

Endoscopic suturing of a large type I duodenal perforation

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An 83-year-old man with an 18-month history of a previously assumed benign duodenal stricture and relapsing pancreatitis was transferred from an outside hospital with new-onset obstructive jaundice. His medical history included heart failure, atrial fibrillation for which warfarin was prescribed, and a pacemaker. CT of the abdomen demonstrated biliary and pancreatic duct dilation, multiple peripancreatic lymph nodes, and a possible small lesion in the periampullary area (Fig. 1). EUS demonstrated thickening of the distal common bile duct without an obvious mass to biopsy when observed from the duodenal bulb (Fig. 2). Because the diameter of the duodenal stenosis at the turn from the bulb to the second portion of the duodenum was about 3 mm to 4 mm, the echoendoscope could not pass through the stricture; therefore, the echoendoscope was switched to a standard gastroscope, but that too was unable to traverse the stricture. The duodenoscope was reinserted with intention to dilate the stricture and to perform ERCP. Dilatation of the duodenal stricture to 15 mm (Fig. 3) resulted in a local perforation (Fig. 4).

clip, and an endoscopic suturing device was used to close the defect. Three sutures were placed to approximate the edges of the perforation completely. Contrast medium was injected and the absence of extravasation confirmed closure. Biopsy specimens of the stricture were taken. A

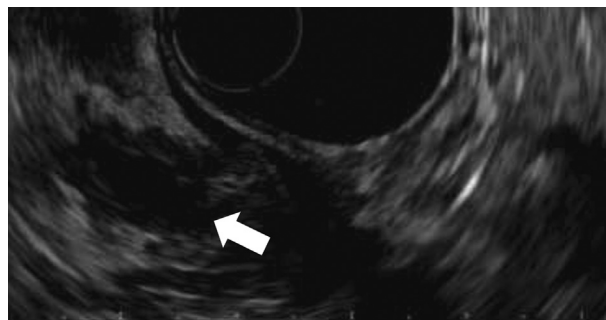


Figure 2. EUS view showing thickening of the distal common bile duct without distinct mass (arrow).

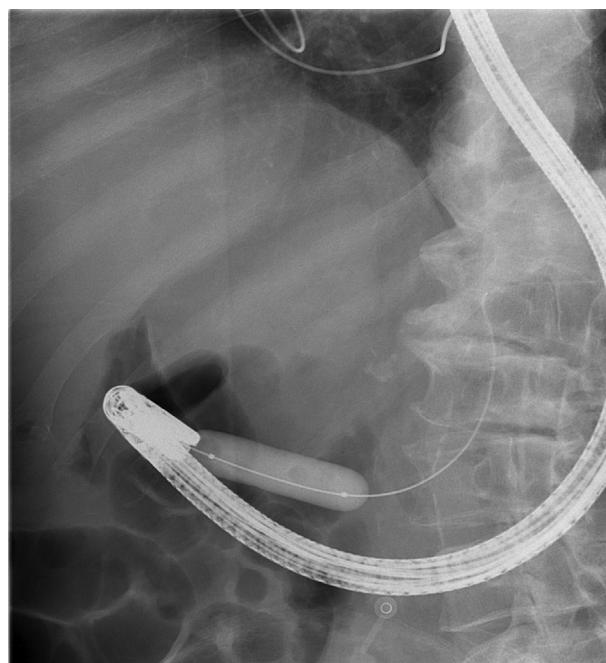


Figure 3. Attempt to dilate the duodenal stricture with controlled radial expansion balloon.

PROCEDURE

The duodenoscope was once again exchanged for an upper endoscope, demonstrating a perforation measuring at least 2 cm in diameter on the lateral wall of the duodenum. It was too large to close with an over-the scope

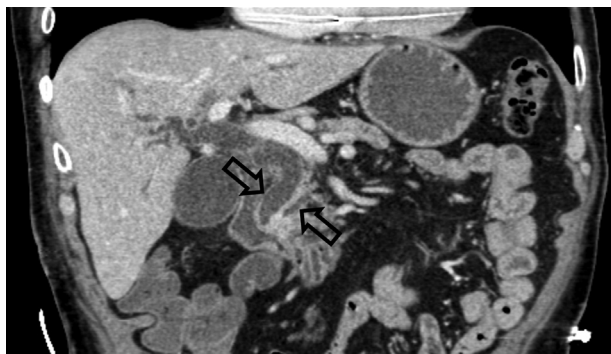


Figure 1. CT view showing dilatation of both the bile and pancreatic ducts ("double-duct sign," open arrows) with a possible lesion in the periampullary area.

