



Cholangioscopy-guided double-guidewire technique for complex malignant hilar obstruction

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Most patients with hilar cholangiocarcinoma are unresectable at initial presentation, and endoscopic stent placement is widely performed for palliation.¹ Normalization of bilirubin is associated with improved survival, and draining more than half of the liver volume is associated with fewer episodes of cholangitis.² Obtaining optimal liver drainage typically requires a single stent in patients with Bismuth type I to II strictures and multiple stents in patients with Bismuth type III to IV strictures, while avoiding atrophic liver segments.² Digital single-operator cholangioscopy is recognized to be a useful tool to aid selective guidewire placement in complex hilar strictures.³

A 77-year-old man presented to our institution with jaundice, right upper quadrant pain, loss of appetite, and weight loss. Blood tests confirmed a raised bilirubin level (8.6 mg/dL), abnormal liver function test results (alkaline phosphatase 320 IU/L, aspartate aminotransferase 86 IU/L, alanine aminotransferase 66 IU/L), and a significantly elevated CA19-9 level (3426 U/mL). Cross-sectional imaging by magnetic resonance imaging showed intrahepatic biliary dilation above a hilar mass, with multiple solid liver lesions suggestive of metastases.

Linear EUS revealed thickening of the common bile duct with a 19-mm hilar mass (Fig. 1; Video 1, available online at www.giejournal.org). Because this patient had metastatic disease and would not be a transplant candidate, FNA was performed with a 25-gauge needle. At ERCP, selective biliary cannulation was achieved with a sphincterotome preloaded with a 0.025-inch guidewire.



Figure 1. An 18- × 19-mm hilar mass seen on linear EUS.

To visualize the stricture, a single-operator cholangioscope was advanced over the wire into the extrahepatic bile duct. The mucosa of the distal bile duct was relatively normal, but in the common hepatic duct the lumen narrowed and the mucosa became irregular and nodular with neovascularization, highly suggestive of a malignant stricture (Fig. 2).^{4,5} Biopsy forceps were advanced through the cholangioscope to obtain further tissue samples for pathology.

When the cholangioscope was advanced further into the stricture, the origin of the right anterior and right posterior ducts could be visualized. This patient had a Bismuth type IIIa stricture, and based on prior radiology review that revealed a relatively atrophic left lobe of the liver, our pre-procedural aim was to insert 2 stents into the right anterior and right posterior ducts to optimize biliary drainage. The first wire preferentially went into the right anterior ducts. Recognizing that cannulation of the right posterior duct would be challenging without cholangioscope visualization and that reintroducing the cholangioscope via the endoscope working channel once a guidewire was already in situ would be impossible, we elected to place a

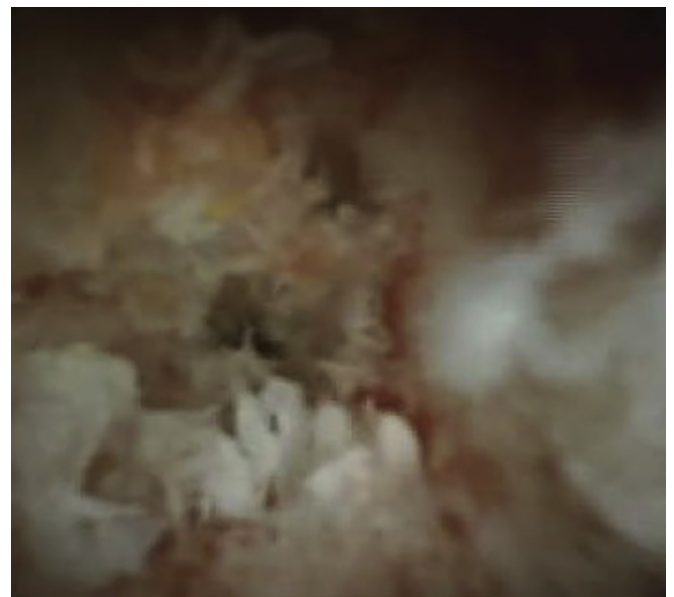


Figure 2. Cholangioscopic view of the malignant hilar stricture with irregular nodular mucosa, neovascularization, and narrowing of the lumen.

