Placing a lumen-apposing metal stent despite ascites: feasibility and safety

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Background and Aims: Placing a lumen-apposing metal stent (LAMS) through ascites carries serious risks, including death from leakage around the LAMS and failure to create a mature fistula between the 2 lumens. However, sometimes no options exist or are equally dangerous. We present 5 patients who underwent LAMS placement despite ascites in 2 different locations.

Methods: This is a retrospective review of 5 patients who underwent LAMS placement despite ascites in 2 different locations from 2016 to 2018.

Results: Three patients with cholecystitis and 2 patients with afferent limb syndrome and severe ascites were treated with a combination of preprocedural and intraprocedural paracentesis. Serum ascites albumin gradient was measured. Weight was recorded daily. Patients were encouraged to sleep at an incline, and periodic paracentesis (every 3-7 days) was performed when ascites reaccumulated over 4 weeks. Median volume of ascites aspirated was 2 L preprocedurally and 300 mL intraprocedurally. Only 1 patient had ascites with a high serum ascites albumin gradient and was treated with diuretics. Technical and clinical success was achieved in all 5 patients without any adverse events over a median follow-up of 28 weeks.

Conclusions: In situations in which no better options remain, LAMS placement appears to be safe after adequate and aggressive treatment of the underlying ascites pre-, intra-, and postprocedurally. Larger studies are needed to establish the safety of this approach. (VideoGIE 2020;5:586-90.)

Reasons for not placing a lumen-apposing metal stent (LAMS) through ascites include the risk of leakage of bile, pus, or succus around the LAMS and failure to create a mature fistula between the 2 lumens.[1] Consequences can be serious, including death. However, sometimes no options exist or are equally dangerous (eg, surgical gastrojejunostomy or percutaneous drains through ascites).[2,3] We present 5 patients who underwent LAMS placement despite ascites in 2 different locations (Video 1, available online at www.VideoGIE.org).

METHODS

A retrospective review of a maintained database on patients undergoing endoscopic ultrasound-guided gallbladder drainage (EUS-GBD) and gastroenterostomy (EUS-GE) from July 2016 to November 2018 was conducted at our tertiary referral centers that have extensive experience with the aforementioned procedure. Five patients were identified who needed intraprocedural paracentesis and 4 who also needed preprocedural paracentesis to allow identification of an adequate window to perform an EUS-GBD for cholecystitis or an EUS-GE for afferent limb syndrome.

Written informed consent was obtained from patients after the non–Food and Drug Administration–approved use of LAMSs to perform these procedures was explained; procedures were only performed after attempts at and failure of the other available options. These included ERCP transpapillary stents for cholecystitis and enteroscopy-assisted placement of pigtail stents for afferent limb syndrome. The institutional review board at our institution approved this study.

CASES AND ENDOSCOPIC METHODS

Preprocedural care

Patients were sent for paracentesis the day of or the day before the procedure. Nontransmural drainage had been attempted and failed (transpapillary stents for cholecystitis and pigtail intraluminal stents for afferent limb syndrome). Percutaneous drainage was considered to be just as risky and would likely result in a permanent drain, which all 5 patients refused.

Intraprocedurally, if any remaining ascites (despite the external paracentesis) precluded a nice apposition of the gallbladder or jejunum to the puncturing lumen (stomach or duodenum), a 19-gauge needle was used to aspirate the

