

Case Report

A shrimply amazing tale: a rare case of a perforated Meckel's diverticulum secondary to a prawn head

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ABSTRACT

Majority of patients with a Meckels diverticulum remain asymptomatic. However, complications can occur in 4% of patient and tend to present with an acute surgical pathology commonly present with bleeding, obstruction, intussusception or neoplasm. Rarely, people present with a perforation of a Meckel's secondary to a foreign body. This is an interesting case report of a patient presenting with a perforated Meckel's secondary to a prawn head. Foreign body perforation of a Meckel's is quite rare and should be suspected in patients with an acute abdomen, especially in patients with symptoms suggestive of appendicitis. A combination of history, examination and imaging can help narrow the diagnosis. However, a through examination of the small bowel must be performed, especially if the appendix appears normal, to look for a perforated Meckel's.

Keywords: General surgery, Foreign body, Perforation, Unique

INTRODUCTION

Meckel's diverticulum was first described in 1598 by Wilhelm Fabricius Hildanus, however it was eponymously named after Johann Friedrich Meckel, the Younger, who described the anatomy and embryology in 1809.¹ Like the appendix, is a true diverticulum wherein it contains all three layers of the bowel, and has its own blood supply from the remnant of the vitelline artery, an emanating branch of the distal ileal branch of the superior mesenteric artery.² It is the most common gastrointestinal malformation, formed by the incomplete obliteration of the omphaloenteric duct, which normally disappears between the 6th and 8th week of gestation.³ It is commonly associated with the rule of two's- present in 2% of population, present ~2 ft (60 cm) proximal to the ileocaecal valve, ~2 in length, commonly presents before the age of two, and has two types of heterotopic mucosa (gastric and pancreatic).⁴ Majority of patients with a

Meckels diverticulum remain asymptomatic. However, complications can occur in 4% of patient and tend to present with an acute surgical pathology commonly present with bleeding, obstruction, intussusception or neoplasm.⁵ Rarely, people present with a perforation of a Meckel's secondary to a foreign body. We present a case of a perforated Meckel's diverticulum by a prawn head.

CASE REPORT

TD is a 42-year-old man who presented with a 3-day history of generalised abdominal pain. He described a sharp stabbing pain, gradual in onset and worsening intensity over the last few days. The pain did not radiate anywhere and was worse on movement- especially when walking and driving. He denied nausea, vomiting or altered bowel habits. He denied dysuria, increased urgency, or frequency. He had a colonoscopy one year prior to presentation for PR bleeding which was

unremarkable. He was otherwise fit and well, with no previous intra-abdominal surgery.

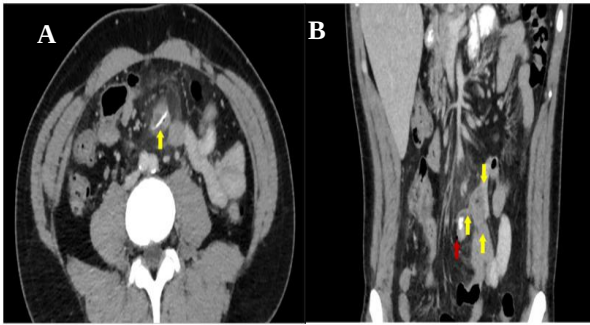


Figure 1: A) CT abdomen/pelvis axial view showing a foreign body (yellow arrow) within the small bowel. There is surrounding fat stranding with no evidence of perforation, on this slice it is difficult to appreciate that this is a Meckel's diverticulum, B) a coronal section showing a Meckel's diverticulum given the lumen communicating between adjacent loops of bowel (yellow arrow). At the edge/within of the bowel wall, locules of air can be seen suggesting a potential perforation (red arrow).

On presentation, his vitals were as follows: heart rate 76, respiratory rate 18, saturating at 98% on room air and temperature 37°C. On examination, his abdomen was not distended, was soft; he had localized tenderness on palpation with involuntary guarding of the right iliac fossa, left iliac fossa and suprapubic region with percussion tenderness.

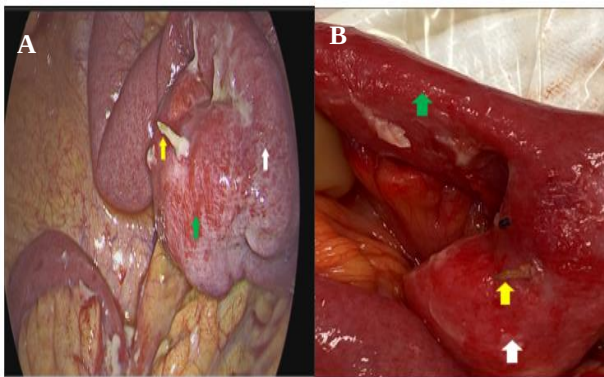


Figure 2: A) Laparoscopic view of the prawn haustra perforating the Meckel's diverticulum (yellow arrow). Furthermore, diverticulitis secondary to perforation (green arrow) and adjacent small bowel inflammation can be seen (green arrow), B) Meckel's diverticulum (white arrow) arising from the small bowel (green arrow) perforated by the rostrum of the prawn head (yellow arrow) after procedure converted to open.

