



Endoscopic nasobiliary drainage tube placement through a periampullary perforation for management of intestinal leak and necrotizing pancreatitis

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Periampullary perforation has a high mortality rate.^{1,2} Endoscopic management, including a biliary stent placement into the common bile duct (CBD) and hemostatic clips, can treat the periampullary perforation.^{3,4} However, it can be difficult to close the perforation and prevent the intestinal juice leakage in the case of the perforation with severe inflammation.

A 66-year-old man with CBD stones (CBDS) after Billroth-II reconstruction for gastric ulcer presented with abdominal pain. He underwent ERCP for removal of the CBDS with endoscopic papillary balloon dilation (EPBD). All the CBDS were removed after EPBD; however, the periampullary membrane seemed to become thin and weak (Fig. 1). A CT scan performed 1 day after the ERCP did not detect a perforation; however, post-ERCP pancreatitis (PEP) developed (Fig. 2). PEP was treated conservatively with a CT scan follow-up. Twenty-five days after the initial ERCP, free air was detected in the acute necrotic collection (ANC) (Fig. 3). The periampullary perforation was detected by endoscopic findings, and the delayed perforation was considered to have occurred because of PEP from the weakened periampullary membrane. The hemostatic clip closing was not possible because of severe inflammation, so a 10-mm bore-size covered self-expandable metallic stent (CSEMS) (Niti-S; Teawoong, Seoul, Korea) was placed in the CBD for covering the perforation. However, intestinal juice leakage could not be controlled. Thirty days after the initial ERCP, we changed it to a 12-mm bore-size

CSEMS (HILZO; BCM Co, Seoul, Korea), and a 6F endoscopic nasobiliary drainage (ENBD) tube (NB-Braid; Piolax, Yokohama, Japan) was inserted through the perforation for suctioning out the leaked intestinal juice (Fig. 4; Video 1, available online at www.giejournal.org). After 32 days, endoscopic necrosectomy (EN) via a percutaneous drain was planned. A percutaneous transhepatic biliary drainage (PTBD) tube was inserted into the ANC from the lower part of the liver using ultrasound and fluoroscope imaging, followed by an overtube insertion. EN was performed via this overtube. During EN, the ENBD tube was detected and became an indicator of the portal vein and CBD, which helped avoiding collision with them (Fig. 5) and allowed for finding the perforated hole. The contrast medium from the endoscope did not flow into the intestine as shown by fluoroscopic findings. After EN, a 10F PTBD tube was placed for ANC drainage. After 59 days, the CT findings showed a decrease in the ANC size. The contrast medium from the ENBD tube did not flow into the intestine; thereafter, the ENBD and PTBD tubes were removed. After 119 days, the ANC had almost disappeared (Fig. 6A). The CSEMS was removed after confirming the complete closure of the periampullary perforation (Fig. 6B). No adverse events related to the perforation treatment and no relapse of ANC after more than 1 year of follow-ups were reported.

EPBD is a risk factor for PEP,⁵ and periampullary perforation is considered to occur because of PEP from the weakened periampullary membrane. While EPBD was performed, it was necessary to carefully perform measures such as adding endoscopic sphincterotomy.⁶ The CSEMS placement was recommended for the periampullary perforation treatment.^{7,8} In this case, the perforation was completely closed after changing to the 12-mm from the 10-mm bore-size CSEMS (Fig. 4). The larger bore-size CSEMS was better for covering the perforation. In addition, inserting an ENBD tube through the perforation is suitable as it suctioning out the leaked intestinal juice and can become an indicator for avoiding the CBD and portal vein during EN. A small perforation may appear after the ENBD tube removal, which the CSEMS can cover; therefore, the CSEMS should be removed a few months after the ENBD tube removal to avoid leakage of the intestinal juice from the small perforation.

Abbreviations: ANC, acute necrotic collection; CBD, common bile duct; CBDS, common bile duct stones; CSEMS, covered self-expandable metallic stent; ENBD, endoscopic nasobiliary drainage; EN, endoscopic necrosectomy; EPBD, endoscopic papillary balloon dilation; PEP, post-ERCP pancreatitis; PTBD, percutaneous transhepatic biliary drainage.

