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Case Report

Primary Enterolith in a Patient with Intestinal Tuberculosis: A Case Report

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Abstract

Primary enterolithiasis is a rare surgical ailment. The underlying cause is intestinal stasis. Numerous anatomical and micro environmental factors such as enteritis, incarcerated hernia, malignancy, diverticula, blind loops, and enteroenterostomy predispose to clinically significant concretions. Enterolithiasis in tuberculosis can be due to the presence of strictures, intestinal bands, or interbowel/parietal adhesions, leading to intestinal stasis. Secondary enterolithiasis is generally caused by gallstones or renal stones migrating to the gastrointestinal tract due to fistula formation. During stasis, food particles act as a nidus and calcium salts are deposited over the food particles, leading to stone formation. A 57-year-old male patient presented to the Emergency Department of Jawaharlal Nehru Medical College, AMU, Aligarh, with features of intestinal obstruction. The patient underwent emergency laparotomy, revealing 2 strictures in the distal ileum with 15.24cm of the bowel between them containing a 2×2 cm enterolith. The strictured segment was resected, and end ileostomy and mucus fistula were created. The patient's postoperative recovery was fine, and he wasdischarged with ileostomy on antitubercular treatment (after histopathologicalconfirmation). Ileostomy closure wasplanned after 6 weeks. The incidence and prevalence of enterolithiasis has been on the rise recently because of advancement in radiological imaging studies. Endoscopic and surgical stone removal along with the treatment of the underlying pathology is recommended.

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Keywords ● Enterolithiasis ● Tuberculosis ● Intestinal obstruction ● Laparotomy

What's Known

- Enterolithiasis or the presence of stone in the intestine is an uncommon clinical condition. Primary enteroliths arise due to the stasis of intestinal contents.
- Secondary enteroliths are caused by the migration of renal stones or gallstones. As reported in previous studies, the prevelance of primary and secondary enterolithiasis ranges between 0.3% and 10%.

What's New

- Possible pathophysiology behind the enterolithiasis in our patient was the stasis of particles between the strictures.
- Food particles act as a nidus for stone formation, and crystallization occurs due to the inflammatory mechanism in the bowel.

Introduction

Enterolithiasis or the presence of stone in the intestine is an uncommon clinical condition. Primary enteroliths arise due to the stasis of the intestinal contents, and the underlying pathologies include diverticular disease, blind pouches, intestinal stenosis, and strictures.[1,2] Enteroliths formed due to stasis are predominant in abdominal tuberculosis.[3] Secondary enteroliths can be caused by the migration of renal stones or gallstones into the gastrointestinal tract. According to previous studies, the prevalence of primary and secondary enterolithiasis ranges between 0.3% and 10%.[4]

Intestinal stasis leads to the crystallization of food particles by calcium salt. The terminal ileum is the most common location in the small intestine because of its alkaline pH and high calcium concentration.

There has been an increase in the incidence of enterolithiasis in recent times due to the advancement in radiological investigations. It should be noted that tuberculosis as a cause of enterolithiasis is very rare.

We report a case of enterolithiasis presenting a diagnostic dilemma, which was solved only after exploratory laparotomy

Case Report

A 57-year-old male patient presented with complaints of abdominal pain, distension of abdomen, non-passage of stool, and vomiting of 1 week's duration to the Emergency Department of Jawaharlal Nehru Medical College, AMU, Aligarh. The pain was colicky, and it progressed to dull ache and was moderate in intensity. The patient reported similar episodes of pain 2 weeks earlier, which was subsided by conservative management. He had no history of diarrhea, weight loss, or chronic cough. His past medical history included treatment of pulmonary tuberculosis 1year previously.

The patient had never undergone surgery or gastrointestinal endoscopy in the past. On examination, the abdomen was soft but distended. In addition, visible peristalsis was present over the abdomen, and the bowel sounds were exaggerated. There were no scars on the abdomen and pelvis, and nor was there any evidence of groin hernias. Rectal examination was unremarkable.

Laboratory tests revealed a normal hemoglobin and leucocyte count and increased ESR. Erect chest X-ray showed multiple opacities in the bilateral lung field with emphysematous changes (figure 1). The abdominal plain film showed dilated small bowel loops with multiple air fluid levels. There was a radio-opaque shadow in the right lower abdomen, the significance of which was unclear. Consequently, an ultrasonography of the abdomen was done. The ultrasonography was suggestive of the intussusception of the bowel loops in the right lower abdomen, causing features of intestinal obstruction. A diagnosis of small bowel obstruction was made. The patient was advised laparotomy, but he refused any surgical intervention; he was, therefore, managed conservatively. He started passing flatus and stools on the second day. Repeat abdominal plain film showed improvement in the condition of the small bowel, with a change in the position of the radio-opaque shadow in the pelvis from the right side of the abdomen in the previous film to the left side. The general condition of the patient improved, and he was discharged on personal request on the fifth day.

