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CASE REPORT | ENDOSCOPY

Therapeutic Endoscopy to the Rescue: EUS Gallbladder Drainage and ESD of a Giant Duodenal Polyp

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ABSTRACT

The role of endoscopy in the management of traditionally surgical conditions continues to evolve. Endoscopic techniques, including endoscopic mucosal resection and more recently endoscopic submucosal dissection, which remove cancerous and precancerous lesions in the gastrointestinal tract, continue to grow in use. In addition, therapeutic endoscopic ultrasound has evolved to include the management of patients with acute cholecystitis. Here, we present an 83-year-old man with acute calculus cholecystitis, who was considered ineligible for cholecystectomy and had a giant duodenal polyp that obstructed the visualization of the duodenal lumen, preventing the successful placement of lumen-apposing metal stents. Volume reduction of a duodenal polyp was performed through epinephrine injection to assist in the successful endoscopic ultrasound-guided gallbladder drainage. Subsequently, the patient underwent elective endoscopic mucosal resection to remove the giant duodenal polyp.

KEYWORDS: endoscopic ultrasound-guided gallbladder drainage; endoscopic submucosal dissection; duodenal polyp

INTRODUCTION

Endoscopic ultrasound-guided gallbladder drainage (EUS-GBD) has emerged as an alternative, since it was first described in 2007, to percutaneous transhepatic gallbladder drainage (PT-GBD) for patients with acute cholecystitis who present a high surgical risk.[1] The creation of a cholecystoduodenal or cholecystogastric anastomosis is necessary for EUS transmural drainage. However, the presence of a massive duodenal polyp in this patient impeded the visualization of the duodenal lumen. This case report describes using epinephrine volume reduction of a duodenal polyp to facilitate the achievement of a successful EUS-GBD procedure.

CASE REPORT

An 83-year-old White man was initially admitted with hypoxia, fever, and a productive cough. He was found to have pneumonia and gram-negative bacteremia. Clinically, the patient showed improvement with antibiotics; however, on hospital day 3, he developed lethargy, postprandial abdominal pain, and back pain. Further evaluation revealed acute cholecystitis through abdominal ultrasound and hepatobiliary iminodiacetic acid scan. Owing to severe comorbidities, the patient was considered at high risk for cholecystectomy. Consequently, EUS-GBD was planned by the gastroenterology service.

During upper endoscopy, a 50-mm broad-based polyp originating in the proximal duodenal bulb was observed. This polyp occupied the entire duodenal bulb, which limited lumen visualization (Figure 1). Biopsy of the polyp was performed. EUS demonstrated gallbladder stones (Figure 2) and confirmed that the polyp originated from the mucosa with no invasion into the submucosa or muscularis propria (Figure 2). No periduodenal lymph nodes were identified.

To facilitate lumen-apposing metal stent (LAMS) placement in the gallbladder, the duodenal bulb polyp was injected with a 1:10,000 solution of epinephrine (3 mL) for volume reduction, successfully achieving improved visualization of the duodenal bulb. With the improved view, a 15 × 10 mm LAMS was placed through the cholecystoduodenostomy, with flange in close approximation to the wall of the gallbladder and the duodenal bulb (Figure 1). The stent was dilated to 15 mm, and a 10 Fr × 3 cm double-pigtail plastic biliary stent was placed into the stent lumen.