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

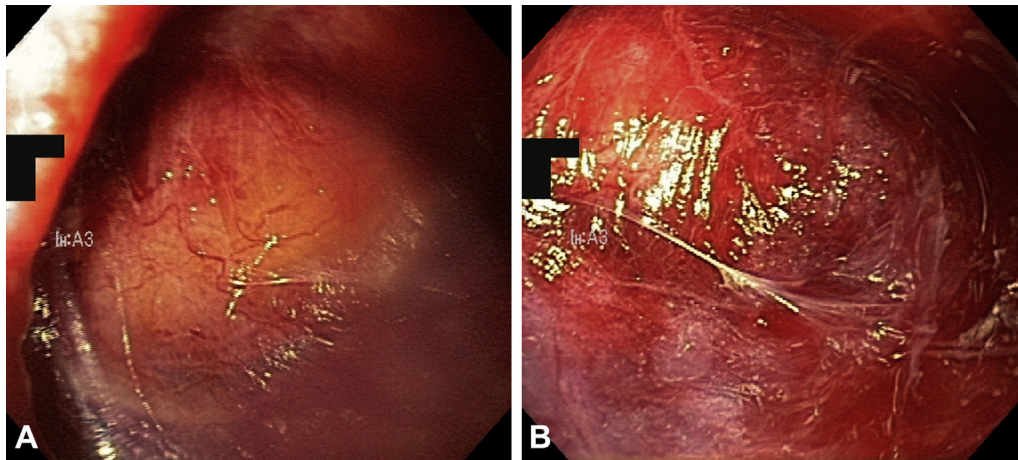


Figure 4. (A, B) Peritoneal fat observed during advancement of the endoscope, consistent with full-thickness perforation.

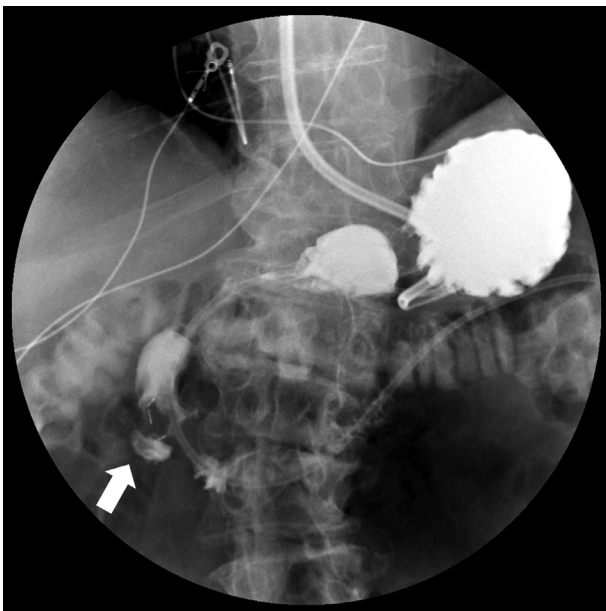


Figure 5. A small outpouching (*arrow*) noted near the suture site on upper-GI series.

nasogastrojejunal tube was placed, and the procedure was terminated ([Video 1](#), available online at www.VideoGIE.org).

There are several treatment options for managing a perforation in the GI tract: surgery, conservative management, and endoscopic therapy. Regarding endoscopic therapy, fibrin glue, metal stents, endoclips, over-the-scope-clips, and a detachable snare have potential applications depending on the location and size of the perforation and on the expertise of the endoscopist available at the institution.^{1,2} Fibrin glue and endoclips (or hemoclips) can be used when the perforation is small. However, when the perforation is large, a detachable snare can be applied along with endoclips. With the advancement of endoscopic devices we have another option for



Figure 6. Free air around the perforation site without substantial fluid collection.

closing the perforation, which is the suture device used in the present case.³

POSTPROCEDURE CARE AND OUTCOME

The patient experienced no abdominal pain or fever. His white blood cell count remained normal. He was treated with antibiotics and nothing by mouth for 3 days, beginning intraprocedurally. An upper-GI series the following day showed a small outpouching at the level of the most distal suture but without frank leakage ([Fig. 5](#)). A CT scan showed some free air without a fluid collection ([Fig. 6](#)). Analysis of biopsy specimens demonstrated a well-differentiated adenocarcinoma of the duodenum. The repair was done before there was a definitive diagnosis, but once malignancy was histologically defined, we recommended definitive surgery.

Nevertheless, the patient elected to undergo a Roux-en-Y hepaticojejunostomy and gastrojejunostomy instead of a pancreaticoduodenectomy because of his underlying cardiac comorbidities and his wish not to have more extensive surgery. The duodenal repair was seen to be intact when surgery was performed 7 days later, and the sutures were seen at the site of the full-thickness repair. The patient is still alive 9 months after the procedure.

DISCLOSURE

Dr Irani is the recipient of a remittance to clinic from Boston Scientific. All other authors disclosed no financial relationships relevant to this publication.

Abbreviation: CRE, controlled radial expansion.

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