

# Meckel's diverticulum lithiasis: A case of small bowel obstruction due to a migrated Meckel's Enterolith

I. D. Kyriazanos, K. Tambaropoulos, H. Martinos, G. Pechlivanidis, D. Davidis, G. Noussis

*Department of Surgery, Naval and Veterans Hospital of Athens, Athens, Greece*

For correspondence:

Ioannis D. Kyriazanos, 22, Thetidos str, P. Faliro, 17561, Athens, Greece, E-mail: medkyri@yahoo.com

## ABSTRACT

We report a case of small bowel obstruction due to a stone formatted within a Meckel's diverticulum, expelled into the lumen and impacted prior to the ileocecal valve. Only a small number of ileus due to Meckel's diverticulum lithiasis has been described in the literature. Meckel's diverticulum as congenital out-pouchings of the small bowel can be liable to bleeding, perforation, obstruction and rarely to enterolith formation. Extrusion of the stone from the diverticulum can lead to acute small bowel obstruction. In patients presenting with acute mechanical small bowel obstruction without an obvious cause, Meckel's lithiasis should be included in the differential diagnosis.

**Key words:** Meckel's diverticulum, enterolith, small bowel obstruction.

How to cite this article:

Kyriazanos ID, Tambaropoulos K, Martinos H, Pechlivanidis G, Davidis D, Noussis G. Meckel's diverticulum lithiasis: A case of small bowel obstruction due to a migrated Meckel's Enterolith. *Indian J Surg* 2006;68:41-3.

## INTRODUCTION

Hernias, adhesions following abdominal operations and malignant neoplasms are the main causes of mechanical small bowel obstruction (SBO). In the absence of these pathological conditions, other causes must be considered responsible for SBO. Among these enteroliths (stones of the gastrointestinal tract) formed within small bowel projections may extrude into the lumen, impact and produce SBO.<sup>[1]</sup> Ileus due to enteroliths expelled from Meckel's diverticulum is a rare condition and relevant literature is available only in the form of case report. Our recent experience with such a patient is the basis of this report.

## CASE REPORT

A 72-year-old Caucasian man presented to our Emergency Dept with a 72-h history of

abdominal pain, nausea and vomiting. The pain was colicky, sharp and intermittent in nature. Past medical history included a bilateral groin hernia repair and appendectomy but without signs of herniation in the scars. The patient denied previous biliary colic.

On physical examination, his abdomen was distended, without rebound or tenderness and with hyperactive bowel sounds in auscultation. Plain abdominal X-rays were consistent with a mechanical SBO without free air or pneumobilia. An opacity in the right side of the abdominal cavity was identified with calcified periphery and a radiolucent centre. US examination of the upper abdomen revealed normal biliary tree. Twenty-four hours later the patient remained distended and was taken for celiotomy. During exploration, a Meckel's diverticulum was found about 40 cm proximal to the ileocecal valve. Palpation revealed the presence of a stone, impacted prior to the valve. The stomach, the duodenum, the colon and the rest of the small bowel were normal. No evidence of cholelithiasis or biliary-enteric communication completed the exploration. After palpation the enterolith was freed and pushed back inside Meckel's diverticulum, which

had a relatively wide neck. Meckel's diverticulum with the enterolith inside was resected at its neck with the use of a GIA stapling device. The postoperative course was uneventful and the patient was discharged on the seventh postoperative day.

## DISCUSSION

Meckel's diverticulum is the most common congenital diverticulum of the small intestine occurring in about 0.3-3% of the population at autopsy, typically 60 cm from the ileocecal valve.<sup>[2]</sup> It has 4.2% likelihood to become symptomatic during lifetime, presented with acute gastrointestinal bleeding, intussusception, inflammation or perforation and SBO, although unusual during childhood, becomes its most common complication during adulthood.<sup>[3,4]</sup>

Enterolith formation is a rare complication of Meckel's diverticulum. Although the alkalinity of the distal small bowel favours precipitation of mineral salts, the wide necks of most diverticula as well as smooth muscle peristalsis prevent pooling of intestinal content, inspissation and enterolith formation.<sup>[5]</sup> As a result only 50 cases of Meckel's diverticula with lithiasis have been reported.<sup>[6]</sup> Kusumoto *et al* identified stones in only two patients out of 776 with Meckel's diverticulum, when Pantongrag-Brown *et al* reported an incidence of 10% of all Meckel's diverticulum lithiasis.<sup>[3]</sup>

Formation of enteroliths in Meckel's diverticula is usually multiple (75%) and occurs more commonly in diverticula that do not usually contain ectopic gastric mucosa. Like this the alkaline environment favours the precipitation of calcium and other minerals and the stone formation.<sup>[7]</sup> We found a sole enterolith, 3.5 cm in maximum dimension, and with a calcified crystalline structure in cut sections, indicative of its origin from the distal small bowel.<sup>[8]</sup>

