicated enterolithiasis was up to 18%, but over the past 50 years, it has fallen down to 3% [5]. We report a case of a young male presented to the emergency room (ER) with a complaint of an acute intestinal obstruction.

### CASE REPORT

A 28-years-old male presented to the ER with 1-day history of pain of the abdomen and vomiting. The pain was sudden in onset, colicky in nature, and associated with vomiting. The vomitus was yellowish in color initially, but later, it became foul smelling and feculent. There was no history of similar complaints in the past or any surgery.

On clinical examination, his abdomen was distended with visible peristaltic gut loops. There was mild tenderness over the whole abdomen. He was slightly dehydrated. Pulse rate was 98 beats per minute. Blood pressure was 102/60 mm of Hg (millimeters of mercury) and other vitals were within the normal range. On nasogastric tube insertion, about 600 ml of foul-smelling feculent fluid was aspirated.

The X-ray examination of the abdomen showed multiple air-fluid levels in erect film. His total leukocyte count was 16,000/mm<sup>3</sup> (per cubic millimeter). Blood urea nitrogen was 26 mg/dl and serum creatinine was 1.4 mg/dl. Other biochemical and hematological parameters were within the normal range. Sonological examination of the abdomen showed multiple dilated small gut loops, showing to and fro movement of the echogenic fluid within the lumen, and minimal free fluid in the abdominal cavity. A diagnosis of acute intestinal obstruction was kept, and the patient was taken up for explorative laparotomy after adequate fluid resuscitation.

On opening the abdomen, there were multiple dilated small gut loops filled with gas and fluid. About 200 ml of serous fluid was

present in the abdominal cavity. The jejunum was dilated from the duodenojejunal junction, up to the jejunoileal transition point. At this point, a stony hard enterolith of about 4 cm×2 cm was present (Fig. 1), beyond which the jejunum and ileum were collapsed (Fig. 2). Attempts to crush the enterolith inside the gut lumen were failed, so an enterotomy was made proximally through the healthy gut and the enterolith was removed. Enterotomy was closed transversely in two layers. No other abnormality of the gut was detected. Solid organs and gallbladder were normal too. The patient made a good recovery and was discharged on the 7<sup>th</sup> post-operative day. After 3 months of follow-up, the patient is doing well.

## DISCUSSION

Intestinal obstruction is one of the common emergencies seen by any surgeon in the ER. A patient may present with only mild abdominal distension and dehydration, or they may present to the ER in a state of hypovolemic shock and gut gangrene. Over time, the treatment of small gut obstruction has evolved and the mortality associated with a small bowel obstruction (SBO) has come down to just 3%, from 50% in 1900. The most common cause of intestinal obstruction is adhesions accounting for nearly

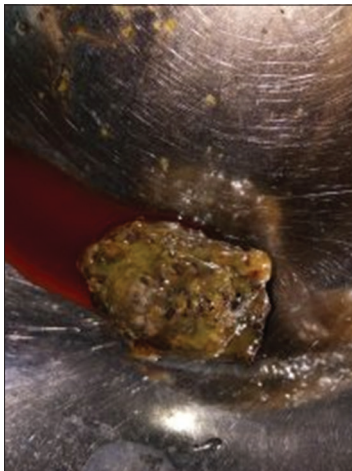


Figure 1: Enterolith extracted from the jejunum



Figure 2: Presence of Enterolith in jejunum with dilated proximal and collapsed distal segments

75% of all the cases of SBO. Enteroliths are one of the rarest causes of SBO [6]. Chomelin J described this condition in 1710 when he found an enterolith lodged in the duodenal diverticulum of an autopsy specimen [1]. After that, there have been number of case reports which have found the enteroliths in the patients having the small intestinal pathology. The incidence of enterolithiasis varies from 0.3% to 10% [1]. Grettve classified them as primary when they were formed inside the gastrointestinal tract and secondary when they were formed elsewhere and gained entry into the intestine such as gallstones [2] or renal stones [3]. The primary enteroliths are further called true when they contain the contents of chyme such as choleric acid or calcium salts and as false primary enteroliths like bezoars when they contain the aggregates of insoluble foreign material inside the gut [7]. Proximally found enteroliths almost exclusively contain choleric acid, while the distally recovered enteroliths contain calcium salts due to their precipitation in alkaline pH [8]. The enteroliths may vary from few millimeters (mm) to about 10 cm. Their number also varies from single to hundreds of stones. They may be as heavy as 100 g.

