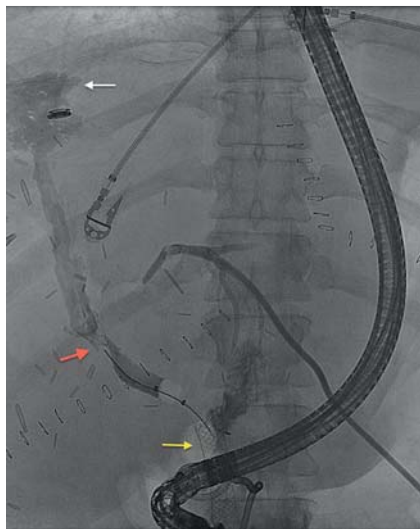
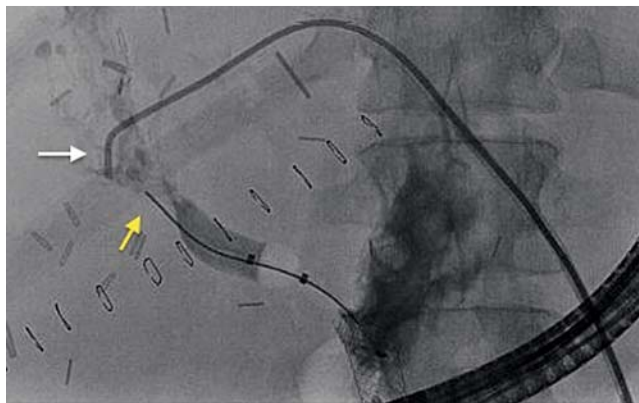


## A minimally invasive technique utilizing percutaneous and endoscopic rendezvous for successful treatment of a proximal bile leak following partial hepatectomy



**Fig. 1** Balloon occlusion cholangiogram obtained by passing a retrieval balloon through a fully covered self-expandable metallic biliary stent (yellow arrow) demonstrates a leak at the confluence of the left hepatic and common bile ducts (red arrow). Contrast is seen filling within a subhepatic collection (white arrow). Contrast in the left hepatic ducts is from concurrent percutaneous cholangiogram performed through an indwelling anchor drain.

A 43-year-old woman presented with a grade B [1] bile leak after right hepatectomy for metastatic colon cancer. She developed subhepatic bilomas which were managed with percutaneous drains. Endoscopic retrograde cholangiography (ERC) demonstrated a high-grade bile leak secondary to a large defect in the left hepatic duct, possibly due to complete dehiscence of the staple line of the right hepatic bile duct. Despite placement of a fully covered self-expandable metallic stent (SEMS), the bile leak persisted. Percutaneous transhepatic biliary drainage (PTBD) was attempted. The left hepatic duct was accessed in an antegrade fashion; however, the guidewire repeatedly entered the subhepatic space and could not be directed into the common bile duct. Simultaneous ERC and PTBD were performed. The leak (● Fig. 1) and discontinuity between the left hepatic duct and common bile duct was redemonstrated at ERC. A guidewire was advanced in a retrograde manner to the area just distal to the



**Fig. 2** A snare is passed antegrade through the left hepatic duct (white arrow) while a guidewire is passed retrograde through the common bile duct (yellow arrow).



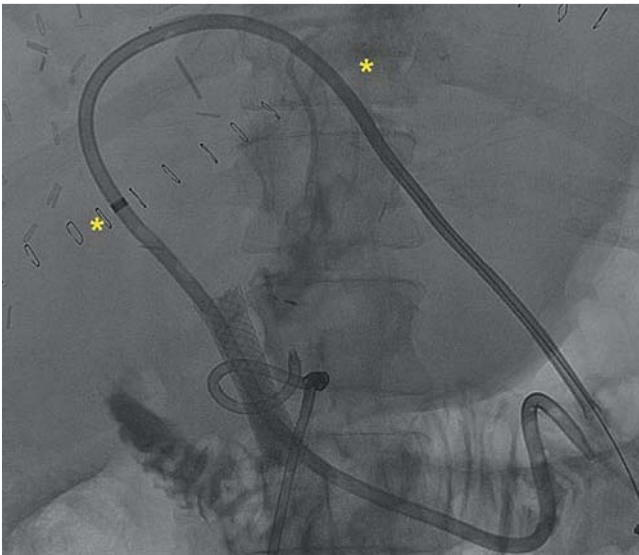
**Fig. 3** A snare is passed antegrade through the catheter within the left hepatic duct. The guidewire (yellow arrow) is grasped using a 15-mm snare (white arrow).

