

Extra-anatomic “Rendezvous” Technique in Management of Biliary Complications Following Liver Surgery: A Technical Note

Abstract

We describe extra-anatomic “rendezvous” technique for the management of bile leak associated with biliary stricture following hepatic surgery in two patients. In the procedure, the endoscopic guidewire was snared from the biloma cavity and pulled through the percutaneous access allowing for a drain to be placed. Both procedures were technically successful.

Keywords: *Bile leak, biliary stricture, biloma, rendezvous*

Introduction

“Rendezvous” techniques are performed using two separate access sites and meet at a common point, with subsequent capture of the trailing end of one access wire with a snare catheter positioned through the second access site.^[1] These two access pathways could be endoscopic approach, percutaneous access, or surgical. Combined endoscopic-radiological “rendezvous” techniques can be used as an alternative to treat challenging cases of biliary stenosis and/or bile leaks when endoscopic or percutaneous access alone to the biliary system fails.^[1] We present two cases of bile leak associated with biliary stricture following hepatic surgery treated by extra-anatomic “rendezvous” technique.

Case Reports

Case 1

An 81-year-old man underwent a left hepatectomy extended to segments I and VIII for a hepatocellular carcinoma presented 2 months later with icteric cholestasis and worsening general condition. Contrast-enhanced computed tomography (CT) of the abdomen showed a 5-cm biloma at the hepatectomy margin [Figure 1a], in addition to a single tumor recurrence in the remaining right hepatic lobe [Figure 1b and c]. Magnetic resonance cholangiopancreatography (MRCP) showed a fine communication between the biloma and the slightly

dilated intrahepatic biliary ducts (IHD) with evidence of tight stricture of the right bile duct (RBD) [Figure 2]. Endoscopic retrograde cholangiopancreatography (ERCP) was attempted to drain the biliary collection, however, was not successful. The biloma was not visualized due to the very tight stenosis of the RBD [Figure 3a]. Percutaneous transhepatic cholangiography (PTC) was performed 2 days later to place an external-internal biliary catheter (EIBC). The cholangiogram revealed a biliary fistula from IHD feeding the biloma. The common biliary duct (CBD) could not be visualized due to the previously described RBD stenosis [Figure 3b] negating placement of an EIBC. A 8.5-F, 50-cm long, transhepatic external biliary drainage catheter (EBC) (Ultrahane ring biliary duct drainage catheter; Cook Inc., Bloomington, Indiana) was placed into the biloma. After multidisciplinary discussion, biliary drainage including biloma using a “rendezvous” technique was decided. The procedure was performed in the interventional radiology suite: equipped with a flat panel detector C-arm angiographic system (Allura Xper Clarity; Philips Healthcare, Best, The Netherlands). The endoscopist initiated the procedure by performing an ERCP, and the recently drained biloma was successfully catheterized this time with extreme difficulty, using a 0.035-inch, 300-cm long, angled hydrophilic guidewire (Radifocus Guidewire M; Terumo, Tokyo, Japan).

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The interventional radiologist also catheterized the biloma after removal of the EBC and positioning of an 8-F, 11-cm long introducer sheath (Radifocus Introducer sheath, Terumo) within the preexisting percutaneous access site [Figure 4a and b]. At this point, the endoscopist's guidewire was snared using a 6-F, 120-cm long, 20-mm snare-loop grasping catheter (Goose Neck Snare Kit; EV3, Plymouth, Minnesota) completing the "rendezvous" within the biloma [Figure 4c]. The snare was withdrawn through the biliary catheter [Figure 4d and e]. A 5-F, 65-cm-long Cobra catheter (Radifocus Glidecath; Terumo) was positioned through the percutaneous access [Figure 4f] and the hydrophilic guidewire was exchanged to a 0.035-inch, 145-cm long, straight tip guidewire (Amplatz Super Stiff; Boston Scientific Corporation, Natick, Massachusetts) [Figure 4g]. Finally, a 10-F, 50-cm long, external-internal transhepatic biliary drainage catheter (EIBC) (Ultrahane ring biliary duct drainage catheter; Cook Inc.) was successfully placed into the biliary system [Figure 4h]. Final cholangiogram showed correct positioning of the biliary catheter, draining simultaneously the CBD, and the biloma with good opacification of the duodenum (D2). No postprocedural complications were encountered. The patient was evaluated serially after the procedure, and no intrahepatic bile duct dilatation was noted. Jaundice resolved and serum bilirubin levels rapidly decreased. Abdominal CT showed complete resolution of the biloma after 1 month [Figure 5]. During the following 2 months, the EIBC was monthly upsized to 12 then 14-F catheters.

