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Case Report

Jejunal diverticulum perforation leading to extra intestinal faecolith formation: a case report

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ABSTRACT

A 54-year-old woman with a history of jejunal diverticulitis presented with vague abdominal pain and underwent a laparotomy for a suspected foreign body perforation based on CT imaging. Surprisingly, no foreign body was found, but rather a chronic jejunal diverticulum with perforation and early-stage faecolith formation within the contained site. This rare case challenges assumptions about jejunal diverticulitis management and suggests that premature faecolith formation can occur post-perforation. We proposed revising treatment strategies to consider conservative measures for stable patients with contained perforations, emphasizing accurate diagnosis and individualized management, and promoting further research to establish evidence-based guidelines specific to jejunal diverticulitis.

Keywords: Jejunal diverticulitis, Faecoltih, Perforation, Foreign body

INTRODUCTION

Jejunal perforation is a rare but life-threatening event, often necessitating urgent surgical management.[1] In contrast, contained perforations in small bowel diverticulitis in stable patients, akin to colonic diverticulitis, can often be managed with less invasive measures, utilising antibiotic therapy and interventional radiological procedures.[2,3]

Diverticulosis of the small bowel is relatively uncommon compared to its colonic counterpart, with a prevalence of less than 5% of the population, compared to colonic diverticulosis which affects >50% of individuals over 60 years of age.[4-6] Jejunal diverticulosis is even less encountered, with reports as low as 0.3% prevalence in the population.[7,8]

A small minority of patients with jejunal diverticulosis develop diverticulitis, signifying the infrequency that this condition is encountered by clinicians.[9-11] Although pain is a typical presenting symptom, vague complaints such as loss of appetite or nausea may be the primary cause of patient concern, and hence it is likely to go underdiagnosed in the acute setting unless the patient is of enough clinical concern to warrant additional investigation, usually imaging.[10-12]

As this condition is rarely encountered, its management is not well studied, and treatment guidelines are often extrapolated from colonic diverticulitis, which may be less than optimal. Similar to colonic diverticulitis, perforation is a feared complication and can cause increased morbidity and mortality.[13] Foreign bodies may be the cause of perforation through weakened diverticular walls, but equally responsible are repeated bouts of diverticulitis.[14]

We present a unique case in which a clinically stable patient was suspected of a jejunal perforation, incorrectly attributed to a plastic foreign body based on imaging. The perforation was a result of recurrent bouts of diverticulitis, with premature faecolith formation at the site of perforation, due to the established inflammatory environment. This case raises the uncertainty in

diagnosing and managing this condition. We hypothesis that invasive surgical management could have been avoided if additional literature on this condition and scenario existed.

CASE REPORT

History

A 54-year-old female presented with a 1-week history of generalized, vague, and cramp-like abdominal pain of mild intensity. The pain persisted despite over-the-counter analgesics (paracetamol and ibuprofen) and was exacerbated with movement, coughing, and jarring motions. An absence of fevers, diaphoresis, malaise, bowel alterations, and nausea were reported.

The medical history included small bowel diverticulitis managed with oral antibiotics 5 years prior, endometrial fibroids, and controlled type 2 diabetes mellitus. Initial consultation was with a general practitioner who, upon reviewing a CT scan, referred the patient to the hospital due to concerning imaging findings. The patient denied any history or possibility of foreign body ingestion.

Examination

The patient appeared comfortable and vital signs were within normal limits (BP- 110/80 mmHg, HR- 70, RR- 14 bpm, SpO_2- 97%, temperature- 37.4°C). Abdominal examination revealed primarily right-sided tenderness, discordant with CT findings, and a soft, non-peritonitic abdomen with no masses, hernias, or other disease stigmata.

Investigations

A CT scan reported by a radiologist identified a foreign body in the left mid-abdomen with surrounding inflammation suggestive of perforation (Figure 1). The foreign body, suspected to be plastic due to its absence on scout view (Figure 2 and 4), was contained without evidence of free air. Comparison with a CT scan from 5 years prior during the previous episode of jejunal diverticulitis showed the presence of disease at a similar location (Figure 3).

Notably, the earlier scan reported two acutely inflamed small bowel diverticula in the same area but with no perforation or collection. Laboratory evaluation did not support an inflammatory or infectious process, with white cell count and CRP within normal ranges (WBC- 8×10^9/l, CRP- 13 mg/l). Additionally, haemoglobin, platelets, and other biochemistry markers were within normal limits, indicating no multi-organ dysfunction.

