



Endoscopic holmium laser lithotripsy for therapy of Bouveret syndrome

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INTRODUCTION

Bouveret syndrome is a rare condition characterized by the impaction of a gallstone in the stomach or duodenum via a fistulous tract resulting in gastric outlet obstruction or ileus in the setting of cholecystitis.^{1,2} This condition generally requires surgery to remove the impacted stone, repair the fistula, and remove the gallbladder. However, for patients who are unable to undergo surgery, laser lithotripsy can be an alternative therapy.^{3,4} For biliary stones, a holmium laser has yet to be widely adopted, partly because of the cost and limited availability of the equipment.

Here, we present a case of a patient with recurrent gallstone ileus and subsequent Bouveret syndrome successfully treated by endoscopic holmium laser lithotripsy.

CASE DESCRIPTION AND PROCEDURE

A 79-year-old woman with multiple comorbidities including coronary artery disease, obesity, and chronic cholecystitis presented with right upper quadrant abdominal pain. An abdominal CT scan demonstrated emphysematous calculous cholecystitis, a cholecystoduodenal fistula, and a 30-mm gallstone lodged in the terminal ileum with a worsening small-bowel ileus (Fig. 1). As the stone could not pass the ileocecal valve and the patient started to decompensate hemodynamically, she emergently underwent an ileocecal resection and partial right colectomy, confirming the diagnosis of gallstone ileus and a small-bowel perforation. Ten days postsurgically, the patient again developed nausea, vomiting, and right upper quadrant pain. CT imaging redemonstrated a 40-mm gallstone within the gallbladder fossa, at the opening of the fistulous tract. Surgical options were

limited because of a friable duodenum and inflammation of the cholecystoduodenal fistula. Given the lack of an ileocecal valve, it was thought that the stone would likely pass but her ileus worsened. After a multidisciplinary discussion, endoscopic therapy was planned.

Endoscopically (Video 1, available online at www.giejournal.org), a large gallstone measuring about 40 mm was encountered upon entry into the duodenal bulb eroding into the duodenum consistent with the known cholecystoduodenal fistula (Fig. 2). A holmium:yttrium-aluminum-garnet laser generator (Lumenis, Yokneam, Israel) with Flexiva Pulse ID Tractip fibers (Boston Scientific, Marlborough, Mass, USA) was used to fragment the stone through a standard gastroscope (Fig. 3). An underwater technique with frequent irrigation was used to clear debris and allow for laser penetration without refraction. Because of the gallstone's size, this procedure was performed in 2 sessions. During the first session (103 minutes), the stone was successfully fractured into smaller fragments (Fig. 4). In the subsequent session 5 days later (120 minutes), the remaining gallstone measuring about 28 mm was fragmented until the fistula tract was fully cleared (Figs. 5 and 6). The larger gallstone fragments were removed using a roth net and a stone retrieval basket while the remaining smaller stones fragments passed spontaneously into the duodenum (Figs. 7 and 8). Full resolution of symptoms was achieved. After the first procedure, she was admitted to the intensive care unit in the setting of pneumo-septic shock and was discharged 5 days later. No immediate or delayed adverse events were noted after the second session, and no subsequent surgical management of fistula was needed. The patient is now doing well 3 months postprocedurally.

DISCUSSION

Bouveret syndrome is an uncommon yet challenging clinical condition. Although surgery is often required for definitive therapy, endoscopic management remains a feasible option in select cases with appropriate expertise.^{4,5} Given the size and calcified consistency of the stone, we opted for holmium laser lithotripsy rather than other treatment options.^{6,7} There was total resolution of symptoms and no adverse events. Although using this technique is

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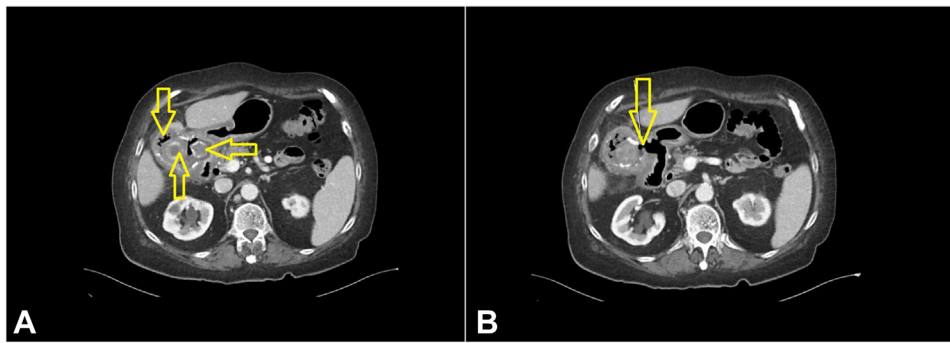


Figure 1. Abdominal CT scan showing emphysematous calculous cholecystitis (A) and a cholecystoduodenal fistula (B).

