



Endoscopic gallbladder drainage in high-risk surgical patients

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Nonsurgical candidates with acute cholecystitis are traditionally treated by percutaneous transhepatic or transperitoneal gallbladder drainage that achieves clinical response rates ranging from 56% to 100%.^{1,2} These approaches, however, may be associated with adverse events, including bleeding and postprocedural infections, in up to 65% of cirrhotic patients. In addition, percutaneous tube placement may result in patient dissatisfaction, discomfort, and risk of tube dislodgment.³ With the advent of novel endoscopic tools and techniques, internal gallbladder drainage has become an alternative for nonsurgical patients with acute cholecystitis. We describe

cases demonstrating successful gallbladder drainage using ERCP and EUS as an alternative for high-risk surgical cirrhotic patients with suspected acute cholecystitis ([Video 1](#), available online at www.VideoGIE.org).

The first case involved a 51-year-old man with advanced alcoholic liver disease presenting with abdominal pain, septic shock, and elevated liver function test results. Cross-sectional imaging revealed calculous acute cholecystitis with a large amount of ascites. After stabilization, transpapillary drainage was deemed the preferred approach to gallbladder drainage. The cystic duct takeoff could not be identified despite performance of an occlusion



Figure 1. Fluoroscopic image revealing a normal balloon occlusion cholangiogram without visualization of cystic duct.

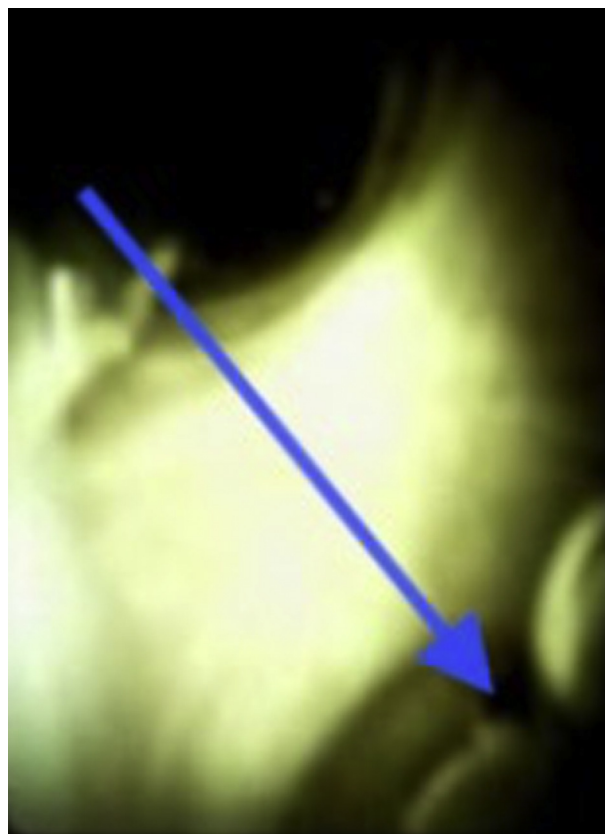


Figure 2. Direct visualization of cystic duct origin (*arrow*) deep to main bile duct during cholangioscopy.

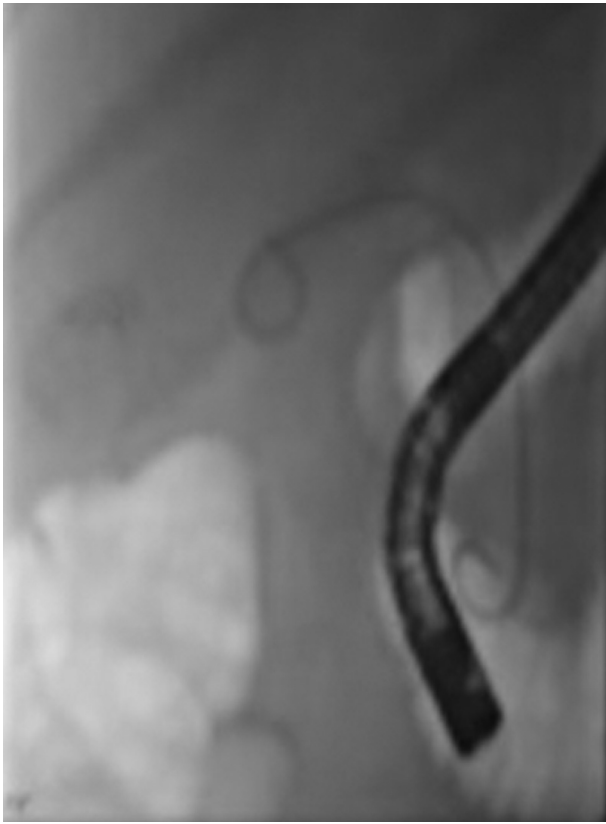


Figure 3. Successful fluoroscopic placement of transpapillary double-pigtail plastic stent.