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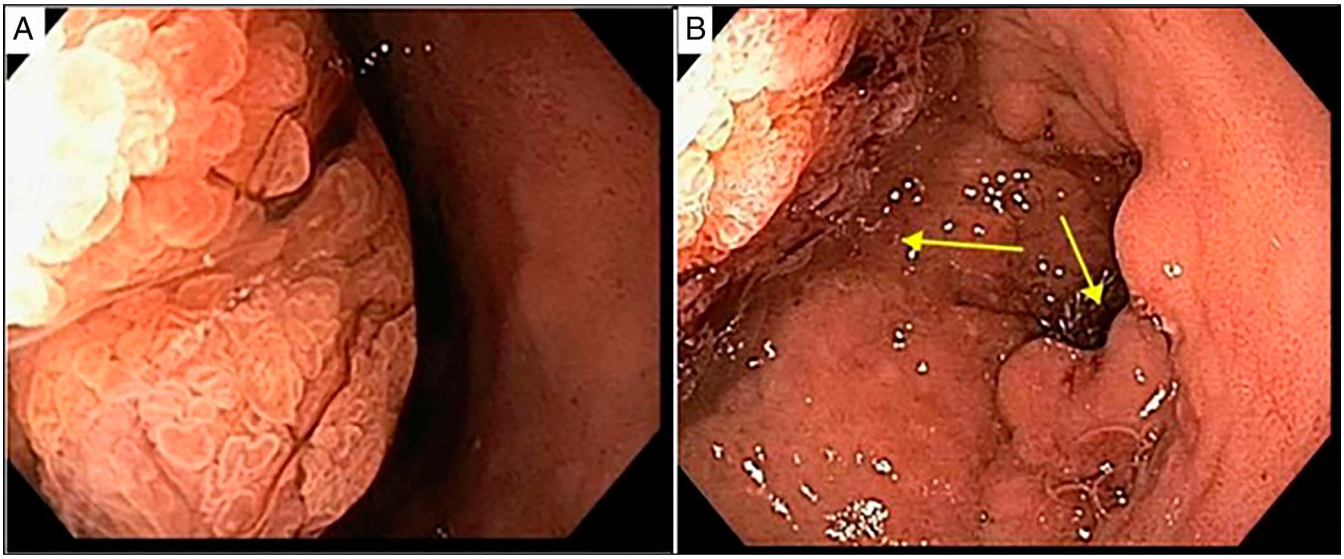

Figure 1. (A) Endoscopic view of the 50 mm broad-based polyp originating in the proximal duodenal bulb; (B) Endoscopic view of the duodenal bulb after epinephrine volume reduction of the polyp and LAMS placement (left arrow: Duodenal polyp, right arrow: LAMS). LAMS, lumen-apposing metal stents.

The patient's clinical condition improved, and he was discharged home. Biopsies from the duodenal polyp revealed a tubulovillous adenoma with focal features suspicious, but not diagnostic for high-grade dysplasia. A decision was made to perform an elective endoscopic polyp removal within a few weeks. During the procedure, it was determined that the polyp was too large for snare removal because a 4 cm snare could not encircle the lesion. Consequently, an endoscopic submucosal dissection (ESD) was performed (Figure 3). The presence of the LAMS limited the scope's retroflexion in the duodenal bulb, which is often necessary to facilitate completion of the circumferential mucosal incision on the distal side of the polyp. ESD was completed using a tapered distal attachment (ST Hood, Fujifilm, Tokyo, Japan) and underwater dissection, which significantly improved scope maneuverability. A 5 mm area of possible injury to the muscularis propria was identified, without perforation. An endoscopic tack and suture device (the X-Tack Endoscopic HeliX Tacking System, Apollo Endosurgery, Inc, Austin, Texas) was used to close the defect in a figure of 8 pattern, achieving excellent tissue approximation.

Pathology from the specimen indicated a 6.7 × 5.5 × 2.9 cm mass, which was a tubulovillous adenoma with scattered foci of high-grade dysplasia, with no evidence of carcinoma (Figure 4). The patient's recovery was favorable, and several months later, he returned for surveillance upper endoscopy, which revealed a scar in the duodenal bulb with no residual polyp. In addition, the LAMS was removed and replaced with 2 double-pigtail stents. Random biopsies of the ESD scar showed no residual polyp. Currently, the patient's condition is satisfactory.

