Perforated Duodenal Diverticulum and Enterolith Formation Leading to Small Bowel Obstruction

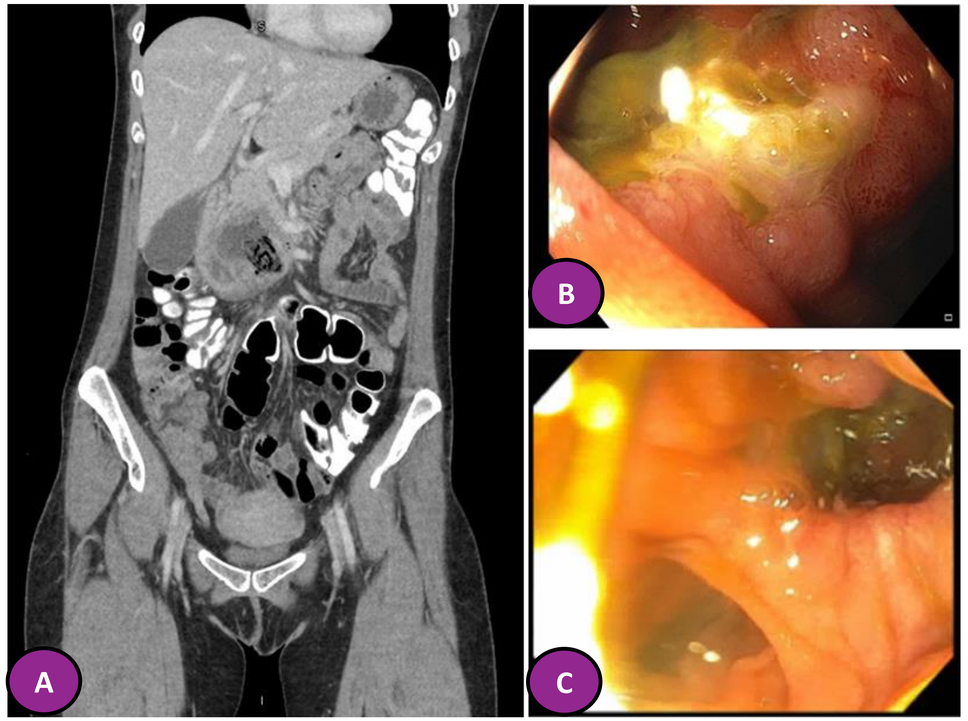
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INTRODUCTION

- Duodenal diverticula (DD) are common and are seen in up to 20% of the healthy population. Most DD are asymptomatic.
- Occasionally (1-5% of cases), DD become symptomatic due to gastroduodenal, biliary, or pancreatic obstruction; hemorrhage; or perforation, with the latter having a mortality of up to 30% [1]
- Rarely, the presence of DD can lead to enterolith formation within the DD lumen and subsequent perforation and abscess formation. Migrated enteroliths can lead to subsequent distal small bowel obstruction (SBO) (termed “enterolith ileus”).

CASE DESCRIPTION

- A 43-year-old female presented with one day of sharp epigastric pain with bilious emesis and subjective chills. Her exam demonstrated moderate RUQ tenderness but a negative Murphy’s sign. Workup showed the following:
  - Abdominal CT (day 1): A 2.5 x 4.3 x 2.5 cm duodenal outpouching with internal fecalization/necrosis and significant surrounding inflammation, representing an inflamed duodenal diverticulum versus a contained perforated duodenal ulcer (**Figure A**)
  - Endoscopic ultrasound (day 3): A 30mm ulcerated, friable diverticulum in 3rd portion of duodenum with a 10mm opening and purulent-appearing discharge. Contents were heterogenous and of mixed echogenicity (**Figures B, C**). DD was not amenable to drainage.
- Conservative management with antibiotics was recommended and the patient improved. 2 days later, the patient developed worsening pain and vomiting. A repeat CT showed interval improvement of the DD but now with a new small SBO in right lower quadrant (RLQ).
  - The patient underwent laparoscopy, during which a firm enterolith was identified at the transition point seen on CT. This was removed via a longitudinal enterotomy. There was ischemic discoloration of the jejunal segment involved and, given concern for breakdown of the suture line, it was partially resected with primary anastomosis.
- The patient did well post-operatively and was discharged on POD7, concluding her 21-day hospitalization.



DISCUSSION

- DD can be complicated by enterolith formation within the diverticulum lumen, leading to local complications as duodenal diverticulitis and perforation and to more distal complications like bowel obstruction when the enterolith migrates (as seen in this case of “enterolith ileus”).
  - Traditional management for penetrating duodenal diverticulitis has been surgical, though conservative management or endoscopic closure has been supported more recently [1-2]
- When signs or symptoms of a SBO develop in patients with known DD, consider obstruction of the bowel lumen due to a migrated enterolith.
  - While conservative measures like nasogastric decompression, fluid resuscitation, and antisecretory medications could be considered to facilitate spontaneous resolution of the obstructing enterolith, surgical intervention should not be delayed if signs or symptoms of a complicated obstruction are noted on exam or imaging.
- An evidence-based treatment algorithm has previously been proposed for duodenal enteroliths (**Figure D**) but decisions need to be based on individual case attributes for complications such as ileus and perforation [3]

REFERENCES

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2. Schnueriger B, Vorburger SA, Banz VM, at al. Diagnosis and management of the symptomatic duodenal diverticulum: a case series and a short review of the literature. *J Gastrointest Surg*. 2008;12(9):1571-1576.
3. Ansari D, Torén W, Lindberg S, et al. Diagnosis and management of duodenal perforations: a narrative review. *Scand J Gastroenterol*. 2019;54(8):939-944.

D

Adapted from Ansari et al. [3]

Duodenal Enterolith

Associated Perforation

Minor Perforation

❖ **Surgical Treatment:**
- Simple Repair

❖ **Endoscopic Treatment:**
- Perforation size ≤1cm: TTSC
- Perforation size 1-3cm: OTSC, endoloop with clips or SEMS

Major Perforation

❖ **Surgical Treatment:**
- Duodenoduodenostomy
- Roux en Y duodenojejunostomy
- Antrectomy and gastrojejunostomy (Billroth II)
- Pancreaticoduodenectomy
- Tube duodenostomy

❖ **Endoscopic Treatment:**
- SEMS

No or Contained Perforation

Stable patient

❖ **Conservative Management:**
- NPO
- IV fluids
- IV antibiotics
- IV proton pump inhibitors
- Nasogastric tube
- H. Pylori eradication
- Close monitoring

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