



Endoscopic management of a recalcitrant anastomotic bile leak after pancreaticoduodenectomy

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A 64-year-old woman with a surgical history of pylorus-preserving pancreaticoduodenectomy for pancreatic adenocarcinoma presented for endoscopic management of postoperative anastomotic bile leak and suspected stricture at hepaticojejunostomy, which persisted despite surgical and percutaneous intervention.

At the time of her pancreaticoduodenectomy, she was noted to have intraoperative bile leakage from the newly constructed hepaticojejunostomy anastomosis. Despite placement of additional sutures at the anastomosis, there was continued bile staining, so the hepaticojejunostomy was revised intraoperatively by cutting back the common hepatic duct to healthy tissue. A T tube was also inserted past the anastomosis and brought through the jejunum for decompression. Surgical pathologic examination showed a pT2N1 pancreatic adenocarcinoma with negative margins. Postoperatively, bilious output developed from the intra-abdominal drain, which was concerning for anastomotic leak. However,

a T tube cholangiogram was negative for any leak, and a CT scan of the abdomen/pelvis on postoperative day 6 showed only a small amount of poorly organized fluid along the operative fossa (Fig. 1).

On outpatient follow-up after her surgery, the patient continued to have bilious drainage from her intra-abdominal drains despite T tube decompression, and she was referred to interventional radiology for percutaneous transhepatic cholangiography. A cholangiogram demonstrated a significant leak from the anastomosis into a new subhepatic fluid collection (Fig. 2). A 10.2F internal-external drainage catheter was placed.

On subsequent catheter change, it was also noted that the biliary catheter was actually placed into a fluid collection/biloma adjacent to the small bowel, not across the hepaticojejunostomy. Two more attempts at internalization of the percutaneous biliary catheter were unsuccessful because no flow of contrast material from the bile duct to the jejunal limb could be identified (Fig. 3). A follow-up CT scan showed the percutaneous catheter within the intrahepatic ducts and a dislodged pancreatic stent from the pancreaticojejunostomy (Fig. 4). On the basis of



Figure 1. Postoperative CT scan demonstrating fluid in the operative fossa.



Figure 2. Percutaneous cholangiogram demonstrating leak.



Figure 3. Percutaneous cholangiogram demonstrating lack of flow into the jejunum.

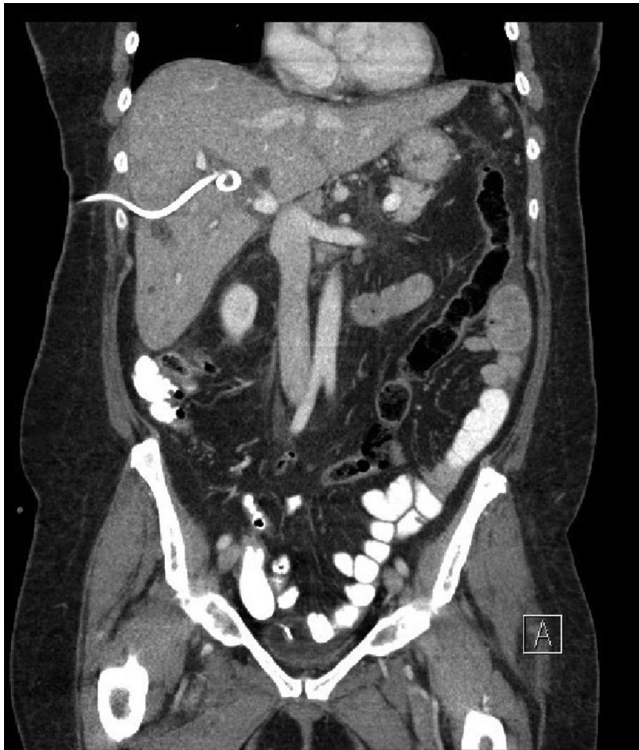


Figure 4. CT scan demonstrating coiling of the percutaneous drain within the biliary tree.

the cholangiogram and CT imaging, a stricture at the hepaticojejunostomy was suspected.