Histopathology

The resected segment revealed two distinct regions. Firstly, a smaller, uncomplicated diverticulum exhibited a preserved muscularis propria layer, consistent with a congenital uninflamed Meckel's diverticulum. This finding was reassuring and was not suspected to contribute to the patient's presentation.

In contrast, the larger segment displayed features of chronic diverticulitis with perforation and associated peritonitis, with an attenuated muscularis propria. Notably, despite initial suspicions, no evidence of a foreign body was identified.

A focus of mixed calcification and faecal matter was observed surrounding the perforation site, suggesting chronic inflammation and the development of a faecolith in its initial stages. Importantly, the microscopic examination confirmed the absence of dysplasia or malignancy, and the resection margins of both fragments were free of any suspicious findings.

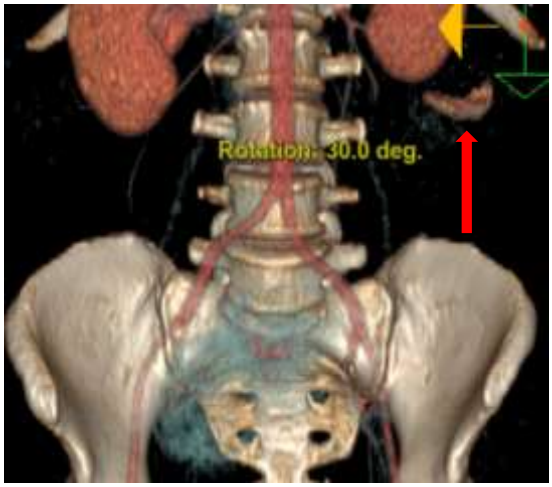

Figure 1: Digitally created CT imaging showing suspected foreign body (red arrow).

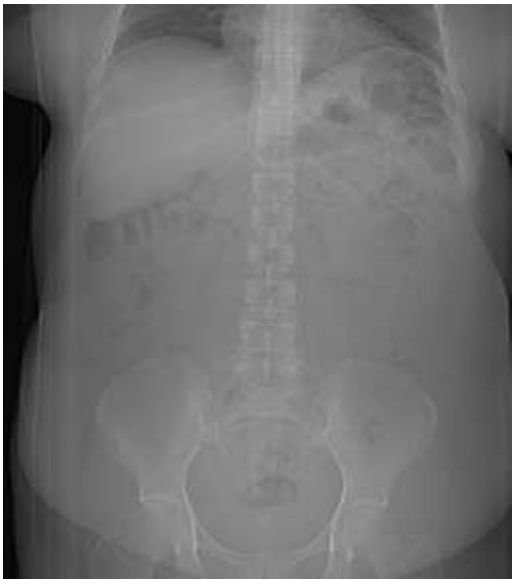

Figure 2: Scout film showing no evidence of a radiopaque foreign body.

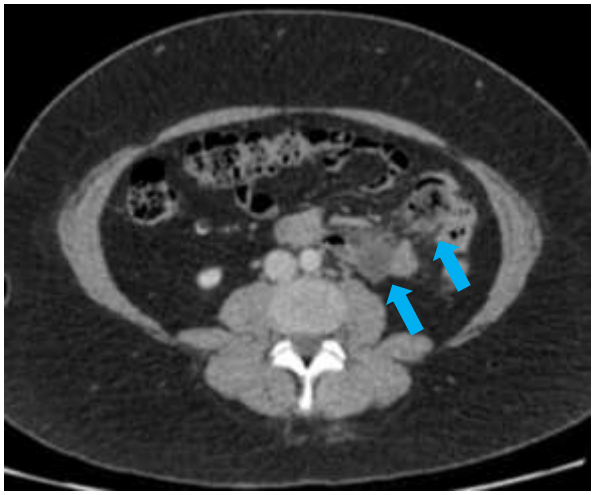

Figure 3: CT axial imaging showing simple jejunal diverticulitis from 5 years prior (blue arrows).

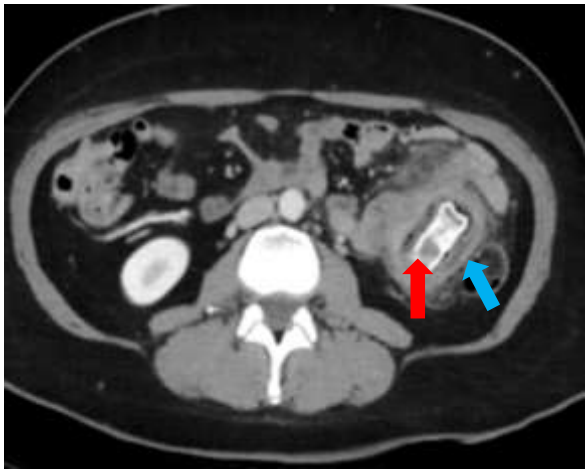

Figure 4: CT axial image showing suspected foreign body (red arrow) and surrounding contained perforated diverticulum (blue arrow).