Young patients with primary enterolithiasis may present with Crohn's disease or tuberculosis while the older patients usually have a history of gastrointestinal surgeries or diverticular disease. Patients may present with a history of repeated episodes of pain, nausea, vomiting, abdominal distension, and fever. A patient may have a history of gallstones or renal stones. There may be a history of jaundice. A patient should be thoroughly examined after a good history taking. All the possible other causes such as appendicitis, diverticulitis, Meckel's diverticulum, strangulated hernia, and inflammatory bowel disease should be ruled out [1]. Mostly for any abdominal pain patient, ultrasonogram is the initial investigation which may reveal gallstones, renal stones, Meckel's diverticulum, and distended gut loops containing fluid or pelvic abscess. The plain X-ray of the abdomen may reveal dilated gut loops with air-fluid levels along with the radio-opaque densities within the gut lumen depending on the calcium content of the enteroliths [6]. A high calcium content is seen in the distal enteroliths as compared to proximal enteroliths [8]. However, the definitive diagnosis of enterolith can be made by CECT of the abdomen. It can show the exact location, size, number of the enteroliths, and rule out other pathologies [9]. 60% of the times, enteroliths are located in the right iliac fossa, entrapped in the terminal ileum, and ileocecal junction, but they may also be found inside the jejunum or colon. It is not always possible to make the pre-operative diagnosis definitively. About in half of the cases, diagnosis is confirmed at the time of laparotomy. It is believed that the enteroliths of up to 2 cm may pass through the terminal ileum, but those above 2.5 cm may lead to intestinal obstruction when they get stuck at the terminal ileum. They may directly damage the gut due to jagged edges or chemical irritation of the gut leading to perforation or stricture formation [1]. There have been case reports of adenocarcinoma being reported from the resection specimens of Crohn's disease patients with enteroliths [8].

The patients presenting with features of intestinal obstruction should be managed conservatively when the enteroliths are <2 cm. The patient should be monitored continuously while on Ryle's tube

aspiration. Fluid and electrolyte imbalance should be corrected in an expectation that the enterolith will pass into the large gut. An enterolith more than 2.5 cm is less likely to pass and will require surgery [5]. The enteroliths should be fragmented within the gut lumen and milked into the large gut. If it is not possible, then enterotomy through the proximal healthy gut should be done and all the enteroliths should be removed [10]. Whenever they present with perforation or stricture, resection of the involved gut segment with the end-to-end anastomosis of the healthy gut segments should be done [11]. People have tried to remove the enteroliths endoscopically by mechanical or electrohydraulic lithotripsy. In emergency situation, enterotomy and stone removal are the preferred choice, even for gallstone ileus. Although complicated enterolithiasis has got a mortality of up to 8%, it has fallen significantly with the advent of newer diagnostic facilities, better antibiotics, monitoring facilities, and surgical techniques [1].

## CONCLUSION

The point of interest, in this case, was an absence of any predisposing factor for enterolith formation. Most of the patients reported in the literature had some underlying disorders such as diverticulosis, Crohn's disease, and gallstones, history of gut resection and anastomosis, or strictures of the intestine. Majority of the patients reported on are old and frail having some form of gut motility disorders. This patient was only 28-year-old without any predisposing factors. These findings suggest that there is still a lot to be learned about this rare cause of intestinal obstruction.

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