leak (● Fig. 2). A 15-mm snare (Amplatz GooseNeck, Covidien, Plymouth, Minnesota, USA) was advanced in an antegrade manner across the left hepatic duct defect to capture the wire (● Fig. 3) and pulled externally to secure biliary access. A percutaneous biliary drainage catheter was directed over the guidewire, through the SEMS, into the distal duodenum using endoscopic guidewire traction (● Fig. 4). The drain was customized with additional side holes which remained within the intrahepatic biliary tree but not in the region of the ductal defect (● Fig. 5). At 6-month follow-up, the subhepatic collections had resolved on imaging. Bile leaks occur in up to 10%–12% [1,2] of patients following hepatic surgery, and are a significant cause of postsurgical morbidity, prolonged hospital stay, and



**Fig. 4** The 12-Fr biliary drainage catheter is passed antegrade through the fully covered self-expandable metallic stent previously placed across the papilla (yellow arrow) and directed endoscopically toward the distal duodenum (white arrow).

mortality [2]. Indications for resection of colorectal cancer liver metastasis have expanded in recent times, leading to larger and more complex resections [3]. Pre-operative bevacizumab and surgical technique are independent predictors of bile leaks [2]. Establishing continuity between the biliary tree distal and proximal to the defect is crucial for successful treatment [4]. We describe successful establishment of biliary continuity using an ERC-PTBD rendezvous procedure (after failure of standard endoscopic techniques) to treat a large defect which obviated the need for repeat laparotomy.



**Fig. 5** The percutaneously placed 12-Fr biliary drainage catheter is advanced through the common bile duct while ensuring that side holes are not present in the region of duct discontinuity (in between yellow asterisks).

Endoscopy\_UCTN\_Code\_TTT\_1AR\_2AK

**Competing interests:** Payal Saxena has received consulting fees from Boston Scientific and research support from Cook Medical.

Mouen A. Khashab is a consultant for Boston Scientific and Olympus America and has received research support from Cook Medical.

Vikesh K. Singh is a consultant for Abbvie, Santarus, D-Pharm, and Boston Scientific. All other authors have no relevant conflicts of interest to disclose.

**Payal Saxena<sup>1</sup>, Adam Jeffers<sup>2</sup>, Sally E. Mitchell<sup>2</sup>, Timothy M. Pawlik<sup>3</sup>, Joanna K. Law<sup>1</sup>, Vivek Kumbhari<sup>1</sup>, Mouen A. Khashab<sup>1</sup>, Vikesh K. Singh<sup>1</sup>**

<sup>1</sup> Division of Gastroenterology, Johns Hopkins Medical Institutions, Baltimore, Maryland, USA

<sup>2</sup> Division of Interventional Radiology, Johns Hopkins Medical Institutions, Baltimore, Maryland, USA

<sup>3</sup> Department of Surgery, Johns Hopkins Medical Institutions, Baltimore, Maryland, USA

## References

- 1 Koch M, Garden OJ, Padbury R et al. Bile leakage after hepatobiliary and pancreatic surgery: a definition and grading of severity by the International Study Group of Liver Surgery. *Surgery* 2011; 149: 680–688
- 2 Guillaud A, Pery C, Campillo B et al. Incidence and predictive factors of clinically relevant bile leakage in the modern era of liver resections. *HPB (Oxford)* 2013; 15: 224–229
- 3 Mayo SC, Pulitano C, Marques H et al. Surgical management of patients with synchronous colorectal liver metastasis: a multicenter international analysis. *Am Coll Surg* 2013; 216: 707–716; discussion 716–708
- 4 Fiocca F, Salvatori FM, Fanelli F et al. Complete transection of the main bile duct: minimally invasive treatment with an endoscopic-radiologic rendezvous. *Gastrointest Endosc* 2011; 74: 1393–1398

## Bibliography

**DOI** <http://dx.doi.org/10.1055/s-0034-1365376>  
 Endoscopy 2014; 46: E212–E213  
 © Georg Thieme Verlag KG  
 Stuttgart · New York  
 ISSN 0013-726X

## Corresponding author

**Vikesh K. Singh, MD, MSc**  
 Johns Hopkins Hospital  
 Division of Gastroenterology  
 1830 E. Monument Street, Room 428  
 Baltimore  
 MD 21205  
 USA  
 Fax: +1-410-614-7631  
[vsingh1@jhmi.edu](mailto:vsingh1@jhmi.edu)