DISCUSSION

For patients with acute cholecystitis deemed high risk for cholecystectomy, there are 3 major nonsurgical methods for

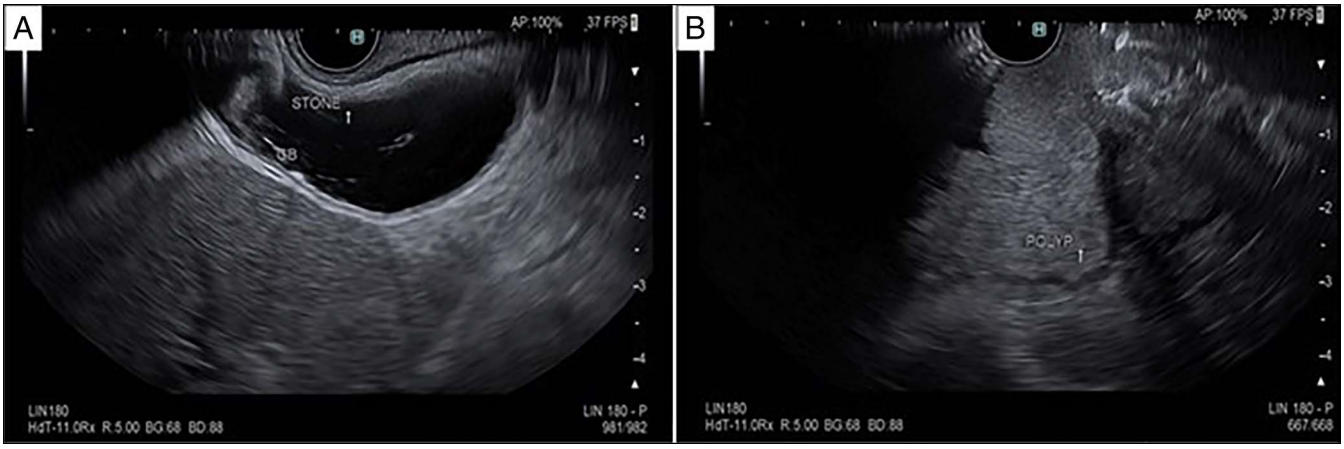

Figure 2. (A) EUS revealed the presence of gallstones and a thickened gallbladder wall; (B) EUS displayed the large hyperechoic polyp with well-defined borders. EUS, endoscopic ultrasound.

Figure 3. Endoscopic view of the duodenal bulb after endoscopic submucosal dissection of the large duodenal polyp.

gallbladder decompressions, including PT-GBD, endoscopic treatment through transpapillary gallbladder drainage (ET-GBD), and EUS-GBD.[2] A meta-analysis by Boregowda et al,[3] which encompassed a total of 1,136 patients in 11 eligible studies, demonstrated better technical success (89.9% vs, 87.5%, $P = 0.04$), fewer adverse events (14.6% vs 30%, $P = 0.00$), and lower reintervention rates (15% vs 67%, $P = 0.00$) in the EUS-GBD group compared with the PT-GBD group. In comparison with ET-GBD, EUS-GBD exhibited higher technical and clinical successes with comparable adverse events, notably pancreatitis, which occurred in 5.1% of those who underwent ET-GBD, and bleeding and perforation, which occurred in 4.3% and 3.7%, respectively, in those who underwent EUS-GBD.[4]

When evaluating patients for nonsurgical gallbladder drainage in cases of acute cholecystitis, multiple factors need to be taken into consideration. These include suspected gallbladder perforation, ability to tolerate sedation, anatomy, presence of ascites, future surgical candidacy, undergoing endoscopic retrograde cholangiopancreatography for other reasons, and local expertise.[2] Our patient displayed no signs of gallbladder perforation, ascites, choledocholithiasis, or cholangitis and was able to tolerate sedation. Consequently, EUS-GBD was deemed an appropriate approach to be considered.