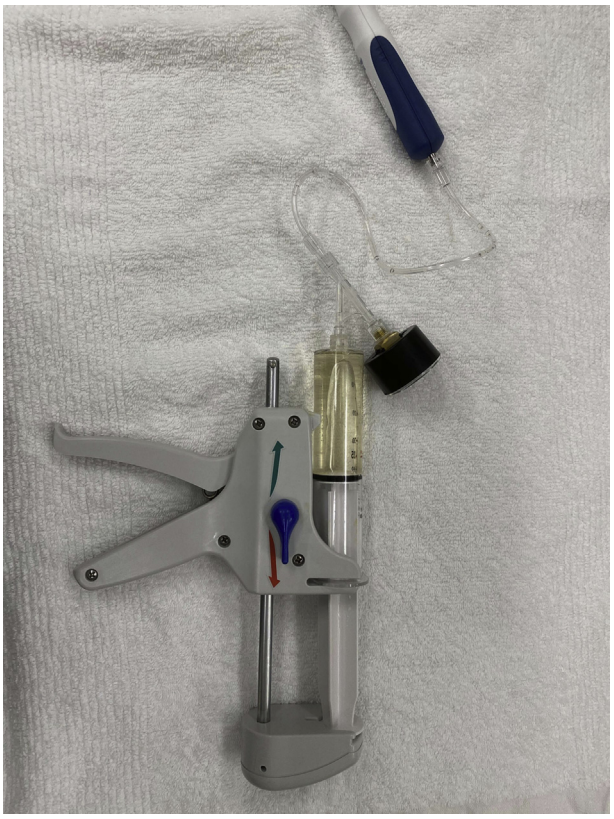

Figure 1. Nineteen-gauge needle attached to 60-mL syringe through which suction is applied by reversing the flow (*red arrow*) on the inflation device.

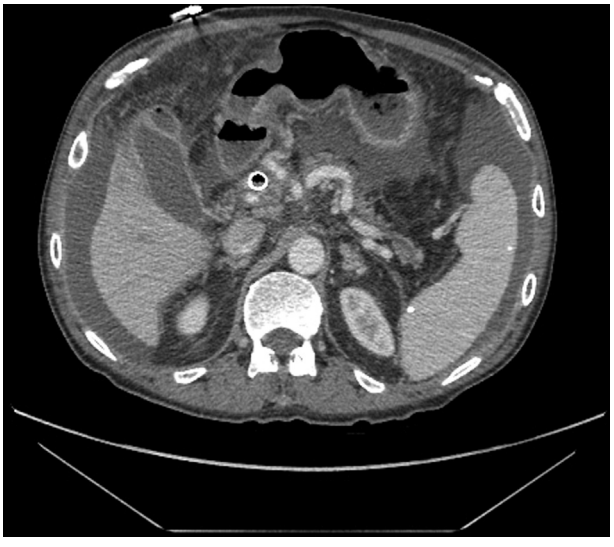

Figure 2. CT scan demonstrating large-volume ascites separating the gallbladder from the duodenal wall with changes of cholecystitis.

remaining fluid. We used a 60-mL syringe attached to an inflation device (used for standard balloon dilations) set to an aspiration mode. When this filled, we alternated with the 20-mL syringe provided with a standard 19-gauge needle kit (Fig. 1). A serum ascites albumin gradient was calculated on the ascites, and cytology samples were examined to determine which patients would benefit from postprocedural diuretics.

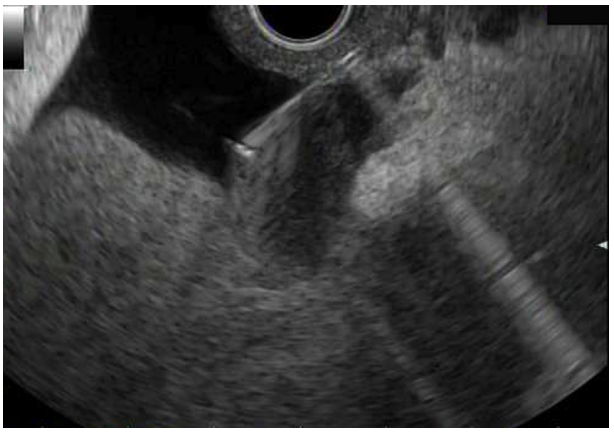

Figure 3. Ascites aspirated (650 mL) with a 19-gauge needle allowing approximation of the gallbladder to the duodenum.

