Small Bowel Obstruction Caused By A Meckel's Diverticulum Enterolith

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Citation

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Abstract

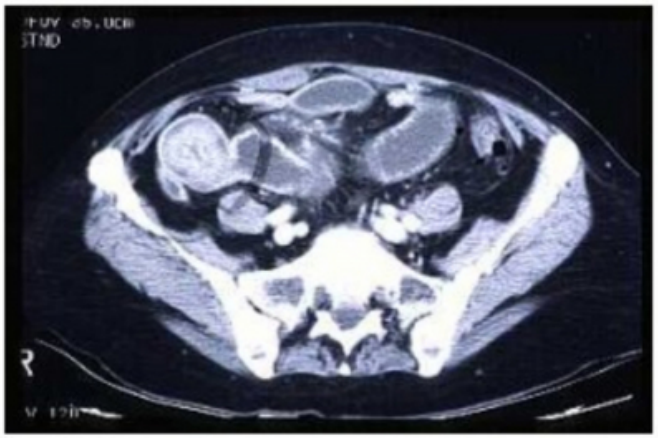
Meckel's diverticulum, the most common congenital anomaly of the gastrointestinal tract, occurs as a result of failure of complete obliteration of the omphalomesenteric duct. It contains all layers of normal intestinal wall and receives its blood supply from a terminal branch of the superior mesenteric artery. It is found on average 55 cm proximal to the ileocecal valve. Although it can be present in up to 3% of the population, the vast majority of cases are asymptomatic and discovered incidentally during laparotomy or autopsy (1). Occasionally, symptoms result from complications and may require surgical intervention. An unusual case of intestinal obstruction caused by stone formed within the diverticulum is presented. Less than 10 cases of this condition have been previously reported.

CASE REPORT

A 60-year old woman presented to the emergency room complaining of mild abdominal distension and diffuse abdominal pain for about 24 hours. There was no history of fever, diarrhea or vomiting. Her white blood cell count was 15,700/mm3 without left shift. Abdominal hysterectomy had been performed 4 years earlier. Abdominal x-rays revealed air fluid levels within mildly dilated loops of small bowel, consistent with early intestinal obstruction. A computerized tomography scan of the abdomen suggested a questionable mass in the distal ileum, the large bowel was normal (Figure 1), and the patient underwent laparotomy after twenty-four hours of observation.

Figure 1

Figure 1: Abdominal CT scan revealed a mass within the lumen of the small bowel (encircled) corresponding to the enterolith. Note dilated loop of small bowel proximal to the enterolith.

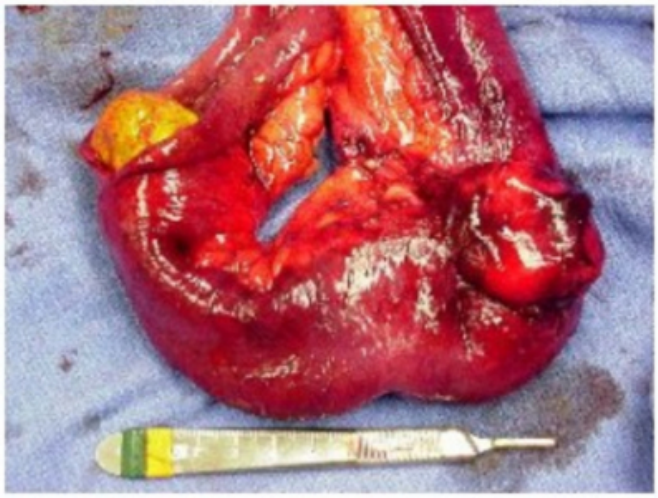


During exploratory laparotomy, dilated small bowel loops were encountered and a very hard intraluminal mass in the distal ileum was identified, which was the point of obstruction. Fifteen centimeters proximal to that, an outpouching of the small bowel was found on the antimesenteric border, representing a Meckel's diverticulum. It was 3.5 cm in diameter, wide mouthed and was located 50 cm proximal to the ileocecal valve. The palpable mass and the diverticulum were resected en bloc, and an end-to-end hand sewn anastomosis performed. Opening the specimen in the operating room revealed a yellow enterolith of 4 cm in

diameter, which caused the obstruction, and had the identical shape and size as the Meckel's diverticulum located 15 cm proximal to it (Figure 2).

