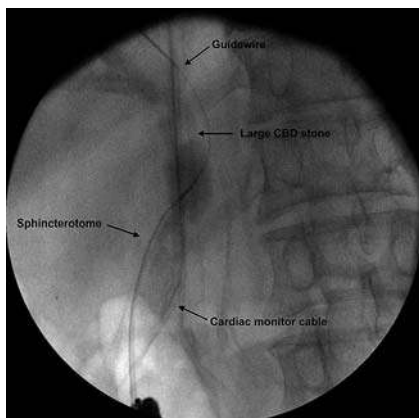


## Tips and tricks in the endoscopic management of a complex biliary stone in Billroth II gastrectomy



► **Fig. 1** Fluoroscopic imaging showing correct biliary duct cannulation.



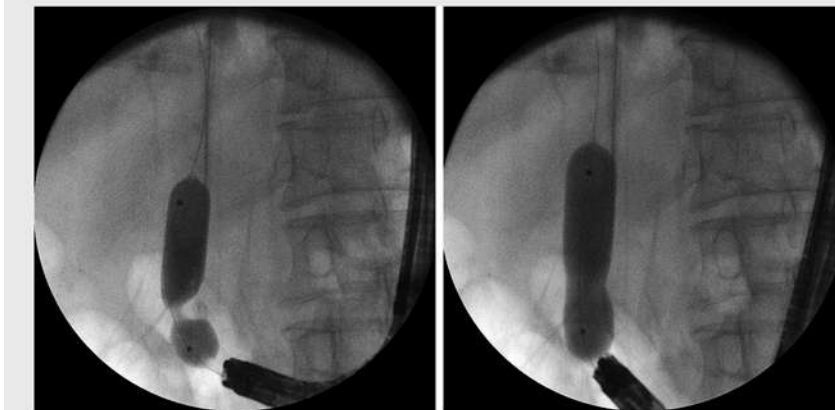
► **Fig. 2** Endoscopic visualization of through-the-scope balloon during large hydrostatic balloon dilation.

Post-surgical anatomy may make traditional endoscopic retrograde cholangiopancreatography challenging for the endoscopist. In patients with Billroth II gastrectomy, challenges include selective entrance to the afferent loop and cannulation of the common bile duct (CBD) due to the inverted position [1]. Endoscopic management of CBD stones may be especially difficult in these patients, especially those with complex biliary stones [2].

We present a case of a 67-year-old gentleman with a previous Billroth II gastrectomy due to peptic ulcer disease who presented with jaundice (total bilirubin 9.72 mg/dl, direct bilirubin 6.3 mg/dl)



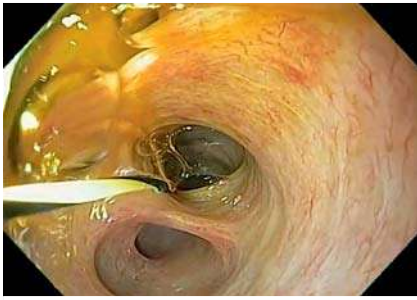
► **Video 1** Direct cholangioscopy as an alternative technique to treat complex biliary stones in Billroth II anatomy.



► **Fig. 3** Fluoroscopic imaging demonstrating the "radiological waist" and its disruption.

and abdominal pain. Imaging at this time with magnetic resonance cholangiopancreatography demonstrated extrahepatic bile duct dilation and a large distal CBD stone (1.6 cm × 1 cm). For this case, a standard gastroscope was chosen in favor of a duodenoscope to decrease potential adverse events such as perforation [3].

On initial endoscopy, the major papilla was found and the cannulation occurred without difficulty (► **Video 1**, ► **Fig. 1**). Fluoroscopy evaluation revealed a dilated CBD with a large biliary stone. The ideal position (5 o'clock) to perform sphincterotomy was not achieved. Therefore, a limited sphincterotomy was performed to guide the balloon dilation. Next, a large through-the-scope balloon dilation



► **Fig. 4** Final cholangioscopy demonstrated no residual stones.






(18 mm) was performed until disruption of the radiological “waist” (► **Fig. 2**, ► **Fig. 3**) [4]. Yet, despite several balloon sweeps, stone removal was unsuccessful. As a result, direct cholangioscopy with a standard gastroscope was then subsequently undertaken with the aim to improve the CBD axis and maximize traction force for stone extraction. The gastroscope was gently inserted into the ampulla and a large stone was visualized in the distal CBD. The stone was then removed using a balloon extraction technique without issue. Final cholangioscopy revealed no residual stones (► **Fig. 4**). No adverse events occurred. In summary, alternative endoscopic techniques to treat difficult stones are feasible, safe, and effective when appropriately selected [5].

Endoscopy\_UCTN\_Code\_TTT\_1AR\_2AH

### Competing interests

The authors declare that they have no conflict of interest.

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### Bibliography

Endoscopy

DOI 10.1055/a-1540-5956

ISSN 0013-726X

published online 2021

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

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