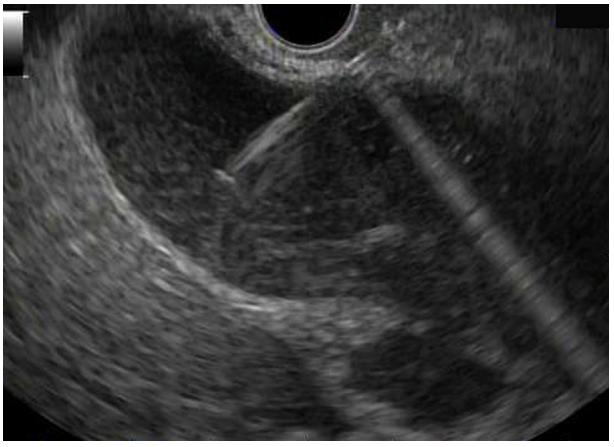

Figure 4. Endosonography demonstrating cholecystitis with an intramural abscess. Nineteen-gauge needle used to puncture the gallbladder.

Case 1

A 63-year-old man with metastatic pancreatic cancer and severe ascites (Fig. 2) presented with acute cholecystitis (Tokyo classification type 3) from a fully covered self-expandable metal stent occluding the cystic duct. Despite removal of the self-expandable metal stent, the cystic duct could not be cannulated to place a transpapillary stent. The patient had undergone a large-volume paracentesis the prior day, and intraprocedural aspiration of the remaining 650 mL of ascites with a 19-gauge needle (Fig. 3) allowed adequate apposition to perform a cholecystoduodenostomy with a 10-mm cautery-enhanced LAMS (Figs. 4 and 5). The patient's cholecystitis resolved, but he needed 3 more paracenteses over the next 4 weeks to allow formation of a mature fistula. The patient survived for 32 weeks after the procedure, and no adverse events were noted.

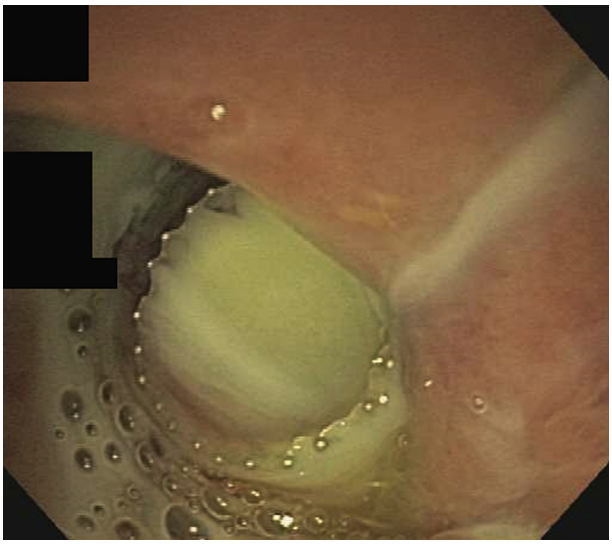

Figure 5. Endoscopic view after deployment of lumen-apposing metal stent with drainage of frank pus.

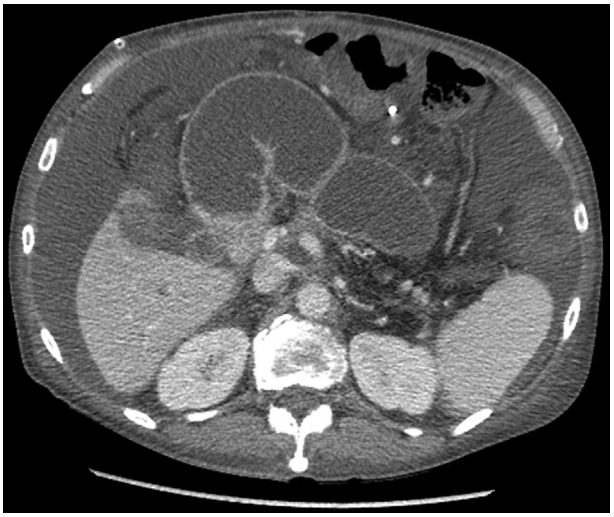

Figure 6. CT scan demonstrating large-volume ascites and afferent limb syndrome.