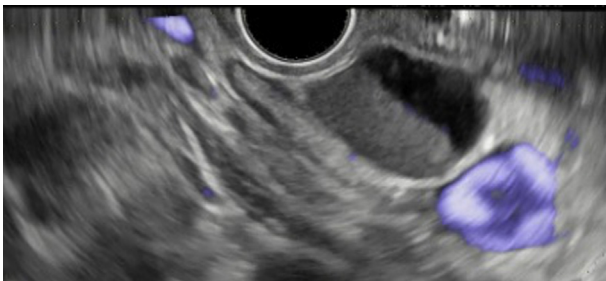


Figure 4. EUS view of the stomach revealing an enlarged gallbladder containing sludge without intervening vessels.

cholangiogram (Fig. 1). These challenges were overcome with same-setting cholangioscopy, which achieved direct visualization and wire cannulation of the cystic duct by use of the NaviPro 0.035" soft wire (Boston Scientific, Marlborough, Mass, USA) (Fig. 2). A 7F × 12-cm double-pigtail transpapillary plastic stent was successfully placed (Fig. 3). The patient was discharged the following day without delayed adverse events.

The second case was a 60-year-old woman with decompensated cirrhosis and profound thrombocytopenia (platelet count <30 K/ μ L) who presented with abdominal

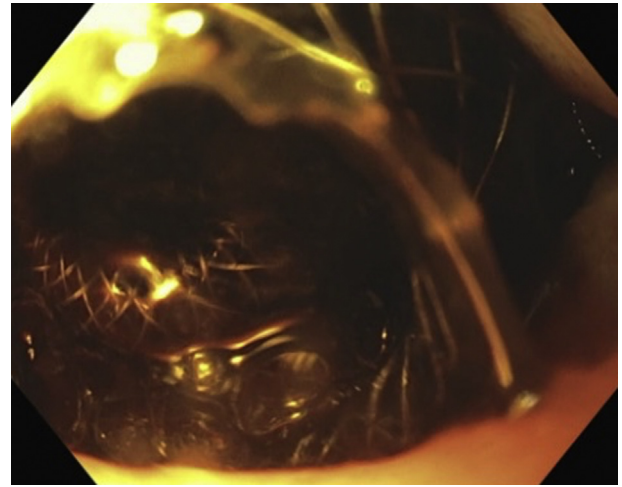


Figure 5. Successful deployment of lumen-apposing metal stent external flange in prepyloric region draining bile.

pain without peritoneal signs, fever, stable hemodynamics, and elevated transaminases. Cross-sectional imaging revealed features suggestive of acute cholecystitis. The patient was deemed not to be a favorable candidate for a surgical or percutaneous approach; thus, EUS gallbladder drainage was pursued. Multiple intervening vessels were seen from the duodenum, and a transgastric route was used (Fig. 4). The 1-step delivery lumen-apposing metal stent (LAMS) device was used to deploy a 10- × 15-mm LAMS across the stomach wall and into the gallbladder, resulting in bile drainage (Fig. 5). The patient was discharged the following day. She presented again 8 weeks later with symptomatic anemia and melena. Same-day endoscopy revealed a partially buried external stent flange within the stomach wall (Fig. 6). The stent was safely removed from the matured cholecystogastrostomy, revealing an ulcerated tract resulting from increased tension between the decompressed gallbladder and the stomach wall. Antegrade cholangiography confirmed an intact tract (Fig. 7). Placement of two 7F × 4-cm double-pigtail plastic stents was performed to maintain tract patency and relieve wall tension (Fig. 8).

Among decompensated cirrhotic patients with suspected acute cholecystitis deemed not fit for surgery, endoscopic gallbladder drainage is an alternative to percutaneous drainage that requires a multidisciplinary approach. EUS-guided gallbladder drainage with placement of a LAMS is safe and effective.⁴⁻⁶ However, issues of bleeding, stent migration, infection, and the potential adverse event of future liver transplantation should be considered. It has been described that cholecystoduodenostomy/gastrostomy repair during the time of transplantation can be challenging and potentially lead to adverse events and morbidity.⁷ Therefore, if it is technically feasible, transpapillary drainage should be considered first. This avoids potential technical surgical challenges,

