



Cholangioscopy-guided holmium laser lithotripsy of a stone trapped in a mechanical lithotripter

Diogo Libânio, MD,¹ Sílvia Giestas, MD,² David Martinez-Ares, MD, PhD,² Jorge Canena, MD, PhD,³ Luís Lopes, MD, PhD^{4,5}

Large common bile duct (CBD) stones can be removed with mechanical lithotripsy, although over-the-basket techniques such as electrohydraulic or pulsed dye laser lithotripsy can be necessary in cases of stone impaction.¹ We report the case of a 42-year-old woman with a 30-mm stone in the CBD in whom mechanical lithotripsy was attempted after wide sphincterotomy. However, during the procedure, a rupture occurred in the traction wire of the basket, next to the handle. Emergency lithotripsy (EL) with use of an external-type system was immediately attempted, but wire fracture occurred again (2 times), turning its length shorter than the metallic sheath of the EL and rendering EL impossible. Given that the stone and basket were impacted in the CBD (Figs. 1 and 2), a temporary biliary stent was inserted, and the metallic wires were oriented from the mouth to the nose (Fig. 3). Five days later, holmium laser lithotripsy was performed under direct per-oral cholangioscopy by use of a gastroscope advanced into the CBD (free-hand technique). A gastroscope was used because access to the biliary tree was easy and because of its superior image quality and maneuverability. We used holmium laser technology (Auriga XL Ho:YAG; Lynton Surgical, Cheshire, U.K.) delivered through a 365- μ m fiber, with energy levels set between 800 and 1500 mJ at a frequency of 8 to 15 Hz (Fig. 4; Video 1, available online at www.VideoGIE.org). A green aiming beam was used to target the stone, and energy was delivered under direct vision in bursts of less than 5 seconds under continuous saline solution infusion, to avoid damage to the CBD wall. The stone fragments and the trapped basket were then removed, and complete CBD clearance was achieved. The patient's recovery was favorable, with rapid improvement in symptoms and jaundice, and there were no adverse events. Although cholangioscopy-assisted laser lithotripsy has previously been reported,^{2,3} to our knowledge this is the first report of its use in the resolution of this uncommon adverse event (1.4%)⁴ of mechanical lithotripsy, which can occur with large hard stones and was traditionally treated by surgery.⁵ Alternatives to this technique would be the placement of plastic or metallic stents, further attempts at basket removal after several days, and balloon dilation, although we believe that our strategy has a higher probability of

success and a lower risk of adverse events when compared with balloon dilation.

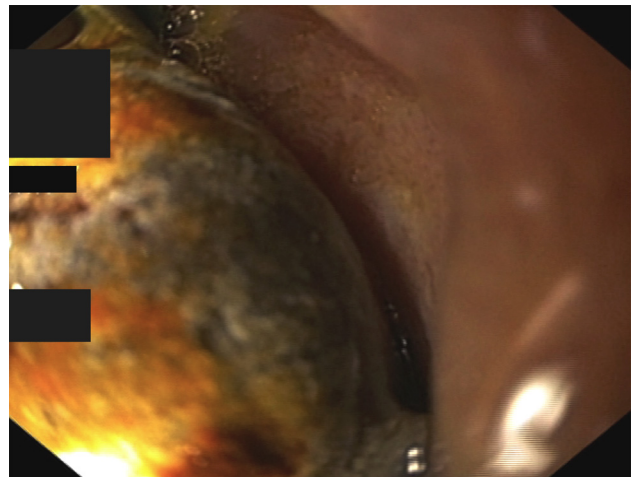


Figure 1. Direct cholangioscopic view of a large stone impacted in the common bile duct.

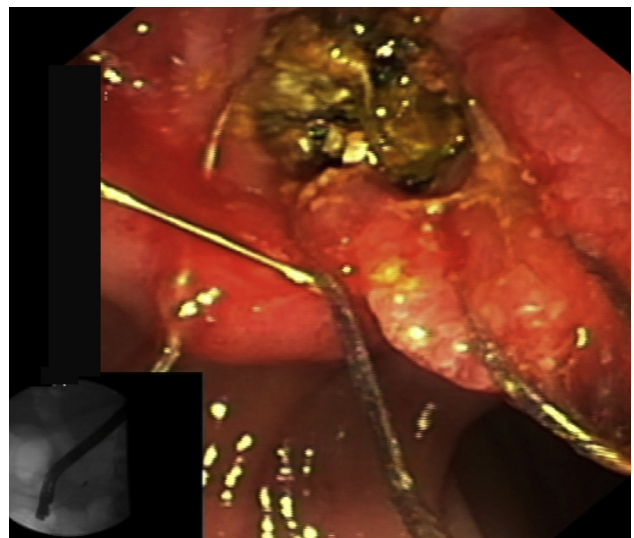


Figure 2. Basket entrapped in the common bile duct because of rupture of the metallic wire system.