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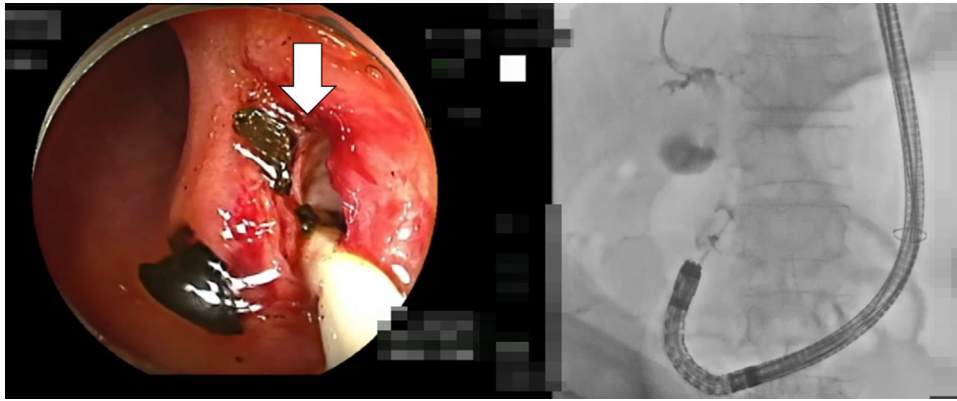


Figure 1. The periampullary membrane became thin and weak after endoscopic papillary balloon dilation.

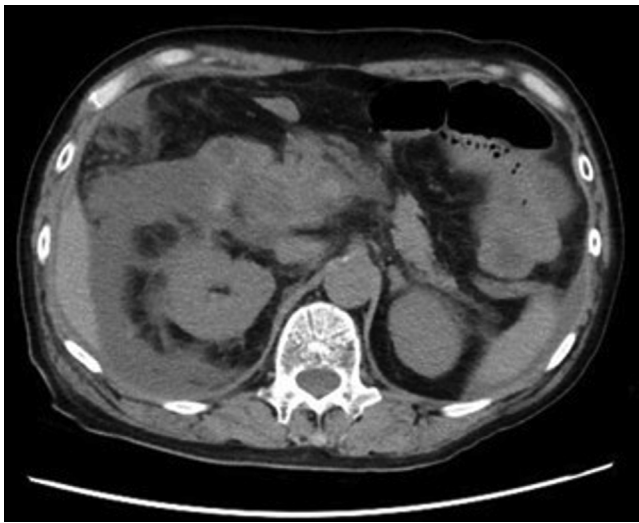


Figure 2. CT scan performed 1 day after ERCP did not detect the perforation; however, post-ERCP pancreatitis developed.



Figure 3. Contrast-enhanced CT scan showing free air in the acute necrotic collection cavity (*arrow*).

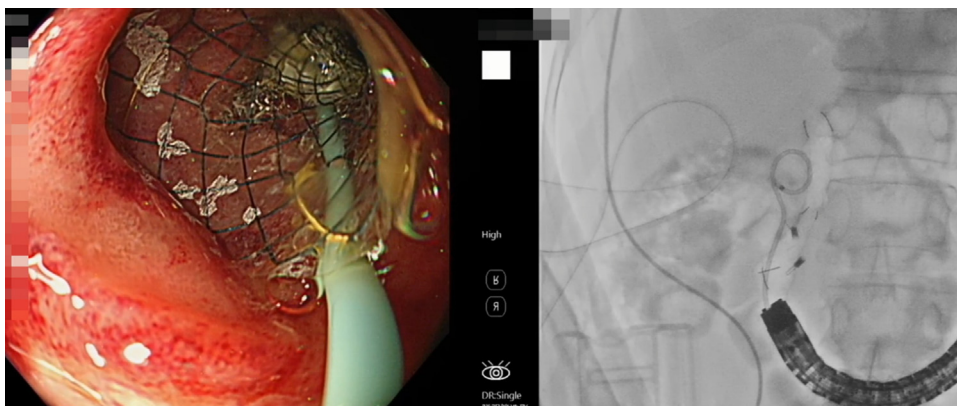


Figure 4. A 6F endoscopic nasobiliary drainage tube is inserted through the perforation after the covered self-expandable metallic stent was placed in the common bile duct.

