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Summary

DEVELOPMENT AND CLINICAL APPLICATION OF A NOVEL CATHETER WITH A STEERABLE TIP USING ARTIFICIAL BLOOD VESSEL MATERIAL FOR ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY

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A newly developed wire-driven bidirectional steerable catheter using artificial blood vessel material demonstrated superior bending performance and faster biliary cannulation compared to conventional catheters in ERCP for patients with Roux-en-Y hepaticojejunostomy.

KEY POINTS

- The novel catheter achieved biliary duct cannulation in four patients with Roux-en-Y cholangiojejunostomy where conventional steerable catheters failed.
- Mean time for guidewire insertion in the unilateral bile duct was 18.8 ± 10.1 seconds with the new catheter versus 94.1 ± 42.1 seconds with the conventional catheter, a statistically significant difference ($p < 0.05$).
- The catheter could bend over 90 degrees bidirectionally with a minimum bending radius of about 4 mm, approximately five times smaller than conventional steerable catheters.
- The device uses a seamless tube with a PTFE body and porous expanded PTFE distal tip (15 mm), with minimum tube diameter 2.1 mm and distal tip diameter 1.4 mm, controlled by two loop-formed wires.
- No catheter-related complications occurred in the clinical evaluation of four patients requiring endoscopic treatment for conditions including acute cholangitis.

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