Written transcript of the video audio is available online at www.VideoGIE.org.

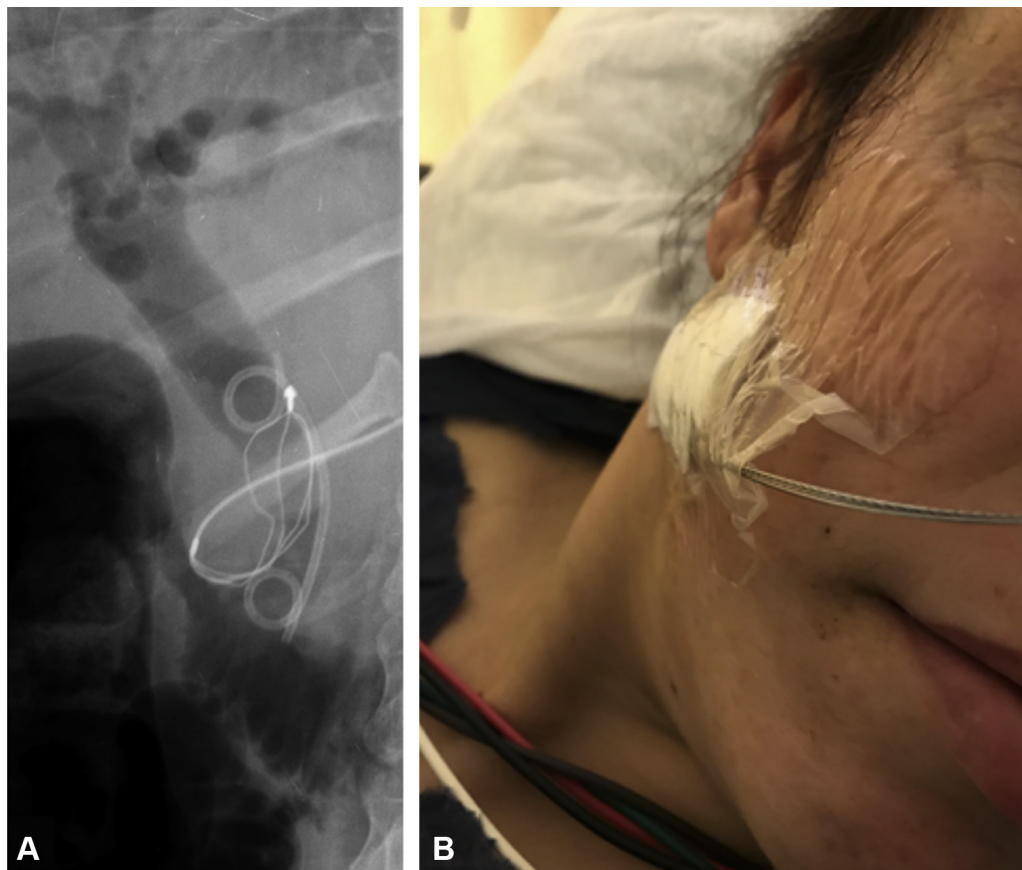


Figure 3. **A**, Insertion of a plastic biliary stent. **B**, Redirection of the basket wires from the mouth to the nose to reduce patient discomfort.

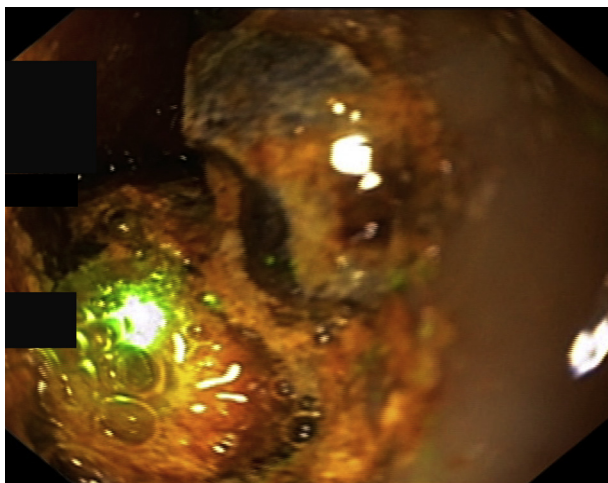


Figure 4. Fragmentation of the stone with holmium laser under direct vision, 5 days after stent insertion and redirection of basket wires.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

Abbreviations: CBD, common bile duct; EL, emergency lithotripsy.

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Gastroenterology Department, Instituto Português de Oncologia do Porto, Porto, Portugal (1); Gastroenterology Department, Unidade Local de Saúde Alto Minho, Viana do Castelo, Portugal (2); Centre of Gastroenterology, CUF Infante Santo, Lisboa, Portugal (3); Gastroenterology Department, Unidade Local de Saúde Alto Minho, Viana do Castelo, Portugal (4); School of Medicine, University of Minho, Braga, Portugal (5).

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