

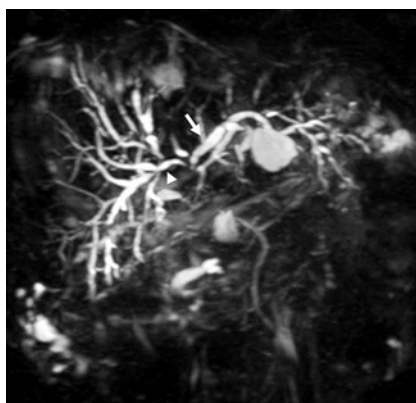
## Successful guidewire placement across hilar malignant biliary stricture after deceased donor liver transplantation using new digital cholangioscopy

A 70-year-old man with metastatic rectal cancer was referred to our department for endoscopic management of obstructive jaundice due to metastatic lymph nodes. He previously received deceased donor liver transplantation with duct-to-duct biliary reconstruction. Computed tomography and magnetic resonance cholangiopancreatography showed hilar biliary stricture due to metastatic lymph nodes at the duct-to-duct anastomosis (► Fig. 1, ► Fig. 2). Endoscopic retrograde cholangiopancreatography revealed a markedly dilated recipient bile duct and a stricture of the donor hepatic duct (► Fig. 3). Multiple attempts to pass the hilar stricture using a 0.035-inch hydrophilic guidewire and a cannula or a rotatable sphincterotome failed because a guidewire easily advanced to the remnant cystic duct just below the stricture. Hence, after endoscopic sphincterotomy, guidewire passage using SpyGlass DS Direct Visualization System (SpyDS; Boston Scientific Japan, Tokyo, Japan) was attempted. Cholangioscopy allowed direct visualization of both torturous biliary stricture with non-tumorous mucosa and the wide-opening remnant cystic duct (► Fig. 4). A guidewire was readily passed through the stricture into the left intrahepatic duct under SpyDS and fluoroscopy guidance (► Fig. 5). Given the presence of high-grade hilar biliary stricture, bilateral metal stent placement in a partially stent-in-stent method was successfully performed with rapid resolution of jaundice (► Fig. 6).

Selective guidewire placement across biliary stricture can be technically challenging, especially in patients after liver transplantation or with hilar biliary stricture [1,2]. To our knowledge, this is the first report demonstrating the utility of SpyDS for guidewire placement across complex hilar malignant biliary stricture at the anastomotic site after liver trans-



► Fig. 1 Computed tomography showed metastatic hilar lymph nodes (arrow).



► Fig. 2 Magnetic resonance cholangiopancreatography revealed a high-grade hilar biliary stricture with a dilated left hepatic duct (arrow) and right posterior hepatic duct (arrow head).

plantation. Although several studies reported the effectiveness of cholangioscopy-assisted guidewire placement [3–5], its success rate was unsatisfactory. The SpyDS has potential advantages over the original Spyglass system: its better image quality, irrigation and 4-way steering. In summary, SpyDS-assisted guidewire passage can be an alternative technique after failed guidewire passage under fluoroscopic guidance.