Case 2

A 66-year-old man with metastatic pancreatic cancer after pancreaticoduodenectomy and severe ascites presented with afferent limb syndrome resulting in cholangitis (Fig. 6). He failed 2 outside attempts at enteroscopy ERCP. After a large-volume paracentesis the day before and a third failed attempt at enteroscopy ERCP to traverse 2 very long strictures, he underwent an EUS-GE into the afferent limb to decompress the biliary tree. Intraprocedurally, an additional 650 mL of ascites was aspirated (Fig. 7) to facilitate apposition of the gastric and jejunal walls with a 15-mm cautery-enhanced LAMS (Figs. 8 and 9). His cholangitis resolved, and he survived for 9 weeks with no adverse events but did require 5 additional paracenteses over 4 weeks to allow mature fistula formation.

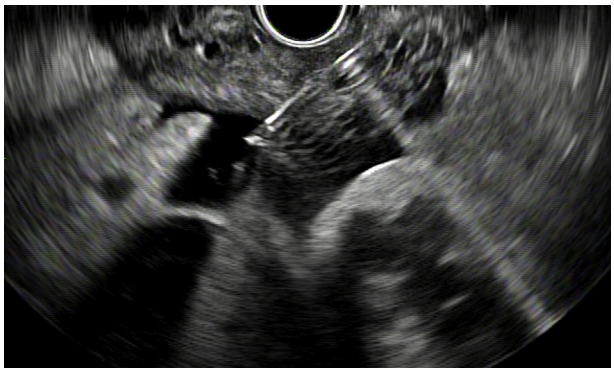

Figure 7. Ascites aspirated (650 mL) with a 19-gauge needle allowing approximation of the afferent limb to the gastric wall.

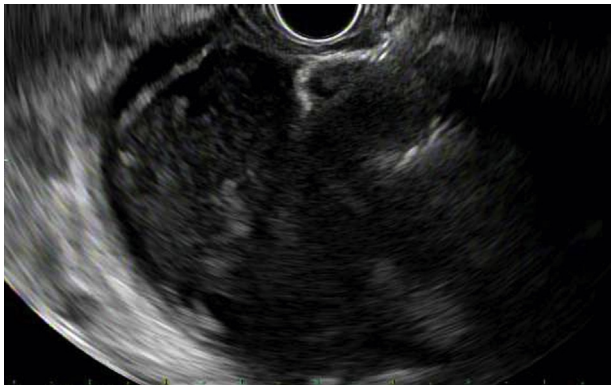

Figure 8. Endosonographic view of lumen-apposing metal stent deployed in the afferent limb.

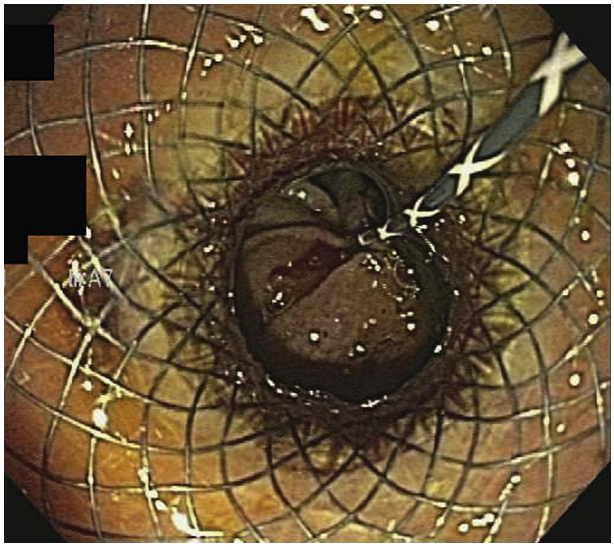

Figure 9. Endoscopic view after successful creation of a gastrojejunostomy to allow decompression of the afferent limb.