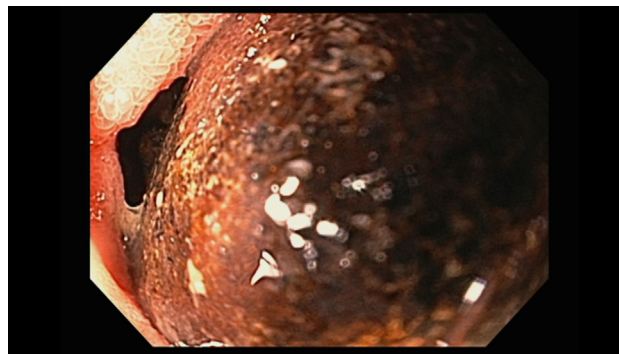


Figure 2. A 40-mm gallstone at the opening of the fistulous tract.

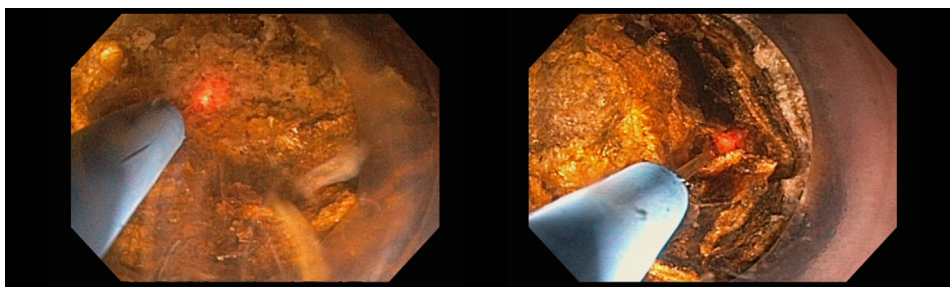


Figure 3. Holmium laser lithotripsy of the large gallstone.



Figure 4. Fragmentation of the large gallstone lodge in the fistulous tract.

lengthy and requires advanced endoscopic expertise, it provides a great benefit in terms of tissue preservation, recovery time, and safety.

DISCLOSURE

Dr Pleskow is a consultant for Boston Scientific and Olympus. All other authors disclosed no financial relationships.



Figure 5. Clearance of fistula tract after gallstone fragmentation.



Figure 7. Smaller stones fragments passed spontaneously into the duodenum.

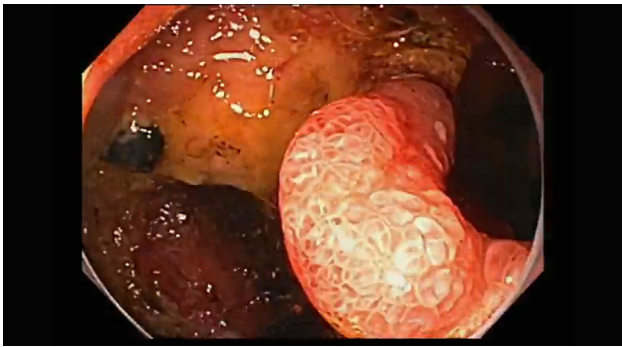


Figure 6. Complete clearance of the fistula and gallbladder lumen.

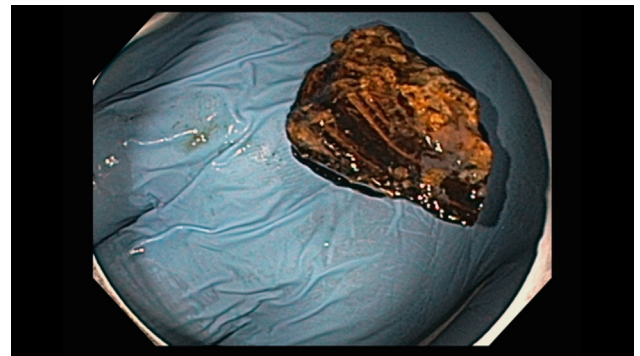


Figure 8. Larger fragment removed.

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