Meckel's diverticulum lithiasis can cause intermittent abdominal pain, chronic gastrointestinal blood loss as well as diverticulitis, perforation or SBO. The presence of stones in Meckel's diverticulum predispose to SBO by promoting local inflammation of the diverticulum and intussusception or by impaction of the enterolith following its extrusion from the diverticulum. Ileus caused by extrusion of an enterolith from a Meckel's diverticulum is extremely rare with only 5 cases having been reported.<sup>[6]</sup>

Accurate diagnosis of SBO due to enterolith impaction is generally demanding. In abdominal plain film, radio-opaque Meckel's enteroliths can be visualized in 87% of the cases and in different sites of the abdominal cavity, suggesting that Meckel's enteroliths, albeit rare, should be included in the differential diagnosis of

abdominal calcification.<sup>[2]</sup> However, water-soluble small-bowel contrast studies and cross-sectional imaging modalities such as CT and US have been considered more useful in diagnosing stone ileus.<sup>[7]</sup> Ileus due to Meckel's enterolith must be differentiated from gallstone ileus, appendicolith, teratoma and calcified lymphnodes.<sup>[6]</sup> Differentiation from gallstone ileus is difficult as both diseases have a chronic course with superimposed acute SBO. However, pneumobilia on abdominal plain film suggests gallstone ileus and the diagnosis of enterolith ileus can be established only after documenting the normalcy of the gall bladder as we did in our patient.<sup>[9]</sup>

Delay in diagnosis and treatment of enterolith's ileus can lead to complications such as ulceration, haemorrhage and even perforation. Despite exceptionally rare occurrence of stones being defecated, patients with enterolith ileus almost always need operative intervention. Most of the patients with enterolith ileus do, however, undergo a non-operative treatment initially, because of the lack of specificity of clinical features and difficulty in establishing the diagnosis. Generally, operative management includes enterolith fragmentation and milking into the proximal colon, or enterolith removal thought an enterotomy. Meckel's diverticulum has also to be resected to prevent recurrent stone formation and further complications. Bowel resection with primary anastomosis is indicated in cases of inflammation, perforation, and necrotic bowel. The use of diagnostic laparoscopy as well as laparoscopic assisted operations is advocated as particularly useful.<sup>[10]</sup> Despite the selected method, inspection of the entire bowel for the presence of additional enteroliths remains mandatory, as missed enteroliths may impact at a later stage and warrant re-exploration. In conclusion, patients presenting acute mechanical small bowel obstruction without an obvious cause (no antecedent history of abdominal surgery, gall bladder disease or hernias incarcerated) ileus due to Meckel's lithiasis and extruded enterolith should be included in the differential diagnosis.

## REFERENCES

1. Klinger JP, Seelig HM, Floch RN, Branton AS, Metzger PP. Small-Intestinal enteroliths. Unusual cause of small-intestinal obstruction. *Dis Colon Rectum* 1999;42:676-9.
2. Phelan M, Kaufman H, Becker J, Fitzpatrick G. Small bowel obstruction by jejunal enterolith. *Surgery* 1997;122:229-30.
3. Wounter Van Es H, Sybrandy R. Case 19: Enteroliths in a Meckel's diverticulum. *Radiology* 2000;214:526.
4. Rudge FW. Meckel's stone ileus. *Mil Med* 1992;157:98-100.
5. Tosato F, Corsini F, Marano S, Palermo S, Piraino A, Carnevale L, *et al.* Ileal occlusion caused by enterolith migrated from Meckel's diverticulum. *Ann Ital Chir* 2000;71:393-6.
6. Gamblin TC, Glenn J, Herring D, Mc Kinney WB. Bowel obstruction caused by a Meckel's diverticulum enterolith: A

- case report and review of the literature. *Curr Surg* 2003;60:63-4.
7. Nakamoto Y, Saga T, Fujishiro S, Washida M, Churiki M, Matsuda K. Gallstone ileus with impaction at the neck of a Meckel's diverticulum. *Br J Radiol* 1998;71:1320-22.
  8. Atwell JD, Pollack AJ. Intestinal calculi. *Br J Surg* 1960;47:367-74.
  9. Clavien PA, Richon J, Burgan S, Rohner A. Gallstone ileus. *Br J Surg* 1990;77:737-42.
  10. Shah SR, Bhaduri A, Desai DC, Abraham P, Joshi A. Obstructing enterolith as presenting feature in Crohn's disease. *Indian J Gastroenterol* 2003;22:24.