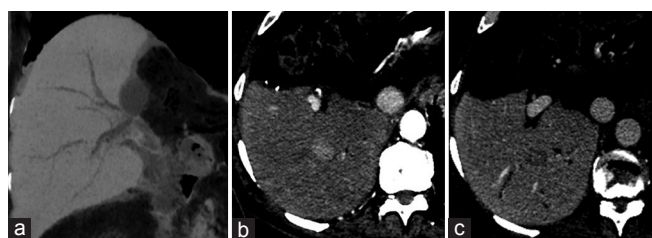


Figure 1: (a) Plain abdominal computed tomography in the coronal plane and in minimum intensity projection showing a biloma at the hepatectomy margin. (b and c) Enhanced abdominal computed tomography in the axial plane in arterial (b) and portal (c) phases showing a recurrent nodule of hepatocellular carcinoma in segment VII of the liver

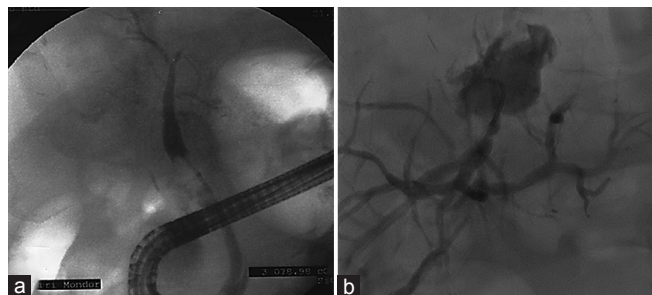


Figure 3: (a) The biloma was not visualized in endoscopic retrograde cholangiopancreatography due to the tight stenosis of the right bile duct. (b) The cholangiogram showed a bile leak with contrast extravasation into the biloma. The common biliary duct could not be visualized due to the right bile duct stenosis

The EIBC was not removed because of the cholestasis recurrence most likely due to carcinomatosis infiltration of the liver parenchyma. Three months after the "rendezvous" procedure, the patient was entrusted to his family under a palliative treatment because of his metastatic disease.

Case 2

An 82-year-old man underwent full-right liver split transplantation for alcohol-related cirrhosis complicated by upper gastrointestinal bleeding and hepatic encephalopathy. Postoperative period was uneventful. Three months later, routine CT showed a biloma at the section margin without dilatation neither of IHD nor of CBD [Figure 6]. MRCP showed a fine communication between the biloma and the IHD with evidence of a RBD stenosis [Figure 7]. The patient had no cholangitis. An ERCP was attempted to drain the biliary collection but was not successful. Neither the biloma nor the IHD was visualized. The patient developed



Figure 2: Magnetic resonance cholangiopancreatography showed a fine communication between the biloma and the slightly dilated intrahepatic biliary ducts (asteroid) with evidence of a right bile duct stenosis (head arrow)

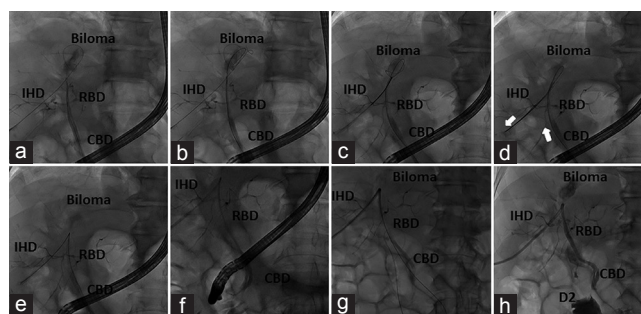


Figure 4: (a and b) The endoscopist guidewire catheterized the common biliary duct, the right hepatic duct, and then, the biloma. The interventional radiologist also catheterized the intrahepatic biliary ducts and the biloma. (c) The endoscopist's guidewire was snared by the snare loop catheter completing the "rendezvous" within the biloma. (d-f) A catheter was positioned through the percutaneous access after withdrawing the snare loop catheter. (g) The hydrophilic guidewire wire was changed to a stiff one. (h) An external-internal biliary catheter was placed into the biliary tree attested by the simultaneous opacification of the intrahepatic biliary ducts, the biloma, the right bile duct, the common biliary duct, and the D2

infection of the biloma with subsequent cholangitis. A PTC was performed to place an EIBC. The cholangiogram showed a bile leak into the biloma. The CBD could not be visualized due to a stenosis of the RBD [Figure 8a]. Hence, a 10-F, 50-cm long, EBC (Ultrahane ring biliary duct drainage catheter; Cook Inc.) was positioned into the biloma under ultrasound guidance [Figure 8b]. The multidisciplinary decision was to attempt a biliary drainage using a “rendezvous” technique. The procedure was technically similar to the one performed on the patient



Figure 5: Enhanced abdominal computed tomography in the axial plane (a) and sagittal plane (b) showing complete healing of the biloma at the hepatectomy margin

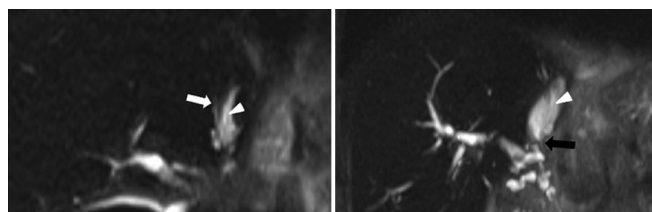


Figure 7: Magnetic resonance shows a fine communication (white arrow) between the biloma (white head arrow) and the intrahepatic biliary ducts with evidence of a right bile duct stenosis (black arrow)