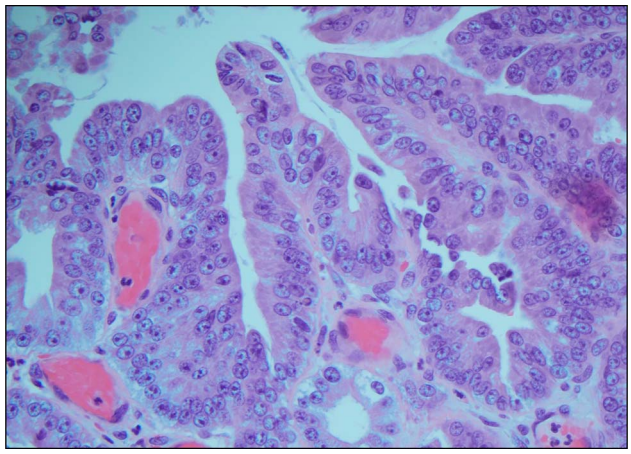

Figure 4. Hematoxylin and eosin stain revealed cytologic atypia at foci approaching high-grade dysplasia (40x magnification).

Randomized controlled trials comparing transgastric and transduodenal approaches for EUS-GBD are lacking. However, a retrospective analysis showed a higher rate of inward migration of LAMS in the transgastric group, likely due to the increased thickness of the gastric wall and gastric contraction forces.[5] In addition, there was a potential higher risk of stent occlusion from food when using the transgastric approach.[2] Therefore, we adopted the transgastric approach after achieving a significant size reduction of the duodenal polyp, ensuring safe placement of the LAMS in the duodenum. Furthermore, we performed LAMS dilation during the index procedure, facilitating rapid gallbladder drainage. In addition, the dilation enables the placement of a double-pigtail plastic biliary stent across the LAMS, potentially reducing the risks of stent obstruction, bleeding, and contralateral wall injury associated with the LAMS.[2]

Hogan et al reported the use of epinephrine volume reduction for giant colon polyps, defined as larger than 3 cm, in 3 patients.[6] They observed greater than 80% reduction in polyp volume after epinephrine injection, which facilitated endoscopic evaluation and removal. To the best of our knowledge, there have been no reports of epinephrine volume reduction for duodenal polyps. Our case highlights the efficacy of epinephrine volume reduction for a large duodenal polyp before the EUS-GBD, improving visual field of the duodenal bulb and placement of the LAMS.

Nonampullary duodenal polyps can occur sporadically or be associated with genetic syndromes, such as familial adenomatous polyposis and MUTYH (MutY homolog)-associated polyposis.[7] In a study involving 44 sporadic nonampullary duodenal adenomas with low-grade dysplasia, followed up for at least 6 months, 20.9% of them progressed to high-grade dysplasia, including 4.7% that eventually progressed to noninvasive carcinoma.[8] In addition, they found that high-grade dysplasia diagnosed at the initial biopsy and a lesion diameter of 20 mm or larger are predictors for progression to adenocarcinoma in a multivariate analysis. EMR is recommended as the first-line endoscopic resection technique for nonmalignant large nonampullary duodenal adenomas.[7] ESD has been reported to have a high en bloc resection rate in expert Asian centers, but no differences in long-term outcomes and survival have been observed, albeit with significantly high rates of intraprocedural perforation and delayed perforation.[9,10] Therefore, duodenal ESD should be reserved for select indications at expert centers.[7] In our patient, the size of the duodenal polyp size was too large for EMR; therefore, ESD was chosen. To prevent perforation, an endoscopic tack and suture device was used to close the defect.

In conclusion, our case highlights the evolving role of therapeutic endoscopy in managing traditionally surgical conditions. This includes the use of EUS-GBD for acute cholecystitis in nonsurgical candidates, as well as ESD for large duodenal adenomas. In addition, our report presents the utilization of epinephrine volume reduction for a large duodenal polyp before the placement of LAMS placement.

DISCLOSURES

Author contributions: B. Chen and R. Johal: drafting and critical revision of the article, final approval of the article. M. Abdulsamad: conception, interpretation of the clinical data, final approval of the article. B. Chen is the article guarantor.

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Informed consent was obtained for this case report.

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