Effective endoscopic holmium laser lithotripsy in the treatment of a large impacted gallstone in the duodenum

Fig. 1 Computed tomographic scan shows a large calcified ring (stone) in the duodenum of an 87-year-old woman presenting with abdominal pain and vomiting of 3 days' duration.

Gallstone ileus is caused by the passage of one or more large gallstones (at least 2.5 cm in size) in the gastrointestinal tract through a bilioenteric fistula. It accounts for 1% to 4% of all cases of mechanical small-bowel obstruction [1,2]. The obstructing gallstone is usually impacted in the terminal ileum, rarely the duodenum [1]. Computed tomography generally reveals mechanical bowel obstruction, pneumobilia, and an ectopic stone in the intestinal lumen (Rigler's triad) [3]. Although surgery is considered the gold standard treatment, a less invasive endoscopic approach is advisable in high risk patients [4].

An 87-year-old woman was admitted to the emergency department with abdominal pain and vomiting of 3 days' duration. Computed tomography showed a large, calcified ring in the duodenum and aerobilia (► **Fig. 1**). Upper gastrointestinal endoscopy revealed a large obstructive stone in the duodenal bulb that could not be removed endoscopically, even after pyloric dilation. Because of the obstructive symptoms, a gastrojejunal anastomosis was created, which partially relieved the obstruction.

To fragment the stone, we performed another endoscopic procedure. A holmium laser (HLS30 W Holmium:YAG 30 W Laser; Olympus America, Center Valley, Pennsylvania, USA) was applied for a total of approximately 200 minutes. This resulted in fragmentation of the stone into small parts, which were removed with an extraction basket and a retrieval device (► **Video 1**).

Endoscopic holmium laser lithotripsy treatment of a large impacted gallstone in the duodenum.

The patient was discharged after 15 days with complete resolution of the occlusive symptoms, and her scheduled cholecystectomy was canceled.

Endoscopy_UCTN_Code_CCL_1AZ_2AD

Competing interests: None

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DOI <http://dx.doi.org/10.1055/s-0034-1393150>
Endoscopy 2015; 47: E485
© Georg Thieme Verlag KG
Stuttgart · New York
ISSN 0013-726X

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