Three days after discharge, the patient again reported with similar complaints and was readmitted. Plain film of the abdomen showed multiple air fluid levels with a radio-opaque shadow in the pelvis. A diagnosis of acute intestinal obstruction was made and exploratory laparotomy was planned.

Perioperatively, there was a band present constricting the small bowel at approximately 122 cm distal to the duodenojejunal junction. Two strictures were present in the small bowel: the first one at approximately 228 cm distal to the duodenojejunal junction and the second on eat almost 45 cm distal to the first one. A stone (2×2 cm in size, oval in shape, dark brown in color, and hard in consistency) was present between the 2strictures. There was mesenteric creeping over the small bowel at multiple places (figure 2).

Release of band with the resection of the stricture segment was performed, and end ileostomy and mucus fistula were created. Histopathological examination of the resected specimen showed transmural inflammation with caseating granuloma along with numerous epithelioid cells, confirming the diagnosis of

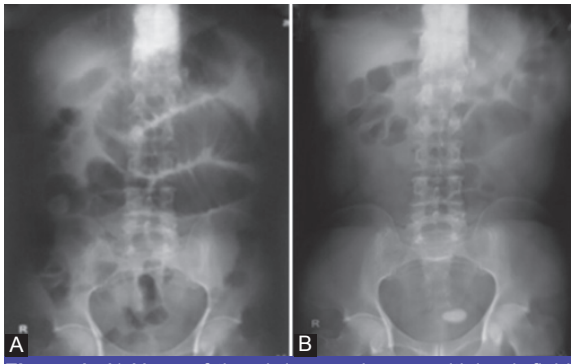

Figure 1: A) X-ray of the abdomen shows multiple air fluid levels with a radio-opaque shadow onthe right side of the abdomen. B) X-ray of the abdomen demonstrates multiple air fluid levels with a radio-opaque shadow in the pelvis.

Figure 2: Multiple strictures of the small bowel are revealed on exploratory laparotomy.

tuberculosis. The patient was discharged after an uneventful postoperative stay of 8 days on antitubercular drugs and care of ileostomy (figure 3). The rare pathophysiology of post-tuberculosis enterolithiasis was explained to the patient, and informed consent was taken from him for the publication of his case in a medical journal. The patient was followed up. He underwent ileostomy closure after 8weeks. He had a satisfactory recovery after ileostomy closure and was discharged in good general condition on antitubercular drug therapy. Hewas followed up monthly for 9 months, during which hetook ATT.

Discussion

Chomelin J., a French physician, was the first to describe enterolithiasis in 1710 in his medical series of Historie de l'Academie Royal[5] as a case of stone formation in a duodenal diverticulum discovered during an autopsy. In the early twentieth century, there were additional reports of distal small bowel obstruction secondary to enterolithiasis in the terminal ileum.

There has recently been an increase in the reported cases owing to the rapid development of gastrointestinal and imaging techniques. Williams in 1908 and Edwards in1930 reported a few cases of enterolithiasis.[6] The chemical composition of enteroliths was reported by Sjoqvist[4] in 1908. Pfahler[5] was the first to make the radiological diagnosis of enterolithiasis in 1915. By the mid twentieth century, De Witt et al.[6] reported their case series on enterolithiasis amongst a wide age population and shed further light by additional individual case reports. Enterolithiasis may even present in the new born age group. Rarely, intraluminal calcified meconium presents as enterolithiasis innewborns.[7] It has become readily recognized that primary enteroliths result from stasis, leading to clumping and elimination. Diverticular disease of the small bowel is a leading etiology, followed by stricturing of the intestine from infectious (tuberculosis) or inflammatory (Crohn's disease) processes. Enteroliths were categorized in to primary and secondary types by Grettve in 1947. Primary enteroliths were further subcategorized by Atwell and Pollock[8] in 1960 into true and false stones on the basis of chemical composition.