Postprocedural care

Antibiotics were given for 7 to 14 days, depending on the severity of the underlying cholecystitis or cholangitis from afferent limb syndrome. Weight was recorded daily

TABLE 1. Indications and technical details of procedures being performed in patients treated with lumen-apposing metal stents despite ascites (n = 5)

Patient number	Indication	Procedure performed	Volume of ascites tapped preprocedure, L	Volume of ascites tapped intraprocedurally, mL	LAMS used
1	Cholecystitis	EUS-GBD	4	650	10 × 10
2	Cholecystitis	EUS-GBD	2	200	10 × 10
3	Cholecystitis	EUS-GBD	None	300	10 × 10
4	Afferent limb syndrome	EUS-GJ	5	650	10 × 15
5	Afferent limb syndrome	EUS-GJ	2	300	10 × 15
Median			2	300	

EUS-GBD, Endoscopic ultrasound-guided gallbladder drainage; *EUS-GJ*, endoscopic ultrasound-guided gastrojejunostomy; *LAMS*, lumen-apposing metal stent.

TABLE 2. Clinical outcomes in patients treated with lumen-apposing metal stents despite ascites (n = 5)

Patient number	Technical success	Adverse events	Clinical success	Paracentesis over 4 wk	Diuretics for high SAAG	Follow-up, wk
1	Yes	None	Yes	Yes, 3	No	32
2	Yes	None	Yes	Yes, 1	No	28
3	Yes	None	Yes	No	No	54
4	Yes	None	Yes	Yes, 5	Yes	9
5	Yes	None	Yes	Yes, 1	No	4
Median						28

SAAG, Serum ascites albumin gradient.

in the hospital and after discharge, along with weekly examination for reaccumulation of ascites, which was then aspirated again over the next 4 weeks. Patients were encouraged to sleep at an incline of 30° to keep ascites accumulation in the pelvis. Diuretics were administered for a high serum ascites albumin gradient (SAAG).

RESULTS

Three patients with cholecystitis and 2 patients with afferent limb syndrome and severe ascites were treated with a combination of preprocedural and intraprocedural paracentesis to allow appropriate apposition of the gallbladder or intestinal lumen before placement of a LAMS. The median volume of ascites aspirated was 2 L (range, 0–5 L) preprocedurally and 300 mL (range, 200–650 mL) intraprocedurally. SAAG was greater than 1.1 in only 1 patient, who was treated with diuretics (spironolactone and furosemide). Based on the value of the SAAG, portal hypertension was the etiology of the ascites in only 1 patient, and the remaining 4 cases were due to malignant ascites confirmed on the cytology in the fluid and CT findings of peritoneal metastases (Table 1). A median of 2 paracenteses (range, 1–5) were performed in the ensuing 4 weeks. After 4 weeks, however, even though all 5 patients had reaccumulation of the ascites, they were treated only if symptomatic, with the assumption that a mature fistula (EUS-GBD and EUS-GE) had formed by then. Technical and clinical success was achieved in all 5 patients without any adverse events during a median follow-up of 28 weeks, at which point all 5 patients had died from their underlying malignancies (Table 2).

CONCLUSIONS

In situations in which no better option remains, LAMS placement appears to be safe after adequate and aggressive treatment of underlying ascites pre-, intra-, and postprocedurally. Larger studies are needed to establish the safety of this approach.

DISCLOSURE

Dr Irani is a consultant for Boston Scientific.

Abbreviations: EUS-GBD, endoscopic ultrasound-guided gallbladder drainage; EUS-GE, endoscopic ultrasound-guided gastroenterostomy; LAMS, lumen-apposing metal stent; SAAG, serum ascites albumin gradient.

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