Her course was also complicated by episodes of cholangitis requiring hospitalization and delay in her adjuvant chemotherapy. Given the failure of surgical and percutaneous interventions to manage the persistent anastomotic leak and to evaluate for stricture, ERCP was performed to attempt transhepatic drainage with placement of an internal biliary stent. An adult colonoscope was successfully advanced to the hepaticojejunostomy, which appeared widely patent. The migrated pancreatic duct stent was seen protruding into the left side of the main hepatic duct (Fig. 5). This was removed with a

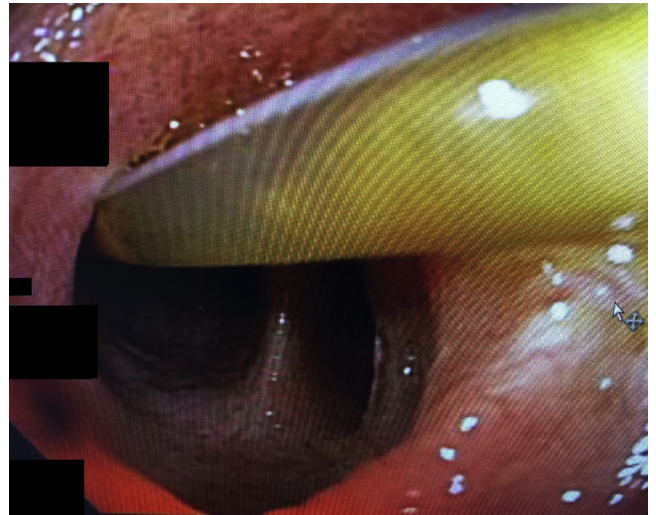


Figure 5. Patent hepaticojejunostomy with migrated pancreatic duct stent.



Figure 6. Contrast material injected through the percutaneous drain does not flow into the jejunum.

rat-toothed forceps. Selective cannulation of the bile ducts with cholangiogram was performed. The left side of the hepatic duct was draining well. In addition, injection of contrast material through the existing external percutaneous drain in the right side of the hepatic duct confirmed complete distal occlusion of the duct without any passage of contrast material into the jejunum (Fig. 6). Careful endoscopic examination of



Figure 7. Anterograde advancement of guidewire alongside percutaneous drain.

the area of the anastomosis revealed sutures located superior to the hepaticojejunostomy. A 0.018-inch hydrophilic wire was advanced anterograde alongside the external drain under fluoroscopic guidance (Fig. 7). This could not be passed into the small bowel, but advancement of the wire resulted in a bulge in the mucosa seen endoscopically in the area of sutures just superior to the hepaticojejunostomy, confirming the diagnosis of inadvertent surgical closure of the right system. To gain access to the right biliary system, a choledochojejunostomy was created by use of a needle-knife to make an incision in the area of the bulge created by the antegrade passage of a wire through the percutaneous tract. Afterward, the wire was able to be passed through the incision into the small bowel, grasped with a rat-toothed forceps, and pulled through the endoscope. This enabled a 10-mm x 4-cm fully covered metal biliary stent to be successfully deployed into the right side of the hepatic duct across the newly created hepaticojejunostomy (Fig. 8). A balloon occlusion cholangiogram through the right hepatic duct stent was now able to opacify the entire right hepatic system, and the external drain was removed at the conclusion of the ERCP procedure. The patient was able to proceed with adjuvant chemotherapy as planned. The metal

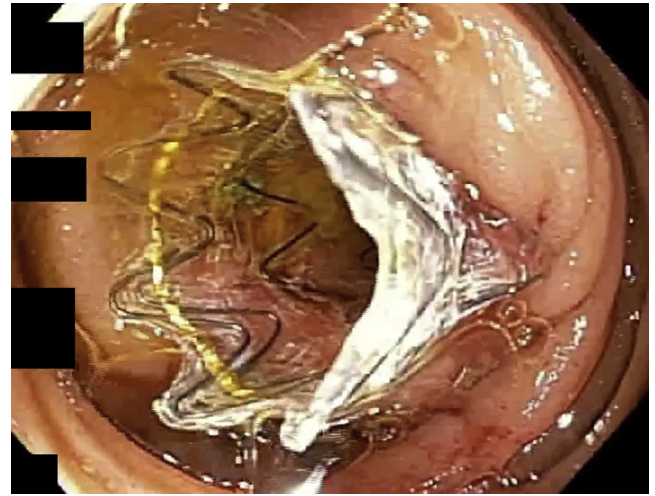


Figure 8. Successfully deployed fully covered metal biliary stent.

biliary stent was removed endoscopically 6 weeks after the initial procedure, demonstrating a widely patent anastomosis.

In this case, we report the endoscopic diagnosis and treatment of an iatrogenic biliary stricture leading to persistent anastomotic leak after pancreaticoduodenectomy (Video 1, available online at www.VideoGIE.org). Anterograde advancement of a guidewire alongside the percutaneous drain was used to guide endoscopic choledochojejunostomy. Instead of ERCP, an anterograde cholangioscope through the percutaneous tract could have been considered in this case. However, this would have required interventional radiology assistance for removal and possible reinsertion of the percutaneous catheter in the event of a failed endoscopy. Because the procedure was performed without interventional radiology assistance, the percutaneous catheter was left in situ until retrograde access was secured.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

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