

Successful management of perforated duodenal diverticulum by use of endoscopic drainage

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Duodenal diverticulum is the most common type of small-bowel diverticulum, and adverse events involving a perforated duodenal diverticulum historically have required operative management.¹ We present a case of perforated duodenal diverticulum, which was managed with endoscopic drainage, and propose this as an alternative to operative management.

METHODS AND RESULTS

A 75-year-old woman with a history of gastric ulcers, reflux, Barrett's esophagus, and a complex surgical history involving previous gastroenterostomy, fundoplication, cholecystectomy, appendectomy, and hysterectomy, presented with a 4-day history of generalized crampy abdominal pain, anorexia, and vomiting. On initial examination she was tachycardic with a pulse rate of 108 beats per minute, but afebrile at 36.7°C, and clinically well with a blood pressure of 130/90 mm Hg, respiratory rate of 19 breaths per minute, and oxygen saturation of 96% in room air. Her abdomen was soft, mildly distended, and tender over the epigastrium. Her blood biochemistry studies revealed a mild leukocytosis of 11.14×10^9 cells/L, lactate dehydrogenase of 1.4 mmol/L, and C-reactive protein of 337 mg/L. Her electrolytes and liver functions were in the normal range. CT of her abdomen was suggestive of a perforated duodenal diverticulum (Fig. 1). The patient's pain did not improve with 2 days of bowel rest and intravenous antibiotics; therefore, endoscopy was performed (Video 1, available online at www.VideoGIE.org).

Endoscopy identified a large collection of pus in the second part of the duodenum with a necrotic and inflamed duodenal diverticulum containing a foreign body (Fig. 2-3). The esophagus and stomach were normal, and the gastrojejunal anastomosis was functioning well. The foreign body in the diverticulum was removed, the abscess cavity was washed out, and a 7F, 7-cm double-pigtail drain was internally placed by endoscopy to drain the abscess (Fig. 3-6). There were no postprocedural adverse events. The patient was given a fluid diet the next day. Repeated CT 1 month later showed the drain in a satisfactory position within the duodenal diverticulum, with no evidence of

Written transcript of the video audio is available online at www.VideoGIE.org.



Figure 1. Computed tomography (axial view) showing a duodenal diverticular abscess in the second part of the duodenum as represented by the fluid and gas collection with localized inflammation (*green arrow*).

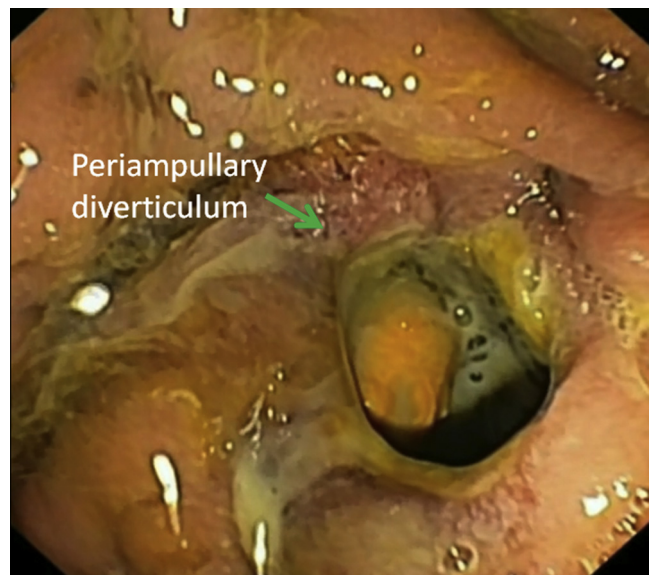


Figure 2. Endoscopic view of periampullary diverticulum (*green arrow*).

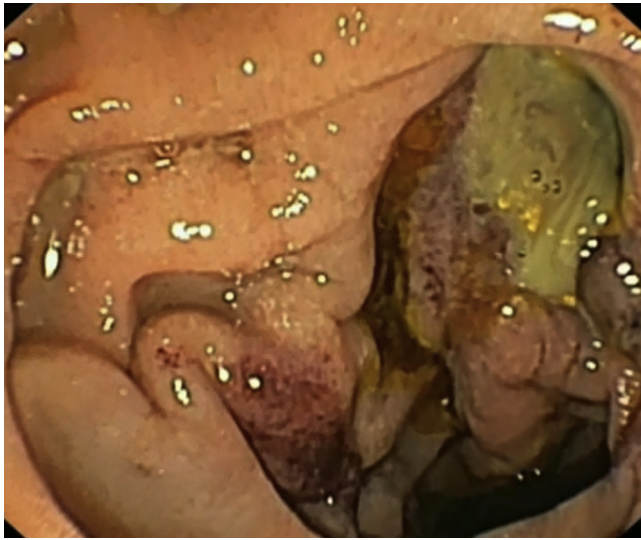


Figure 3. Endoscopic image showing the abscess draining internally into duodenum.

