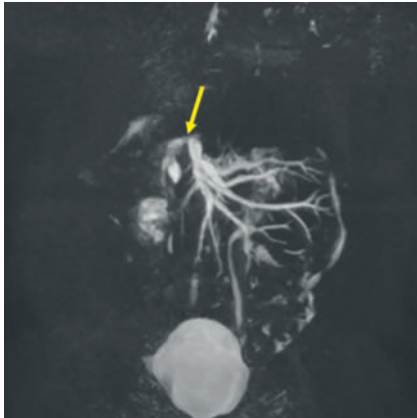


Recanalization of occluded biliary intestinal anastomosis through utilizing percutaneous transhepatic cholangioscopy for a 2-year-old patient after liver transplantation

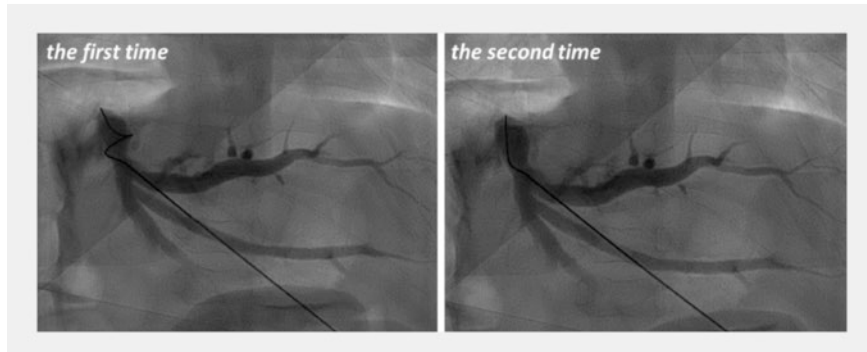
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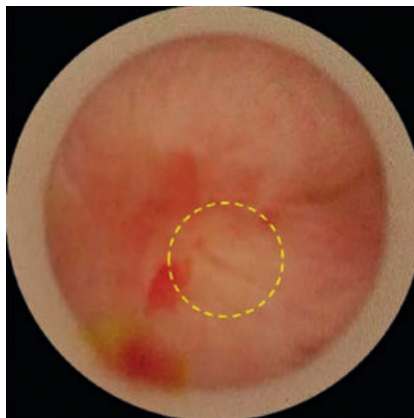
► **Fig. 1** Magnetic resonance cholangiopancreatography showed a stricture of the biliary intestinal anastomosis (yellow arrow).

A 2-year-old girl with a history of liver transplantation for biliary atresia was admitted with recurrent fever and jaundice. Magnetic resonance cholangiopancreatography (► **Fig. 1**) showed a stricture of the bilioenteric anastomosis. Two attempts at percutaneous transhepatic cholangiography drainage (PTCD) failed (► **Fig. 2**). Percutaneous transhepatic cholangioscopy (PTCS) was therefore applied to provide direct visualization of any intraductal lesions or confirm a benign stricture, which is generally observed as having a smooth mucosal surface, tapered luminal narrowing, short stricture segment, and the absence of neovascularization [1] (► **Video 1**).

To minimize the patient's radiation dose exposure, ultrasound was used instead of interventional radiography to evaluate the intrahepatic bile ducts. The guidewire was inserted through the PTCD sinus, followed by sequential dilation of the tract until a 16-Fr sheath could be placed. A rigid cholangioscope was inserted under the guidance of the guidewire, and the completely obstructed bilioenteric anastomotic site was then directly visualized after clearing the hepatolithiasis

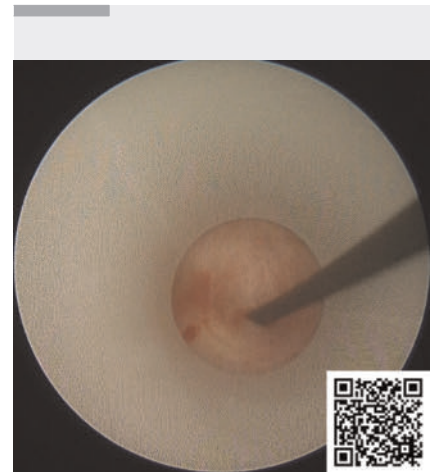


► **Fig. 2** In both percutaneous transhepatic cholangiography drainage (PTCD) procedures, the guidewire failed to pass through the anastomosis due to severe narrowing.



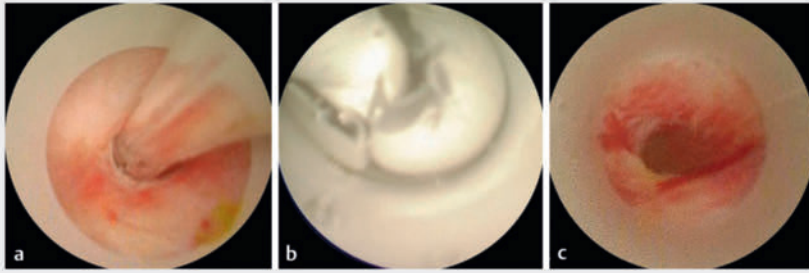
► **Fig. 3** The obstructed anastomosis (yellow dashed circle) was observed under the direct visualization of the rigid cholangioscope.

(► **Fig. 3**). The guidewire was passed through the anastomosis after repeated attempts. Balloon dilation was performed repeatedly until significant dilation of the anastomosis was achieved (► **Fig. 4**). The intraoperative cholangiography confirmed the disappearance of the occluded biliary intestinal anastomosis, with good transition of contrast medium from bile ducts to bowel (► **Fig. 5**). Finally, a 16-Fr bile drainage tube was placed through the anastomosis to support and drain. There were no postopera-



► **Video 1** The recanalization of occluded biliary intestinal anastomosis was successfully performed under the direct visualization of percutaneous transhepatic cholangioscopy (PTCS) for the 2-year-old patient after failed percutaneous transhepatic cholangiography drainage (PTCD).

tive complications and the patient was discharged 3 days after surgery. Anastomotic stricture is a common complication after liver transplantation [2]. PTCD has become the preferred choice for most patients given the changes in anatomical structure [3]. Compared with PTCD, PTCS has the advantages of oper-



► **Fig. 4** The balloon was used to repeatedly dilate the narrow tracts until there was a noticeable dilation at the anastomotic site. **a** The balloon was placed through the anastomosis. **b** The pressure of the balloon was maintained at 8 bar for 1 minute for continuous expansion. **c** The originally narrow anastomosis showed significant dilation after multiple expansions.



► **Fig. 5** The intraoperative cholangiography confirmed the disappearance of the occluded biliary intestinal anastomosis, with good transition of contrast medium from bile ducts to bowel.

ating under direct vision and reducing the radiation exposure [4], and it has been widely used in adults with biliary-enteric anastomotic strictures [5]. This study demonstrated that PTCS might also be a safe and feasible minimally invasive treatment for anastomotic stricture following pediatric liver transplantation.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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