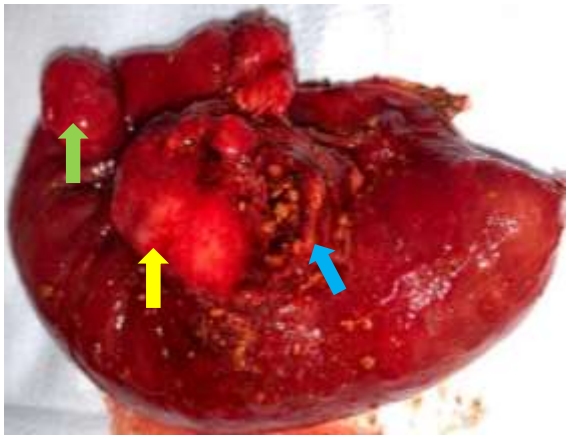

Figure 5: Resected specimen, Meckel's diverticulum (green arrow), inspissated faecal contents and site of presumed foreign body (yellow arrow), and perforated diverticulum (blue arrow).

DISCUSSION

Jejunal diverticulitis, though recognised for decades, remains a relatively enigmatic entity compared to its colonic counterpart. This report presents a unique case that expands our understanding of this rare condition, challenging established paradigms and highlighting the limitations of extrapolating treatment strategies from colonic diverticulitis. While several cases document faecolith-induced small bowel perforations, our case stands out by revealing a previously unreported sequence: perforation preceding the formation of an extraintestinal faecolith within the contained site.[15-17] The prevalence of jejunal diverticulosis is reported in less than two percent of the population based on a combination of various radiological and post mortem studies, however all of which are low power and hence the true prevalence may vary greatly.[18,19] While both jejunal and colonic diverticulosis involve the formation of small pouches in the intestinal wall, their pathophysiology's differ in several keyways. Colonic diverticulosis is believed to stem primarily from increased pressure within the colon, often due to low-fibre diets, muscle weakness, and vascular compromise.[20] In contrast, the exact causes of jejunal diverticulosis remain less clear, but potential factors include congenital abnormalities, chronic inflammation, and dyskinetic motility disorders.[21]

Faecolith formation typically resembles a slow, intricate solidification process. Hepatic bile acids undergo bacterial transformation which are essential for faecolith production.[22] This in combination with prolonged colonic transit time, often due to constipation or strictures, provides the ideal environment for these derivatives to aggregate and harden.[22] With respect to the small bowel, inflammatory conditions or localized enteritis can further promote stasis and calcification. Nidus formation by ingested seeds or medication tablets can also result in faecolith formation, with an increased likelihood of these lodging in diverticular.[22] The process of faecolith formation usually unfolds over weeks or months, although specific studies are lacking, which contrasts with our case in where we see progressive formation over a one-week period. The proximal nature site of faecolith formation and the rate of formation makes us suspect that a recurrent jejunal diverticulitis process resulted in the perforation event, and the ensuing inflammation along with enteral content stagnation enabled the ideal conditions for the development of a faecolith. Our experience reinforces the need for individualized management based on specific findings. While contained perforations in the both colon and jejunum often respond well to antibiotics and dietary modifications, our patient's suspected foreign body necessitated surgical intervention.[2,3] Furthermore, the rapid faecolith formation within the perforation, likely facilitated by the inflammatory environment, suggests that antibiotic timing may not only influence perforation prevention but also faecolith development. Given the concern for a foreign body causing ongoing inflammation and potential complications we opted for surgical

management. It is unclear as to whether the patient could have been successfully treated with antibiotic therapy, however we suspect that a trial of intravenous antibiotics may have been warranted when being reviewed retrospectively.

CONCLUSION

This case report highlights the essential role of meticulous CT interpretation and individualized management strategies in jejunal diverticulitis. Expanding our comprehension of this pathology through ongoing case reporting can refine both diagnostic and therapeutic algorithms, ultimately optimizing patient outcomes. Increased documentation of similar presentations of misdiagnosed foreign body perforation and primitive faecolith formation also paves the way for standardized treatment pathways in these particular cases. Large-scale studies analyzing typical cases of jejunal diverticulitis would enable us to move beyond extrapolation from colonic diverticulitis and establish evidence-based treatment guidelines specific to pathology, a crucial step in enhancing care for this rare yet potentially life-threatening condition.

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