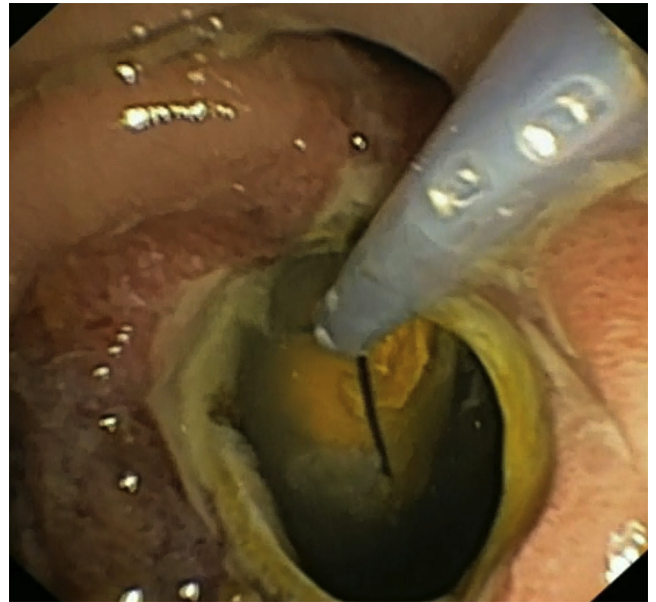


Figure 5. Endoscopic image showing a foreign body being removed from the diverticulum with a snare.

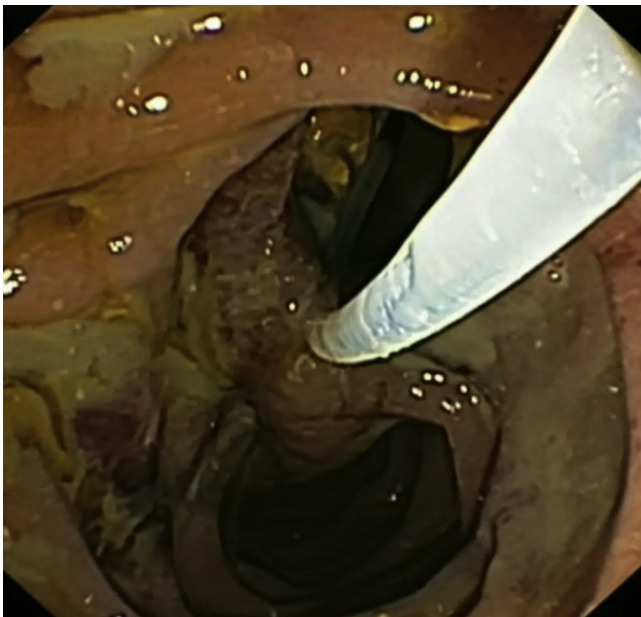


Figure 4. Endoscopic image showing a washout of the diverticulum with saline.

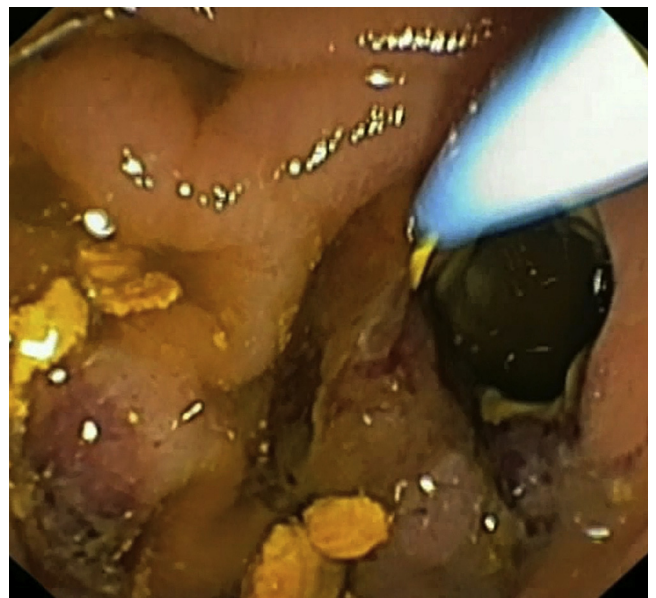


Figure 6. Endoscopic image showing a double pigtail stent being placed into the diverticulum along a guidewire.

residual collection (Fig. 7). The drain was removed 5 weeks after insertion (Fig 8), and the patient remained well on follow-up 3 months later.

DISCUSSION

Duodenal diverticula occur in up to 22% of autopsy findings.¹ The majority occur along the pancreatic or mesenteric border of the second part of the duodenum.² Adverse events are rare and include perforation,

hemorrhage, and obstruction.³ Common causes of perforation include diverticulitis, enterolithiasis, ulceration, increased intraluminal pressure, blunt abdominal trauma, and gallstones or foreign bodies.² CT is the diagnostic tool of choice; the characteristic findings are fluid and gas collection.⁴ An upper-GI bowel series may supplement CT in difficult diagnostic cases.⁵

The mortality rate from perforated duodenal diverticulum in recent reports is around 8%.¹ Patients in clinically unstable condition with peritonitis require



Figure 7. Computed tomography (axial view) showing a drain in position with resolution of the collection in and around the duodenal diverticulum (green arrow).

operative treatment⁶⁻⁸; however, patients in clinically stable condition sometimes also receive operative management.^{3,9,10} Several case reports have shown successful nonoperative treatment of patients' condition by use of bowel rest, intravenous antibiotics, and, in some cases, percutaneous drainage.^{1,11,12} A recent report by Talbot et al¹³ showed that minimally invasive endoscopic techniques for drainage of perforations, leaks, and fistulae are a successful strategy for the management of intraabdominal pathologic conditions that would otherwise require surgery. In their study, all of their patients had uncomplicated recoveries without recurrence of leaks, and they tolerated fluid diets after drain placement. We adopted this technique for our drainage of a perforated duodenal diverticulum.

In conclusion, perforated duodenal diverticulum is a rare but important consideration in patients with epigastric tenderness. Historically, these have generally been managed operatively. We propose a minimally invasive alternative to surgical exploration with the use of endoscopic drainage of the perforation in patients whose conditions are clinically stable.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

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Figure 8. Endoscopic view showing resolution of the diverticular abscess after removal of the double pigtail stent.

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