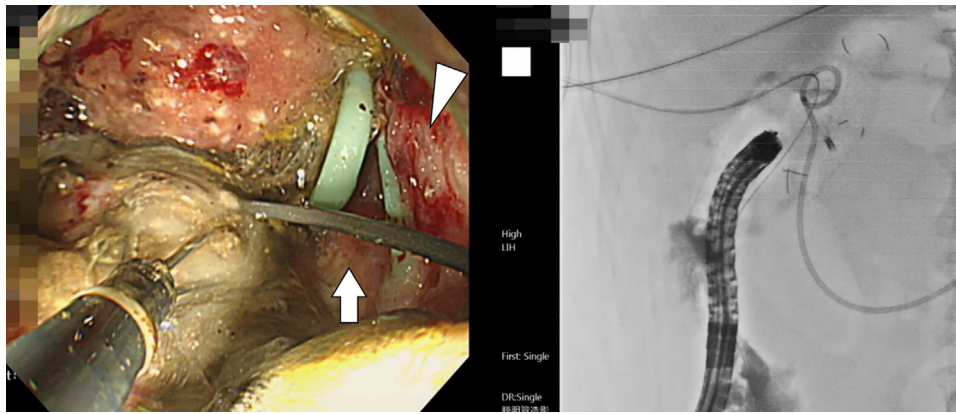


Figure 5. Endoscopic nasobiliary drainage tube is detected during endoscopic necrosectomy and acts as an indicator of the portal vein (*arrow*) and common bile duct (*arrowhead*).

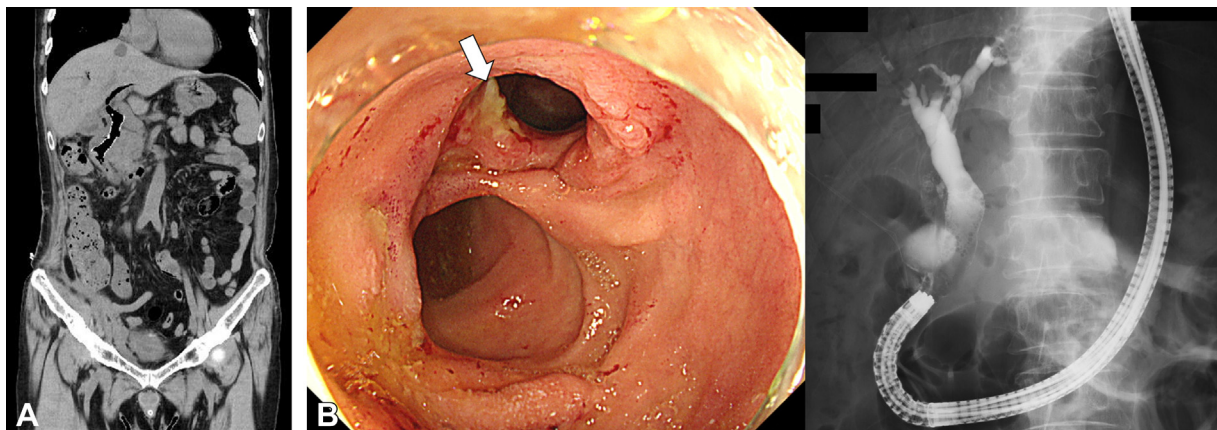


Figure 6. **A.** After 119 days of the initial endoscopic retrograde cholangiopancreatography procedure, the acute necrotic collection space almost disappeared after endoscopic necrosectomy. **B.** The complete closure of the periampullary perforation is confirmed with endoscopic (*arrow*) and fluoroscopic findings after covered self-expandable metallic stent removal.

DISCLOSURE

The authors disclosed no financial relationships.

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