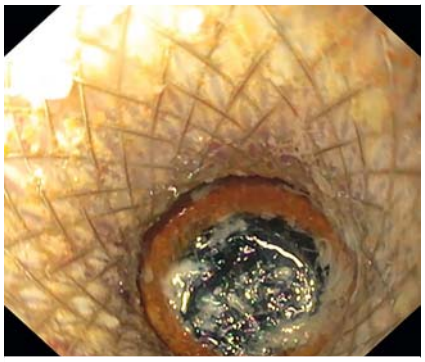
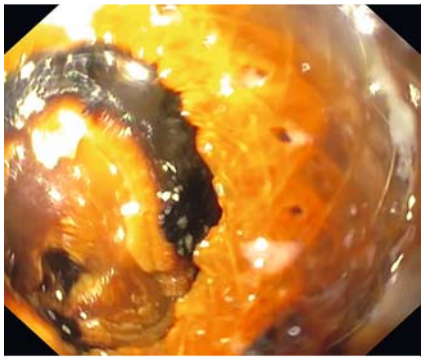
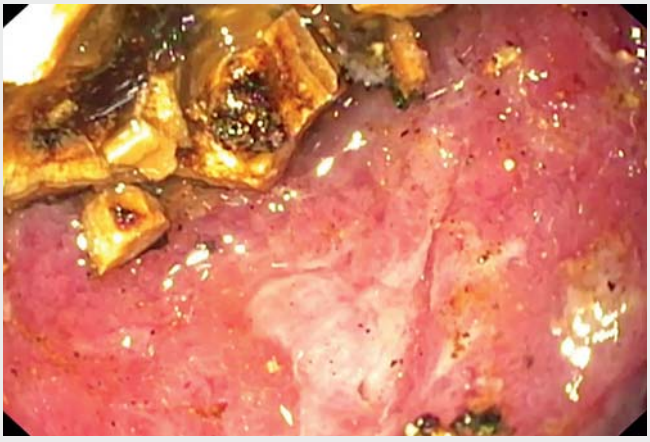
Electrohydraulic lithotripsy for the treatment of stone impacted in a lumen-apposing metal stent in a patient with endoscopic cholecystoduodenostomy



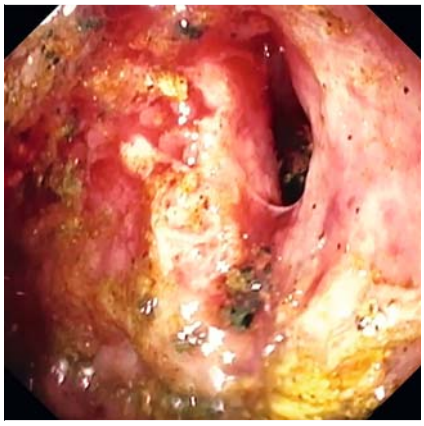
▶ **Fig. 1** Lumen-apposing metal stent (LAMS) obstructed by a biliary stone impacted in the stent lumen.



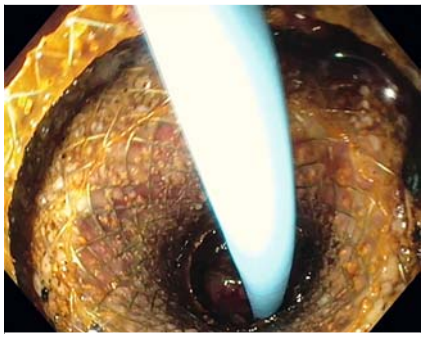
▶ **Fig. 2** Fragmentation of biliary stone by means of electrohydraulic lithotripsy.



Video 1 Biliary stone occluding a lumen-apposing metal stent treated with electrohydraulic lithotripsy in a patient who had previously undergone endoscopic ultrasound-guided cholecystoduodenostomy.



▶ **Fig. 3** A 10-mm fistula in the gallbladder wall with fragmented stones in the cavity.



▶ **Fig. 4** Placement of a plastic double-pigtail stent to prevent renewed occlusion.

An 89-year-old woman presented to our department having experienced acute cholecystitis a few weeks previously. Her comorbidities, chronic kidney disease, and congestive heart failure meant she was not a suitable candidate for surgery. She underwent EUS-guided gallbladder drainage, which was performed without complications. During this procedure, a 10-mm × 10-mm lumen-apposing metal stent (LAMS) (Hot Axios; Boston Scientific) was implanted for gallbladder drainage. A few days later, the patient complained of right-upper quadrant abdominal pain and fever, and a new acute cholecystitis episode was diagnosed.

Upper endoscopy with a therapeutic endoscope (GIF-1TH190; Olympus) was performed. The endoscope was introduced as far as the duodenum, where it became evident that the LAMS was obstructed by a biliary stone impacted in the stent lumen (▶ **Fig. 1**; ▶ **Video 1**). Electrohydraulic lithotripsy (EHL) (1.9-Fr, 375-cm Biliary EHL Probe Autolith; Boston Scientific) was performed to fragment the obstructive biliary stone. The EHL probe was introduced through the endoscope, and fragmentation with the infusion of saline was started (▶ **Fig. 2**). The gallbladder stone was broken into multiple fragments that were removed with a Dormia basket. During the procedure, which lasted about 60 min, purulent secretion was seen draining from the

gallbladder. The gallbladder wall showed a 10 mm-fistula with some fragmented stones within the cavity (▶ **Fig. 3**); these were removed with a Roth Net retriever. To prevent renewed LAMS occlusion, placement of a plastic double-pigtail stent was decided on (▶ **Fig. 4**). No complications were observed in the patient; she tolerated the procedure and was discharged home a few days later.

EUS-guided gallbladder drainage in patients who are not candidates for surgery is a safe technique and has a low complication rate. In patients with large stones, recurrent cholecystitis, impaction, and LAMS obstruction can occur [1, 2]. EHL and laser lithotripsy are two useful techniques that allow fragmentation of stones; EHL generates high-amplitude hydraulic pressure waves, while laser lithotripsy uses a laser beam with repetitive pulses of laser energy to create a mechanical shockwave [3, 4]. EHL is a safe option to resolve LAMS occlusion in cholecystoduodenostomy.

Endoscopy_UCTN_Code_CPL_1AL_2AD

Competing interests

The authors declare that they have no conflict of interest.

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Endoscopy 2021; 53: E415–E416
DOI 10.1055/a-1334-3970
ISSN 0013-726X
published online 14.1.2021

Georg Thieme Verlag KG, Rüdigerstraße 14, 70469 Stuttgart, Germany