# Percutaneous single-operator cholangioscopy-assisted antegrade biliary recanalization with over-the-wire 3F microcatheter manipulation

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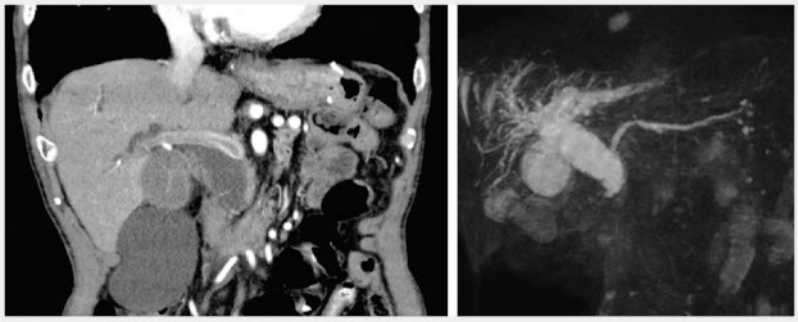


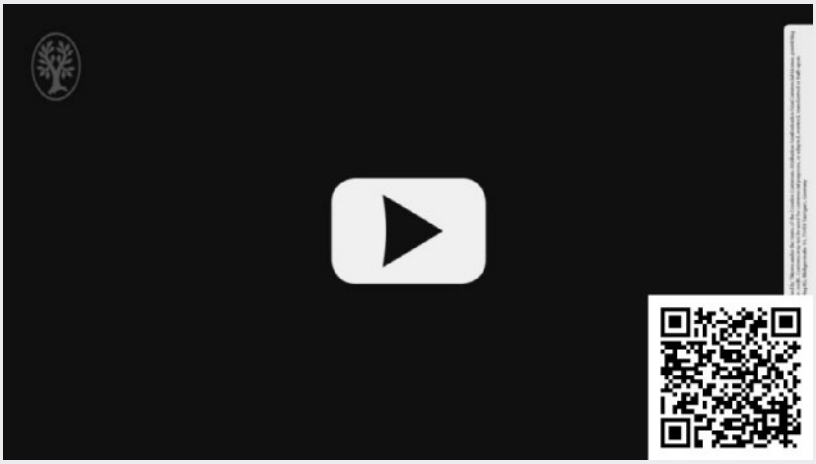
▶ **Fig. 1** Contrast-enhanced computed tomography and magnetic resonance cholangiopancreatography revealed obstructive jaundice due to recurrent lymph node metastasis.

▶ **Fig. 2** Fluoroscopic cholangiogram via the percutaneous transhepatic route. The contrast injection and guidewire could not pass through the stenosis under fluoroscopic imaging.

Endoscopic retrograde biliary drainage is a major procedure for malignant biliary obstruction (MBO). However, in unsuccessful cases, percutaneous transhepatic biliary drainage (PTBD) or endoscopic ultrasound-guided biliary drainage (EUS-BD) are considered as alternatives. In PTBD, biliary recanalization is preferable from the perspective of physiological bile flow, but there are cases in which passing the guidewire through the MBO is difficult. Here, we report a case in which percutaneous antegrade biliary endoprosthesis with cooperative manipulation of cholangioscopy and a 3F microcatheter for MBO was successful.

An 89-year-old man who had previously undergone gastrectomy and Billroth II reconstruction for gastric cancer was admitted with obstructive jaundice due to recurrent lymph node metastasis (▶ **Fig. 1**). Biliary drainage using double-balloon enteroscopy was performed but resulted in failure due to postoperative adhesion. The intrahepatic and common bile duct was distant from remnant stomach, so PTBD was selected instead of EUS-BD. We succeeded in approaching the MBO via the percutaneous transhepatic route, but the contrast agent and guidewire could not pass through the stenosis under fluoroscopic imaging (▶ **Fig. 2**). After temporal external fistulization, we percutaneously applied a disposable digital single-operator cholangioscopy (SpyGlassDS Direct Visualization System; Boston Scientific Corp., Natick, Massachusetts, United States). The cholangioscope could reach the stenosis, but guidewire manipulated under direct visualization still could not pass through the MBO. A 3F microcatheter (Daimon-ERCP-catheter, Hanaco Medical, Saitama, Japan) was applied through the cholangioscope. The coordinated maneuver enabled guidewire to advance to the

VIDEO



▶ **Video 1** Cooperative manipulation of cholangioscopy and 3F microcatheter-enabled successful percutaneous antegrade biliary endoprosthesis with super-selective manipulation of the guidewire.

duodenum. Finally, a drainage tube (Dawson-Mueller Drainage Catheter; Cook Medical, Bloomington, Indiana, United States) was successfully placed through the stricture for endoprosthesis (▶ **Video 1**).

Percutaneous cholangioscopy for selective guidewire placement has been reported as a troubleshooting technique [1, 2, 3], but in this case, passing guidewire through the obstruction required super-selective manipulation of guidewire with better pushability and trackability. The over-the-wire 3F microcatheter applied via the cholangioscope not only allowed for injection of a contrast medium but also provided greater stability for selective guidewire manipulation.

## Conflict of Interest

The authors declare that they have no conflict of interest.

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