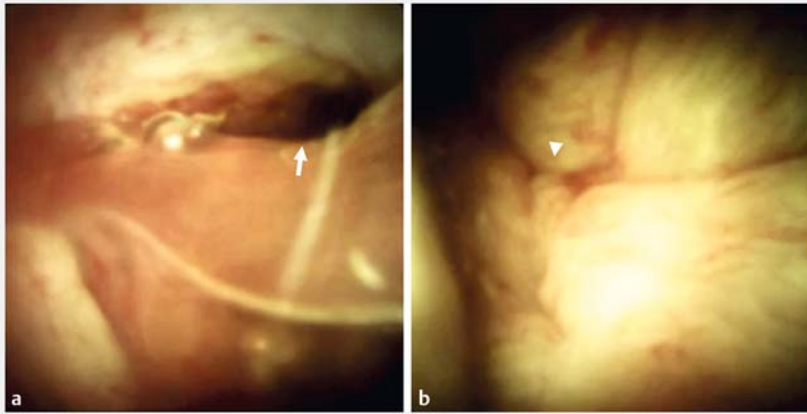
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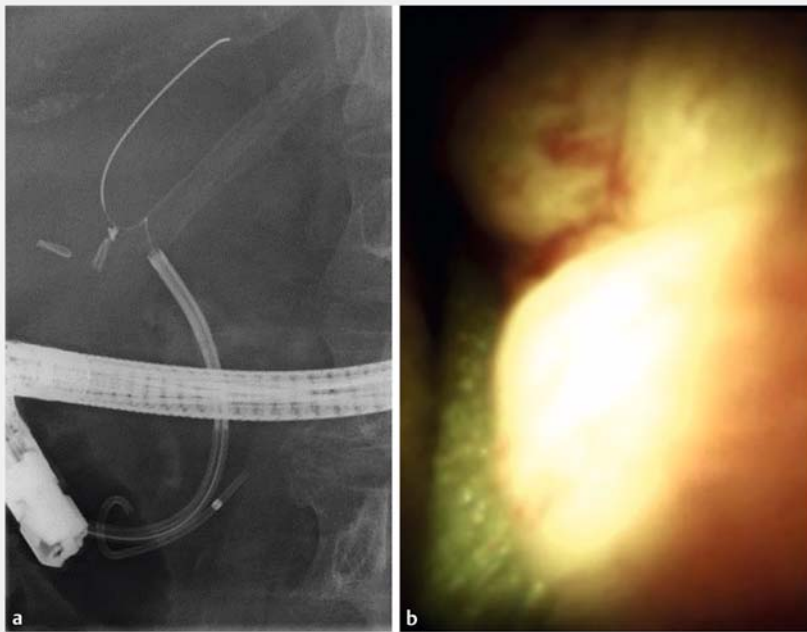
► Fig. 3 Cholangiogram confirmed hilar biliary stricture. The remnant cystic duct and left hepatic duct were visualized after contrast injection (arrow).

### Competing interests

None



► **Fig. 4** The images of SpyGlass DS Direct Visualization System. **a** The orifice of a remnant cystic duct (arrow). **b** The distal end of biliary stricture was visualized without a tumor-appearing mucosa (arrow head).



► **Fig. 5** Guidewire passage under direct visualization. **a** Fluoroscopic image of guidewire placement across the stricture. **b** Guidewire manipulation under direct visualization of SpyDS.

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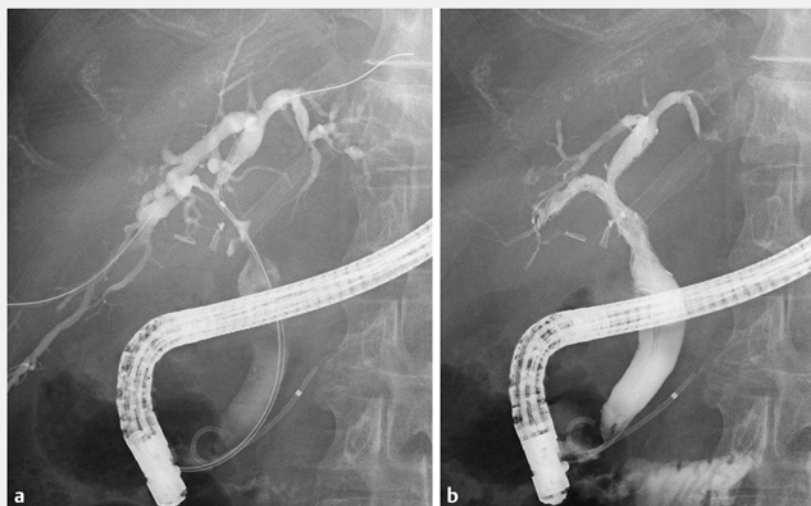
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► **Fig. 6** Fluoroscopic images of stent placement. **a** Cholangiogram revealed high-grade hilar biliary stricture. **b** Bilateral metal stent was performed in a partially stent-in-stent method.



► **Video 1** Successful guidewire placement across hilar malignant biliary stricture under direct visualization using SpyGlass DS Direct Visualization System in a patient after deceased donor liver transplantation.



## Bibliography

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