

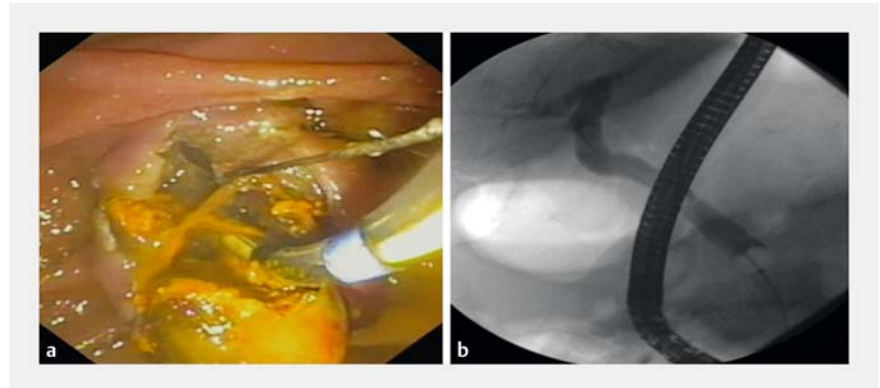
Single-session endoscopic ultrasound-guided gallbladder drainage combined with ERCP for acute cholecystitis and choledocholithiasis in a nonsurgical patient

A 93-year-old man with a recent history of acute coronary syndrome presented with upper right abdominal pain and jaundice. Laboratory analysis showed leukocytosis, elevated C-reactive protein, hypertransaminasemia, and cholestasis (total bilirubin 4.39 mg/dL, alkaline phosphatase 137 U/L, and γ -glutamyl-transferase 287 U/L). Abdominal ultrasonography revealed acute cholecystitis with a dilated common bile duct.

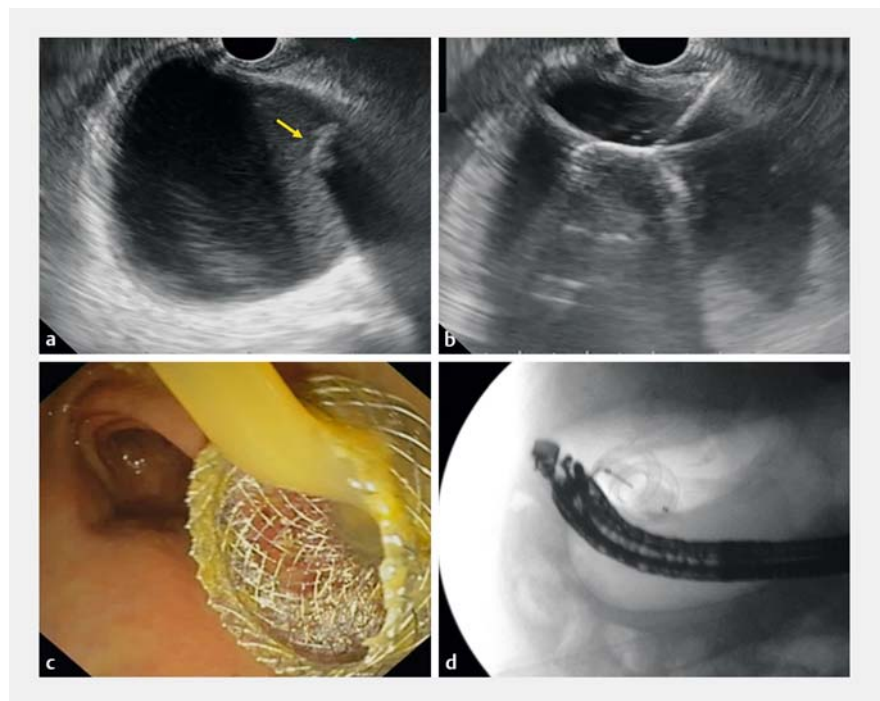
The patient was not a surgical candidate. A comprehensive endoscopic approach was offered, combining endoscopic retrograde cholangiopancreatography (ERCP) with endoscopic ultrasound-guided gallbladder drainage (EUS-GBD) with a lumen-apposing metal stent (LAMS) in the same session.

First, ERCP was performed. After selective biliary cannulation and endoscopic sphincterotomy, an impacted stone was removed. A small amount of pus drained. Final cholangiogram showed no residual stones and absence of gallbladder filling (► Fig. 1). Initially, transpapillary gallbladder drainage was attempted, but it was impossible to advance a guidewire through the cystic duct into the gallbladder.

EUS-guided cholecystogastrostomy was performed in tandem. EUS identified a distended gallbladder with gallstones. Gallbladder drainage was achieved by placing a 15-mm \times 10-mm electrocautery-enhanced LAMS (Hot Axios; Boston Scientific, Marlborough, Massachusetts, USA) with freehand technique. After stent placement, a large amount of pus drained into the stomach from the gallbladder (► Fig. 2). The echoendoscope was exchanged for a gastroscope. The LAMS was dilated with a 12-mm balloon. The gastroscope was then advanced into the gallbladder, showing multiple stones. The gallstones were removed with a Roth net snare, irrigation, and suction. Final cholecystoscopy showed a clean gallbladder (► Fig. 3; ► Video 1). Complete pro-



► Fig. 1 Endoscopic retrograde cholangiopancreatography images. **a** Endoscopic sphincterotomy with impacted stone removal. **b** Final cholangiogram showing no residual stones.



► Fig. 2 Endoscopic ultrasound (EUS)-guided gallbladder drainage. **a** EUS image showing a distended gallbladder. Yellow arrow indicates a gallstone with posterior acoustic shadow. **b** Placement of a lumen-apposing metal stent (LAMS) freehand under EUS guidance. **c** Endoscopic view showing pus draining from the gallbladder into the stomach through the LAMS. **d** Fluoroscopic image showing the LAMS successfully deployed.

cedure time (including ERCP and EUS-GBD) was 40 min. The patient improved rapidly, starting oral feeding on day 1. His liver function tests normalized and

he was discharged on day 2 without adverse events.

EUS-GBD is an effective and safe technique for the treatment of acute chole-



► **Fig. 3** Endoscopic extraction of gallbladder stones through the LAMS. **a** Balloon dilation of the LAMS. **b** Retroflexed view inside the gallbladder showing multiple gallstones. **c** Endoscopic removal of gallstones using a Roth net snare. **d** Final cholecystoscopy showing no residual stones.



► **Video 1** Endoscopic ultrasound-guided gallbladder drainage combined with endoscopic retrograde cholangiopancreatography in the same session.



potentially simplifying logistics, and saving hospitalization costs.

Endoscopy_UCTN_Code_TTT_1AS_2AG

Competing interests

Dr. Villarroel is a consultant for Boston Scientific. Dr. Perez-Miranda is a consultant for Boston Scientific and M.I.Tech and has lectured for Boston Scientific, Taewoong, and Olympus. No conflicts have been declared by Dr. de la Serna-Higuera.

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cystitis in high-risk patients [1] and represents an alternative to percutaneous cholecystostomy without the morbidity and inconvenience of external drain placement [2]. When acute cholecystitis coexists with choledocholithiasis in patients unfit to undergo surgery, a single-step procedure performed with ERCP plus EUS-GBD with a LAMS has a high

technical and clinical success rate when performed by experienced endoscopists, with low complication and reintervention rates [3].

In conclusion, this case demonstrates a successful dual endoscopic approach to biliary stone disease in a single-session combined procedure, in a patient unfit for surgery, avoiding external drainage,