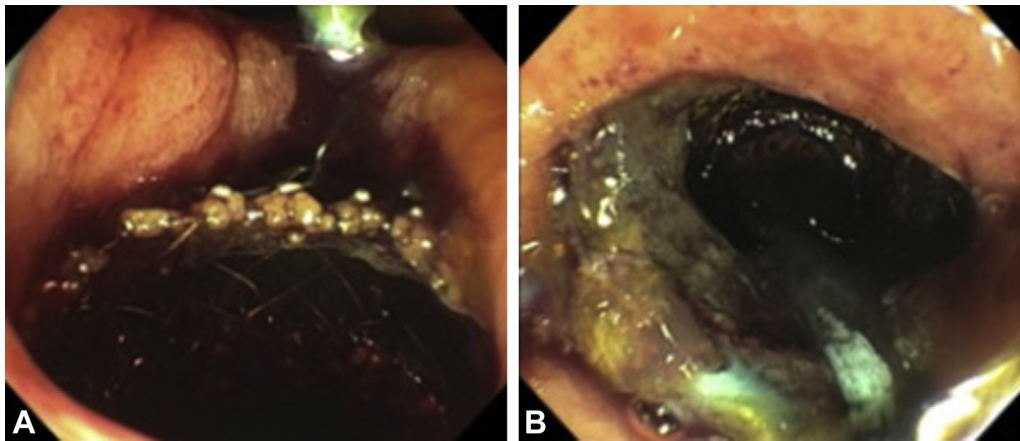


Figure 6. Partially buried external flange of previously placed lumen-apposing metal stent and double-pigtail stent buried within the prepyloric region of the stomach wall containing clotted blood and debris.



Figure 7. After endoscopic removal of partially buried stent, antegrade cholangiographic view demonstrating a mature intact cholecystogastrostomy without extravasation of contrast material.

and stents may be left in place for up to 2 years while the patient awaits transplantation.⁶ In the selection of a transgastric or transduodenal location for LAMS placement, some reports have suggested that transgastric placement may be associated with LAMS migration resulting from increased wall tension between the stomach and the decompressed gallbladder and may require a longer length stent to be placed.^{8,9}



Figure 8. Replacement of 2 longer double-pigtail plastic stents within mature cholecystogastrostomy to maintain patency and relieve apposing gallbladder and stomach wall tension.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

Abbreviation: LAMS, lumen-apposing metal stent.

REFERENCES

1. Kiviniemi H, Makela JT, Autio R, et al. Percutaneous cholecystostomy in acute cholecystitis in high-risk patients: an analysis of 69 patients. *Int Surg* 1998;83:299-302.

2. Davis CA, Landercasper J, Gundersen LH, et al. Effective use of percutaneous cholecystostomy in high-risk surgical patients: techniques, tube management, and results. *Arch Surg* 1999;134:727-31; discussion 731-2.
3. Mejia Perez LK, Brahmabhatt B, Gomez V. In “hot” pursuit of an evasive gallbladder. *VideoGIE* 2017;2:264-5.
4. Lee TH, Park DH. Endoscopic transpapillary gallbladder stenting for symptomatic gallbladder diseases. *Video J and Encycl GI Endosc* 2013;1:462-4.
5. Jain D, Bhandari BS, Agrawal N, et al. Endoscopic ultrasound-guided gallbladder drainage using a lumen-apposing metal stent for acute cholecystitis: a systematic review. *Clin Endosc*. Epub 2018 Jun 1.
6. Mony S, Khosravi F, Das A, et al. Antegrade cholangiogram via cholecystoduodenostomy in biliary pancreatitis. *VideoGIE* 2017;2:23-4.
7. Baron TH, Grimm IS, Gerber DA. Liver transplantation after endoscopic ultrasound-guided cholecystoduodenostomy for acute cholecystitis: a note of caution. *Liver Transpl* 2015;21:1322-3.
8. Irani S, Kozarek RA. The buried lumen-apposing metal stent: is this a stent problem, a location problem, or both? *VideoGIE* 2016;1:25-6.
9. Seerden TC, Vleggaar FP. Endoscopic removal of buried lumen-apposing metal stents used for cystogastrostomy and cholecystogastrostomy. *Endoscopy* 2016;48:E179.

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ERRATUM

Erratum to ‘Jejunal GI tumor using probe-based confocal laser endomicroscopy’ [*VideoGIE* 2018;3:220–2]



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The publisher regrets the title of the article “Jejunal GI tumor using probe-based confocal laser endomicroscopy” by Naoki Ohmiya et al (*VideoGIE* 2018;3:220–2) should have included the word “stromal.” The correct title should be “Jejunal GI stromal tumor using probe-based confocal laser endomicroscopy.”

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