On bloods, he had a white cell count of $10.9 \times 10^9/l$, neutrophils of $8.9 \times 10^9/l$, and C-reactive protein of 176 mg/l. A provisional diagnosis of appendicitis vs acute

diverticulitis was made, and a CT abdomen/pelvis was performed to clarify diagnosis. It revealed a foreign body within a Meckel's (Figure 1) with no evidence of perforation. On further history, he reported eating a prawn pancake three days prior- establishing a diagnosis of a possible foreign body injury secondary to a prawn head as this was the section of the prawn top potentially cause perforation. He underwent a diagnostic laparoscopy to assess for perforation. Intra-operatively, the omentum was wrapped around the small bowel and was bluntly dissected off, revealing a prawn rostrum perforating the Meckel's (Figures 2-3).

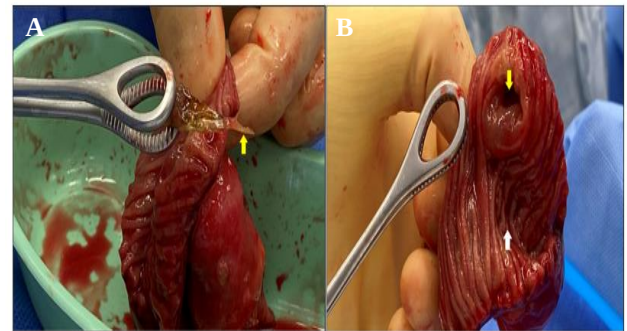


Figure 3: A) a close up view of a partially digested prawn head retrieved from the Meckel's diverticulum with the rostrum intact (yellow arrow), B) The specimen opened to show the lumen of the Meckel's diverticulum (yellow arrow). The wide base can be better appreciated in this photograph and further highlights why foreign bodies tend to get lodged into the diverticulum. Forester forceps adjacent for size reference.

This was converted to an open procedure as we were unable to safely assess if surrounding bowel was injured. He underwent a small bowel resection and was discharged home four days later. Histopathology report revealed a sharp body associated perforation of a MD with acute serositis. It contained heterotopic pancreatic tissue with focal gastric metaplasia and had no evidence of malignancy.

DISCUSSION

Perforation of a Meckel's commonly occurs due to diverticulitis or ulceration of mucosa from ectopic gastric mucosa. Perforation from an ingested foreign body is rare with only 300 cases reported in the literature, of which include wood splinters, batteries, pins/needles, batteries, chicken and fish bones.^{6,7} Proposed mechanisms for foreign body lodgment include disordered motility and wide based opening of the diverticulum, allowing foreign bodies to lodge inside the blind pouch and cause perforation.^{8,9} To the best of our knowledge, this is the first reported case of a perforated Meckel's secondary to a prawn head.

Pre-operative diagnosis of MD perforation is difficult as patients present with symptoms suggestive of appendicitis, diverticulitis, or small bowel perforation.^{10,11} Furthermore, patients often do not recall ingesting the foreign body, thus they are often diagnosed on imaging or intra-operatively.¹² In our case, this was not apparent until a CT was performed given our suspicion for diverticulitis. In all but two cases reported, the majority of foreign body perforation of MD have been diagnosed intra-operatively.^{13,14} A perforated Meckel's is a surgical emergency with the definitive treatment being diverticulectomy and bowel resection. This is often performed laparoscopically; however, the approach is tailored on a case-by-case basis as each technique has its merits. Diverticulectomy can be performed as long as the perforation is sufficiently far from the base, and bowel resection is indicated in cases of diverticulitis, bleeding, inflammation to surrounding bowel and perforation close to the base of the diverticulum.¹⁵ In our case, a diagnostic laparoscopy was performed to assess the extent of bowel injury from the prawn head, and subsequently proceeded to a lower midline laparotomy as we could not safely exclude injury of adjacent bowel. Furthermore, we performed a bowel resection as there was inflammation of the adjacent bowel.

CONCLUSION

Foreign body perforation of a Meckel's is quite rare and should be suspected in patients with an acute abdomen, especially in patients with symptoms suggestive of appendicitis. A combination of history, examination and imaging can help narrow the diagnosis. However, a thorough examination of the small bowel must be performed, especially if the appendix appears normal, to look for a perforated Meckel's.

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