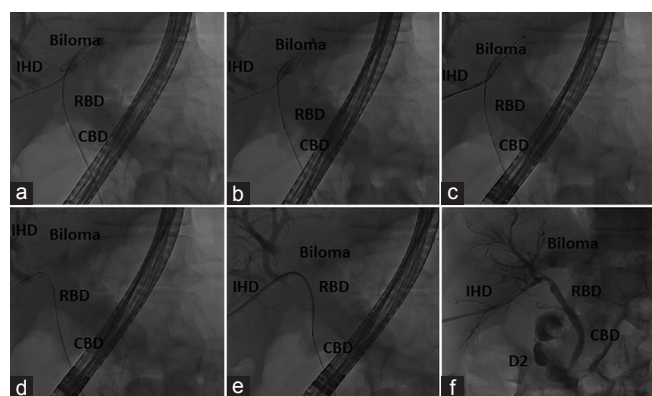


Figure 9: (a) The endoscopist guidewire catheterized the common biliary duct and the right bile duct and then the biloma. The interventional radiologist also catheterized the intrahepatic biliary ducts and the biloma. (b) The endoscopist’s guidewire was snared by a snare loop grasping catheter completing the “rendezvous” within the biloma. (c and d) The snare was withdrawn through the biliary catheter. (e) A catheter was positioned through the percutaneous access. (f) A external-internal biliary catheter was placed into the biliary tree as shown by the simultaneous opacification of the intrahepatic biliary ducts, the biloma, the right bile duct, the common biliary duct, and the D2

described under Case 1 [Figure 9a-f]. No postprocedural complications were encountered. The patient was evaluated serially and monthly after the procedure, and no IHD dilatation was noted. Jaundice resolved and serum bilirubin levels rapidly decreased. Abdominal CT showed complete healing of the biloma after 1 month [Figure 10]. During the following 2 months, the EIBC was monthly replaced with larger caliber catheters (12-F and 14-F) and then removed



Figure 6: Enhanced abdominal computed tomography in the axial plane showing the biloma at the hepatectomy margin



Figure 8: (a) Cholangiogram showed a bile leak with contrast extravasation into the biloma. The common biliary duct could not be visualized due to a right bile duct stenosis. (b) Enhanced abdominal computed tomography in the axial plane showing a 10-F EBC positioned into the biloma

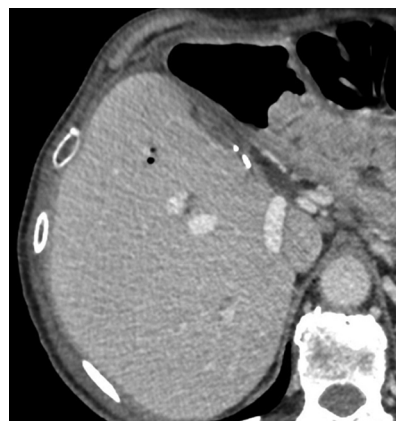


Figure 10: Enhanced abdominal computed tomography in the axial plane showing healing of the biloma at the hepatectomy margin

3 months after the procedure. The 6-month regular follow up did not show any bile leak recurrence.

Discussion

Bile leaks and strictures after hepatic surgery are a serious complication requiring rapid and adapted management. Nonsurgical treatment (endoscopic or radiological percutaneous treatment) usually shows good results and avoids surgery. In challenging cases of bile leaks and strictures when separate endoscopic or percutaneous access to the biliary system fails, the technique of “rendezvous” combining the two approaches makes it possible to overcome the difficulties of catheterization specific to each technique.^[2,3] The endoscopic-radiological “rendezvous” technique is defined as a procedure combining endoscopic and percutaneous biliary drainage, allowing the passage of a guidewire and consequently a catheter through a biliary obstacle, thus restoring the normal flow.

This technique was described in the treatment of postoperative bile leaks and strictures, common bile duct stone, intrahepatic stone, and posttraumatic biliary fistulas.^[2-5]

Commonly, the “rendezvous” technique takes place in the duodenum, even in the duodenal bulb, unlike the present case where the wire was snared from the biloma. Typically, this procedure must be followed by a biliary dilatation using a progressively increasing biliary drain caliber followed by the withdrawal of the drain when biliary anatomy is restored.

“Rendezvous” technique is associated with high technical success close to 100%. Morbidity ranges from 10% to 13% and mortality is almost zero.^[1-3,6,7] Recurrence rate ranges from 19% to 20%, and it is comparable to the recurrence rate of percutaneous treatment.^[8-10]

Conclusion

We demonstrate the feasibility and safety of extra-anatomic endoscopic-radiological “rendezvous” technique in the management of postoperative bile leak and stricture. This procedure should restore biliary continuity in patients with bile leak and stricture avoiding additional difficult surgery with high morbidity.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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