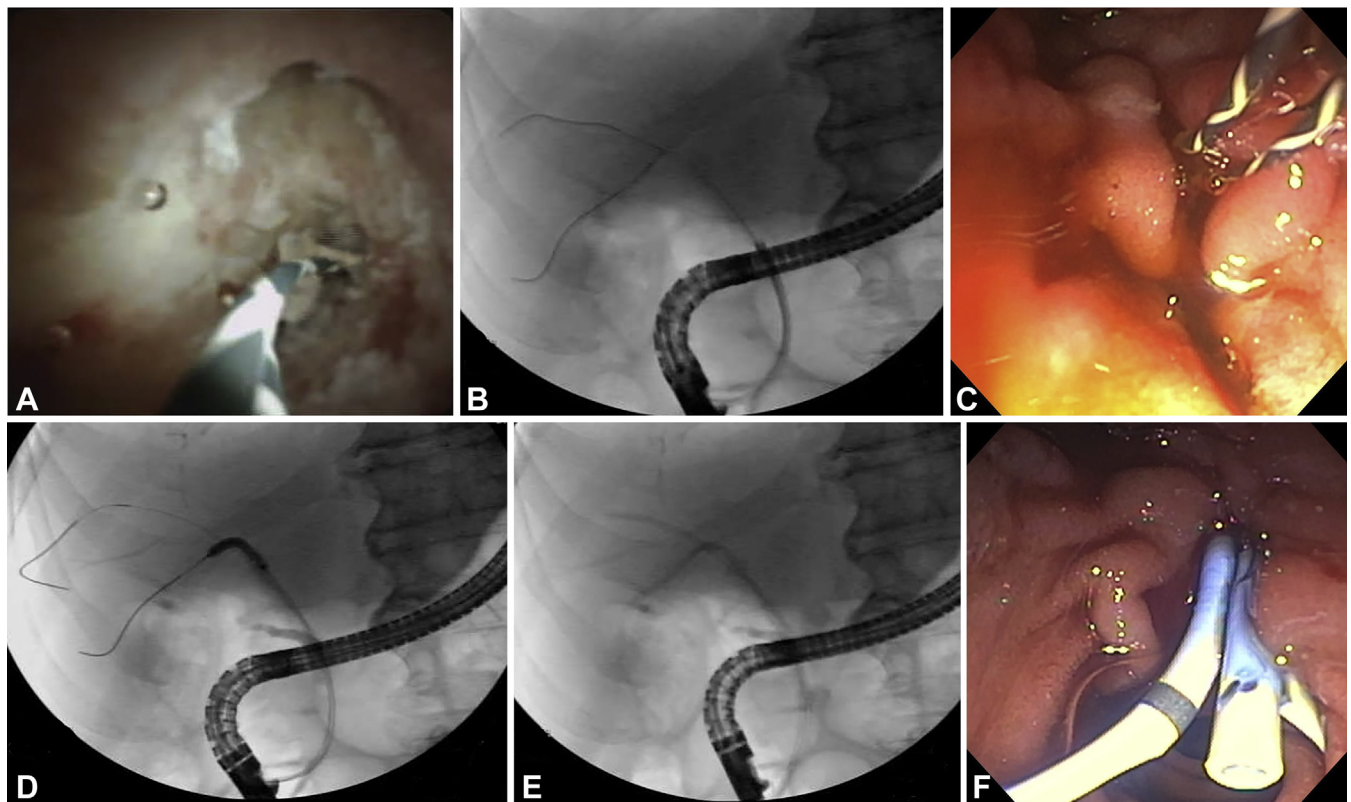


Figure 3. Cholangioscopy-guided double-guidewire technique for bilateral hilar stenting **A**, Cholangioscopic view of two 0.025-inch guidewires exiting the cholangioscope. **B**, Fluoroscopic image confirming guidewire position in the right anterior and right posterior ducts, after cholangioscope-assisted selective cannulation. **C**, Endoscopic view after cholangioscope exchange, with both guidewires seen exiting the papilla. **D**, Serial dilation of the hilar stricture with a 4-mm dilation balloon. **E**, Fluoroscopic image confirming placement of two 7F, 12-cm biliary stents. **F**, Endoscopic view after bilateral stent placement.

second hydrophilic 0.025-inch guidewire through the cholangioscope, alongside the first guidewire (Fig. 3A). Using cholangioscopy, we could visualize the origin of the right posterior duct to enable successful selective segmental wire placement (Fig. 3B, Video 1). The cholangioscope was then successfully exchanged over the 2 wires (Fig. 3C). The stricture was segmentally dilated (Fig. 3D) and two 7F, 12-cm straight plastic biliary stents were placed (Fig. 3E). The stents were in a good position at the end of the procedure, draining contrast and bile (Fig. 3F).

In conclusion, in addition to aiding tissue acquisition and defining tumor extent, single-operator cholangioscopy can direct dual 0.025-inch guidewire placement for selective cannulation in complex hilar strictures.

DISCLOSURE

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