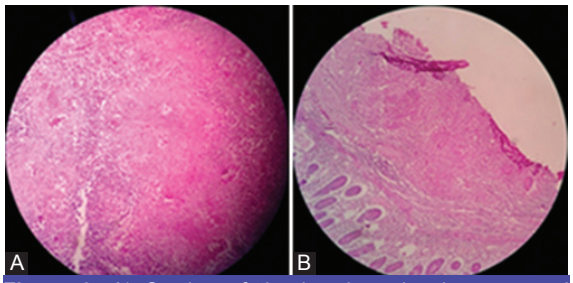

Figure 3: A) Section of the lymph node shows normal follicles with granuloma formation, comprising areas of necrosis with Langhans giant cells surrounded by an admixture of epithelioid cells and lymphocytes. B) Section of the intestine demonstrateschronic inflammatory infiltrates with the presence ofLanghansgiant cells along with areas of necrosis.

The colon, including the appendix, is the most common location of enterolithiasis. In the small intestine, the most common location is the terminal ileum, where alkaline pH favors calcium salt precipitation over food particles which act as a nidus.[9]

The decreased motility or stasis of the bowel seems to be the crucial pathognomonic factor in the formation of enteroliths. The anatomic alterations of the gastrointestinal tract (e.g., diverticula, duplication cysts, or pathological conditions such as strictures due to bowel diseases like Crohn's disease or tuberculosis) may be associated with the stasis of the intestinal contents. The stasis of the contents in the intestine leads to crystallization and subsequent formation of stone.[10] Bowel resection and anastomosis may also lead to blind loop formation and result in the continuous deposition of the intestinal contents. The examination of the stone mainly shows fecal material similar to a true primary enterolith.[11] The presence of an enterolith, even in the absence of intestinal obstruction, should warn us of the possibility of an intestinal stricture.

Stones in the intestine may remain asymptomatic, dissolve spontaneously, and pass slowly through the gastrointestinal tract. Symptoms may include bleeding, diverticulitis, intestinal obstruction, and abdominal pain. Interestingly, the patient in our case report complained of recurrent episodes of pain abdomen and signs of intestinal obstruction. Enterolithiasis may also present with peritonitis secondary to perforation.[12]

X-ray detection of enterolithiasis depends on the calcium content of the stone. The differential diagnosis includes gallstones, urolithiasis, calcified lymph nodes, and pancreatic calcifications. The most important radiological signs are typical dense rim with a pale core in oval, round, or rectangular shadows, "coin-end-on" appearance of the shadows, wide mobility of radio-opaque shadows in relation to the fixed structures in successive plain radiographs of the abdomen, and wide separation in one with closeting together in other radiographs. These stones may change their location on radiographs due to the peristaltic movements of the bowel.[13,14]

In our patient also, repeat abdominal plain films showed a change in the position of the radio-opaque shadow in the pelvis from the right side of the abdomen in the previous film to the left side.

Intestinal tuberculosis causes strictures of the intestine and impairs the intestinal flow, creatingfavorable conditions for the development of stones in the intestine. Nevertheless, enteroliths are a very rare condition in tuberculosis since most patients never become symptomatic or because symptoms are not attributable to enteroliths.

In summary, there is no evidence for the prophylactic treatment of asymptomatic enterolithiasis in tuberculosis. Patients with intestinal obstruction require laparotomy with strictureplasty or segmental bowel resection. In the present case, the presence of a radio-opaque shadow that kept on changing its position posed a diagnostic dilemma, which was solved only after laparotomy.

Conclusion

Enterolithiasis is a rare finding, but its incidence and prevalence has been on the rise in recent times. Stasis secondary to various underlying pathologies plays a significant role in the pathogenesis of this disease and provides an important clue in its etiologic recognition, chemical classification, and clinical presentation. The disease process can be identified on the basis of primary and secondary enterolithiases. Clinical diagnosis depends on the history and physical examination of the patient supported by radiological imaging. Though rare, the presence of a radio-opaque shadow in the setting of intestinal obstruction should raise the suspicion of enterolithiasis. The use of a minimally invasive technique should be tried to treat this condition initially; nevertheless, most cases will require exploratory laparotomy because of multiple strictured bowel segments.

Our patient was a case of Koch's abdomen presenting with acute intestinal obstruction. Perioperatively, there was a stone present between 2strictures in the distal ileum. The possible pathophysiology behind the enterolithiasis is the stasis of digestive juices and food particles between the strictures. These food particles act as a nidus for stone formation, and crystallization occurs due to the inflammatory mechanism in the bowel because of chronic inflammation secondary to tuberculosis.

Most of the previously reported cases related to enterolithiasis are of cholelithiasis, nephrolithiasis, and Crohn's disease. Very few cases have been reported with tuberculosis being the underlying cause.

Conflict of Interest: None declared.

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