

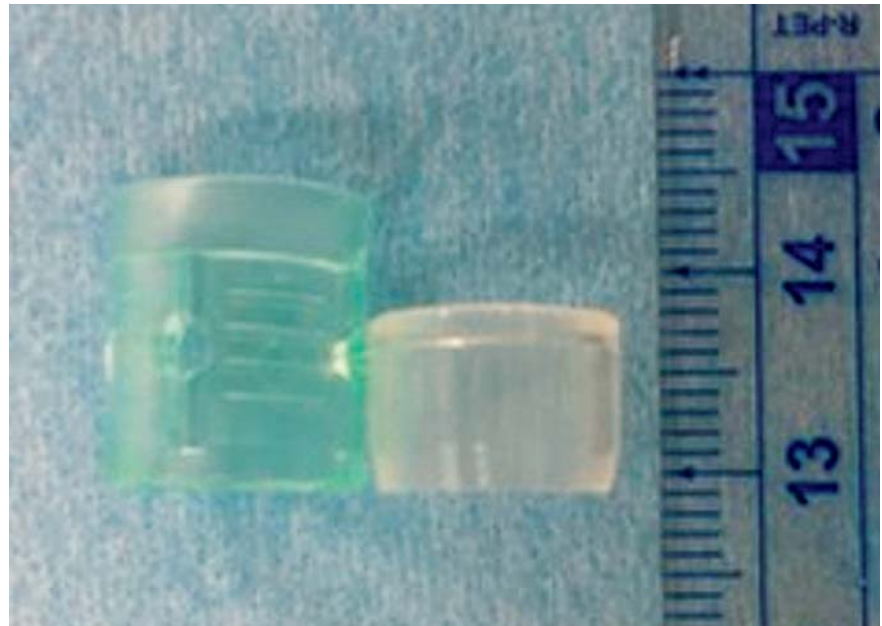
Endoscopic approach for a pinhole-like benign stenosis in a pancreaticojejunal anastomosis using a double-balloon endoscope with a clear long cap attachment



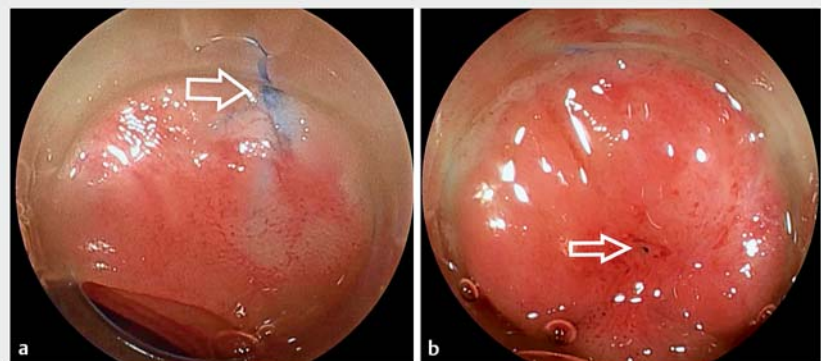
► **Fig. 1** Image from a preprocedure computed tomography scan showing mild pancreatic duct dilatation.

The usefulness of therapeutic modalities using double-balloon endoscopy for biliary disease in postoperative patients has been widely reported [1–3], while papers published about its use in pancreatic disease are scarce, despite an increasing demand for such treatment. This is the first report of successful double-balloon endoscopy-assisted endoscopic retrograde pancreatography (DB-ERP) using a clear long cap for a pinhole-like benign stricture in the pancreaticojejunal anastomosis after pancreaticoduodenectomy.

A 63-year-old woman who had undergone pancreaticoduodenectomy for a lower bile duct cyst with abnormal confluence suffered recurrent pancreatitis 1 year after surgery. Obstructive pancreatitis due to stenosis in the pancreaticojejunal anastomosis was suspected on imaging (► **Fig. 1**). The main pancreatic duct (PD) was mildly dilated, which posed a risk for intervention by endoscopic ultrasound (EUS), so we decided to perform DB-ERP instead. A clear long cap (► **Fig. 2**) was attached in an attempt to make any endoscopic maneuvers smoother. The expected advantages of this were: to allow it to be pressed against the intestinal wall, so that even sutures covered by mucosa could be easily detected; to allow the pancreaticojejunal anastomosis to be shown in the vertical direction, instead of the normal tangential direction;



► **Fig. 2** Photograph showing the difference between the clear long cap (left) and a conventional cap (right).



► **Fig. 3** Endoscopic views showing: **a** the suture (arrow) fixing the pancreas and jejunum; **b** a scar-like ulcer in the mucosa, with a pinhole-like stenosis of the pancreaticojejunal anastomosis at its center (arrow).

to allow a certain distance to be maintained between the endoscope and the pancreaticojejunal anastomosis, which would enable smooth endoscopic procedures and blind maneuvers to be avoided.

First, the pancreaticojejunal anastomosis was identified by fluoroscopic image, and the sutures fixing the pancreas and jejunum were then detected endoscopically (► **Fig. 3 a**). By careful observation in the area of the sutures, the scar-like



Video 1 A double-balloon endoscope with a clear long cap attached is successfully used to identify a pinhole-like benign stenosis in a pancreaticojejunal anastomosis, which then allowed pancreatography and deep cannulation to be successfully performed, prior to anastomotic dilation and pancreatic duct stenting.

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mucosa and the pinhole-like stricture of the pancreaticojejunal anastomosis were successfully identified (► **Fig. 3 b**). Pancreatography and deep cannulation were performed successfully, and were followed by anastomotic dilation and PD stenting (► **Video 1**). Following the successful completion of DB-ERP, the patient was discharged on the fourth day, without experiencing any major complications or any further pancreatitis. EUS intervention is reported to be effective for pancreatic diseases [4, 5], yet it is invasive for postoperative cases and only used selectively. In conclusion, double-balloon endoscopy approaches can be safely used in patients with a mildly dilated PD, and DB-ERP using a clear long cap is effective for pancreaticojejunal anastomosis stenosis in symptomatic patients.

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Competing interests

The authors declare that they have no conflict of interest.

The authors

Takeshi Kasai^{1,2}, **Masaaki Shimatani**^{1,2}, **Toshiyuki Mitsuyama**^{1,2}, **Takeshi Yamashina**^{1,2}, **Masataka Kano**^{1,2}, **Takakuni Yuba**^{1,2}, **Makoto Naganuma**²

- 1 Division of Gastroenterology and Hepatology, Kansai Medical University Medical Center, Moriguchi, Osaka, Japan
- 2 The Third Department of Internal Medicine, Kansai Medical University, Hirakata, Osaka, Japan

Corresponding author

Masaaki Shimatani, MD, PhD

Division of Gastroenterology and Hepatology, Kansai Medical University Medical Center, 10-15, Fumizono-cho, Moriguchi, Osaka, 570-8507, Japan
shimatam@hirakata.kmu.ac.jp

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