

Complex biliary stricture treated by percutaneous single-operator cholangioscopy and multiple biodegradable stents

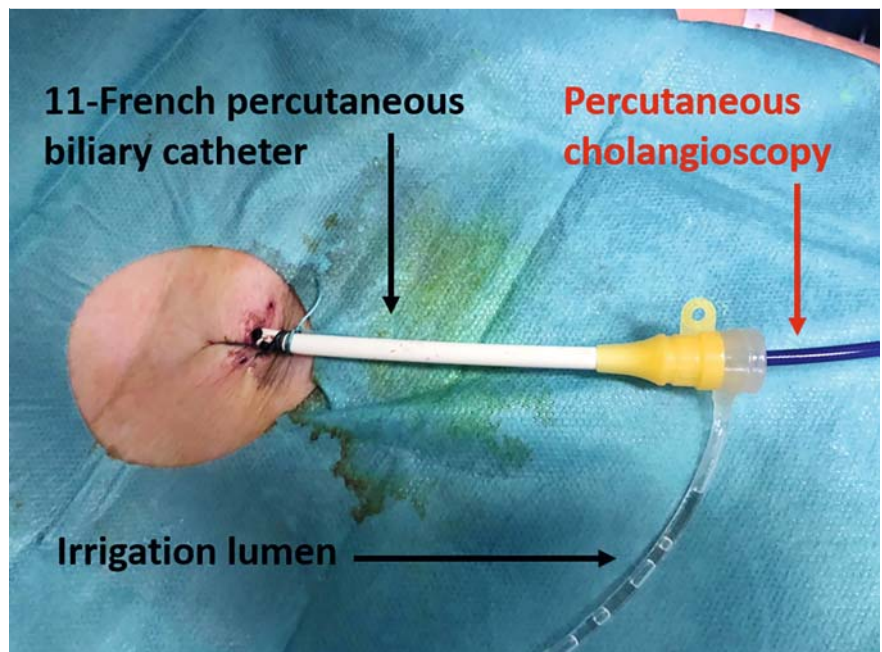
The endoscopic treatment of biliopancreatic disease in patients with altered surgical anatomy is challenging [1]. A 42-year-old woman who had previously undergone a standard Whipple procedure surgery because of duodenal adenocarcinoma presented with multiple large biliary stones and a symptomatic benign stricture of the hepaticojejunal anastomosis, detected by magnetic resonance imaging. Double-balloon enteroscopy failed to reach the hepaticojejunal anastomosis and hybrid radiological/endoscopic treatment was decided upon.

First, a 7-Fr percutaneous biliary drain was placed (► **Video 1**). Two days later, a double-lumen, 11-Fr introductory catheter was placed and percutaneous single-operator cholangioscopy-assisted electrohydraulic lithotripsy was carried out (SpyGlass DS, Boston Scientific, Marlborough, Massachusetts, USA) (► **Fig. 1**). Following stricture dilation to 13 mm (CRE, Boston Scientific), the fragmented stones were pushed into the lumen of the small bowel using an endoscopic retrograde cholangiopancreatography (ERCP) balloon. A new internal-external radiological drain was placed.

In a second session, the percutaneous drain was removed. A residual biliary stone (► **Fig. 2**) was gently pushed into the small bowel using a wire-guided anterograde balloon extractor. Thus, three 0.0035/0.0025-inch guidewires were placed through the hepaticojejunal stricture using the percutaneous tract (► **Fig. 3**). Three 10-Fr, 6-cm biodegradable stents (Archimedes, Medtronic, Dublin, Ireland) with a slow profile (11 weeks for biodegradation) were placed in parallel in the hepaticojejunal stricture (► **Fig. 4**), while the three guidewires were kept in place to allow repositioning if needed. A 7-Fr cannula was used as a pusher under radiological guidance. The patient was discharged 48 h later with no complications and no biliary symptoms at 1-month follow-up.



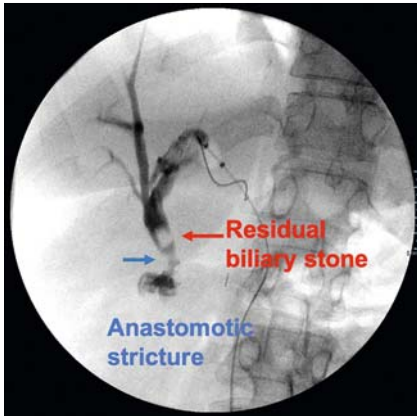
► **Video 1** A patient with previous Whipple surgery presented with biliary stones and a benign anastomotic stricture. Percutaneous single-operator cholangioscopy-assisted electrohydraulic lithotripsy was performed. Three biodegradable stents were placed.



► **Fig. 1** Percutaneous cholangioscopy-assisted electrohydraulic lithotripsy of large biliary stones through an 11-Fr catheter in a patient with previous Whipple surgery.

Biodegradable biliary stents are a new alternative in the management of benign biliary strictures. These stents have a he-

lical channel design and good fluoroscopic visibility [2]. Their main advantage is that they do not need to be ex-



► **Fig. 2** Residual biliary stone (red arrow) and stricture of the hepaticojejunal anastomosis (blue arrow).



► **Fig. 4** Radiological image of the three 10-Fr, 6-cm biodegradable stents successfully placed in parallel in the stricture of the hepaticojejunal anastomosis. The helical design is visible. Contrast is flowing into the small bowel.

changed. This feature can be extremely useful and can avoid more invasive procedures or major surgery in patients with altered surgical anatomy, as in the present case.

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Competing interests

The authors declare that they have no conflict of interest.



► **Fig. 3** Three guidewires placed in the hepaticojejunal stricture using the previous percutaneous biliary drainage tract. A 10-Fr biodegradable stent is visible.

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