Figure 2

Figure 2: An enterolith is observed 15 cm distal to the Meckel's diverticulum, which was located 50 cm proximal to the ileo-cecal valve.



The postoperative recovery was uneventful and the patient was sent home on postoperative day 8, tolerating a regular diet. Pathologic examination of the surgical specimen showed thickening of the entire diverticular wall (0.9 cm). Prominent inflammatory changes were present, with scattered hemorrhagic areas in the mucosa. The serosa demonstrated fibrinopurulent changes. Upon follow up, six months later, the patient was asymptomatic.

DISCUSSION

Meckel's diverticulum is usually asymptomatic, but it can result in complications including intestinal obstruction, hemorrhage from associated ectopic gastric mucosa, diverticulitis, perforation and neoplasia ([2]). Small bowel obstruction can be the result of intussusception, strangulation due to a mesodiverticular band or volvulus ([3]). Rarely, an impacted stone formed within the diverticulum itself can migrate and lead to intestinal obstruction.

In general, enteroliths rarely form within the gastrointestinal tract, except in certain pathologic conditions like Crohn's disease or blind loop syndrome ([4]). Although Meckel's diverticulum is an area of stasis, it is a very unusual site of enterolith formation ([5]). Small bowel calculi tend to develop in the alkaline medium of the distal small intestine (4). Calcium from the intestinal contents can precipitate initiating the process of stone formation. Stones can be associated with abdominal pain and anemia, or can be released into the intestinal lumen causing intestinal obstruction ([6]). Typical signs and symptoms are those of intestinal obstruction including abdominal pain, nausea, vomiting, and abdominal distension. A male predominance has been noted (7 out 9 cases reported to date) and most patients have no previous abdominal complaints. The preoperative radiological diagnosis of Meckel's stone ileus is unlikely as radiopacity is demonstrated in less than 50% of cases. When seen, stones are multifaceted and typically have a radiolucent center ([7]). In our case, chemical analysis of the stone was not performed, but Benhamou has reported the presence of cholesterol, calcium, oxalate and phosphate ([8]). Because of the rarity of a Meckel's enterolith, there is only anecdotal experience with the use of CT scans in the diagnosis of this condition (2).

The management of a Meckel's diverticulum found incidentally during laparotomy is controversial. The rationale for resection of an asymptomatic Meckel's diverticulum is to prevent future complications. Peoples et al. ([9]) have concluded that the lifetime risk of developing symptoms from a Meckel's diverticulum is low (6.2%), with the majority of such events occurring during the first 2 decades of life. Morbidity and mortality associated with the surgical treatment of symptomatic Meckel's diverticula is 8.5% and 1.6%, respectively; and for incidental resection, morbidity is 4.1% and mortality is 0.2%. Based on this information, incidental diverticulectomy has been discouraged, nevertheless some authors have reported an operative morbidity of 2% following resection of incidentally discovered diverticula, and recommended that resection should be performed routinely in the absence of peritonitis or other conditions precluding the safe performance of the procedure ([10]). Most surgeons would advise the removal of an asymptomatic diverticulum when found incidentally at laparotomy in pediatric patients and young adults if there is attachment either by bands to the umbilicus or by a mesodiverticular vascular strand, or if there is any palpable thickening or adhesions suggestive of ectopic tissue. A wide-mouthed, thin walled unattached diverticulum in an adult patient can probably quite safely be left alone ([11,12]).

Symptomatic Meckel's diverticula should undergo resection. Whether diverticulectomy or segmental resection should be performed is a matter of controversy. The widespread use of staplers in surgery in recent years has enabled faster resection of Meckel's diverticulum without opening the

bowel's lumen ([13]). For the surgical treatment of Meckel's stone ileus, the portion of the small bowel containing the impacted stone can be resected en block with the diverticulum, or the stone can be removed by manipulation through an enterotomy. The possibility of gallstone ileus should always be considered and the right upper quadrant should be examined for biliary pathology ([14]).

In conclusion, Meckel's stone ileus is a very unusual complication of Meckel's diverticulum that should be included in the differential diagnosis of small bowel obstruction, especially in those patients without history of previous abdominal surgical procedures. Surgical treatment is required and should include resection of the diverticulum.

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