CASE REPORT

Small bowel obstruction secondary to a liberated Meckel's enterolith

Vias Demetriou,¹ David McKean,² James Briggs,² Niall Moore²

¹Vias Demetriou Ltd, Oxford, UK

²Department of Clinical Radiology, Oxford Radcliffe Hospitals NHS Trust, Oxford, UK

Correspondence to

Vias Demetriou,
viasdemetriou@gmail.com

SUMMARY

A 30-year-old woman presented with a short history of abdominal pain which rapidly progressed to absolute constipation. An abdominal radiograph demonstrated a paucity of bowel gas and a 4 cm lesion with concentric laminar calcification projected over the pelvis. A CT scan revealed a 4 cm giant Meckel's diverticulum, downstream of which a laminated mass was impacted in the lumen of the distal ileum causing small bowel obstruction. Subsequent surgery confirmed small bowel obstruction secondary to impaction of a liberated enterolith from the giant Meckel's diverticulum. The history, imaging appearances and surgical findings in this case are classical of this unusual but treatable condition.

BACKGROUND

The differential diagnosis of acute abdominal pain is wide but awareness of the more unusual causes can be vital to direct correct and appropriate management. Our case demonstrates the typical presentation and treatment of the rare condition of small bowel obstruction secondary to an enterolith expelled from Meckel's diverticulum (MD).

The formation of enteroliths within the gastrointestinal tract is a complication of diverticulosis but rarely radiologically demonstrated because only one-third of calculi are radio-opaque. However, when laminated abdominal calcifications are seen on abdominal radiographs in the context of bowel obstruction, liberated enteroliths must be included in the differential diagnosis. Obstruction owing to Meckel's enterolithiasis is extremely rare and liberation of formed enteroliths is even more so because the majority form without ever being expelled from their diverticulum.

Awareness of the characteristic plain film and CT findings of Meckel's enteroliths is essential for prompt and accurate diagnosis. Delay in diagnosis and treatment of enterolith ileus could lead to complications including ulceration, haemorrhage or perforation.

CASE PRESENTATION

A 30-year-old woman presented with a 2-day history of worsening colicky abdominal pain across her lower abdomen. This was associated with distension and had progressed to absolute constipation on admission. She had no significant medical history, and in particular had never had abdominal surgery. The patient was normotensive and mildly tachycardic. Clinical findings included a distended, tympanitic abdomen but no evidence of

peritonism. The hernial orifices were clear. Digital rectal examination was unremarkable. Her initial blood tests showed a modest rise in inflammatory markers but were otherwise normal.

INVESTIGATIONS

An abdominal plain film revealed a paucity of bowel gas and 4 cm×3 cm lesion with concentric laminated calcification in the left pelvis (figure 1).

A subsequent CT of the abdomen and pelvis demonstrated a laminated mass impacted in the lumen of the distal ileum and causing small bowel obstruction. The more distal small bowel was collapsed. Upstream of the lesion a 4 cm diverticulum was seen containing a peripheral rim of calcification (figure 2). There was no pneumobilia or evidence of gallstones on CT.

TREATMENT

Laparotomy confirmed the presence of a MD with downstream obstruction of the small bowel by an enterolith. The enterolith was milked upstream into the diverticulum and the diverticulum was then excised.

OUTCOME AND FOLLOW-UP

The patient underwent a full and uncomplicated recovery and was discharged from hospital 3 days later. There were no postoperative complications.

DISCUSSION

In the human embryo the midgut communicates with the yolk sac via a narrow stalk until the 10th week of development. A MD represents a failure of obliteration of the proximal portion of this vitelline stalk.¹ With a prevalence of 2–4% of the population it is the most common congenital anomaly of the gastrointestinal system.¹ It is a true diverticulum, containing all layers of the small bowel and lies on the antimesenteric border of the ileum, typically 2 feet from the ileocaecal valve. Cullen *et al*² have estimated the lifetime risk of requiring an operation owing to complications from a MD at 6.4%, while according to a study published by Park *et al*,³ 238 out of 1476 (16%) MD found operatively were symptomatic. The commonest presentations reported in the Park study were bleeding and obstruction.

MD are known to effect small bowel obstruction via a number of mechanisms, including volvulus, intussusception, bezoar formation, mesodiverticular bands, neoplasm and through the formation of enteroliths. The latter are calcified concretions that have rarely been documented in MD. This may be

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Figure 1 Plain radiograph demonstrating calcification within left pelvis (white arrow).

accounted for by the peristaltic capabilities of MD as a true diverticulum, or by the frequent presence of heterotopic gastric mucosa, providing an acidic local environment which discourages the precipitation of enteroliths.⁴

There have been five reported cases of small bowel obstruction secondary to impaction of an expelled Meckel's enterolith in the distal ileum.⁵ Jones *et al*⁶ have also reported an intriguing case of small bowel obstruction secondary to a Mirizzi-type compression of a MD laden with enteroliths, while Lopez *et al*⁷ report a similar case of a Meckel's enterolith in situ causing

Figure 2 Axial CT showing impacted enterolith (thin arrow) in terminal ileum causing proximal obstruction. The Meckel's diverticulum is visible in the same frame with calcification in the wall (thick arrow) and a widened neck consistent with expulsion of the enterolith.

localised scarring leading to obstruction. With the exception of the latter report, the obstructing enteroliths in these cases were not visible on abdominal radiographs. The enterolith in our case was clearly visible on plain abdominal film, consistent with the Pantongrag-Brown experience where seven out of eight cases of Meckel's enterolith were visible on plain film and 16 out of 18 stones had peripheral calcification with radiolucent centres.⁴

The differential diagnosis for this radiographic appearance includes gallstone ileus, appendicolith, leiomyoma, vascular calcification, faecolith, teratoma, calcification of pelvic kidney, osseous metaplasia of the myometrium, calcified tumours and lithopaedion. Treatment options for impacted Meckel's enteroliths include milking the enterolith through into the caecum (though this may run the risk of causing perforation), milking the stone more proximally for removal through enterostomy or with the MD itself,⁸ or ileal resection with primary anastomosis.^{5,9}

Learning points

- ▶ We report a rare case of small bowel obstruction secondary to extrusion of an enterolith from a Meckel's diverticulum.
- ▶ Liberated enterolith must be considered as one of the rare causes of small bowel obstruction.
- ▶ Although rare entities they should form part of the differential diagnosis, particularly when there has been no prior abdominal surgery and when a radio-opaque mass is evident on the plain film.
- ▶ Awareness of the characteristic radiological findings of Meckel's enteroliths is essential for prompt and accurate diagnosis to direct appropriate surgical management.

Contributors Registrar was responsible for the diagnosis and has contributed to the editing of manuscript.

Competing interests None.

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