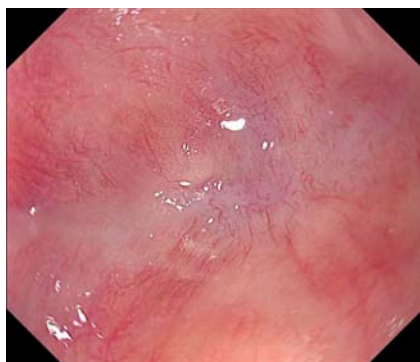


Gel immersion echoendoscope-guided puncture before radial incision and cutting for complete rectal anastomotic obstruction

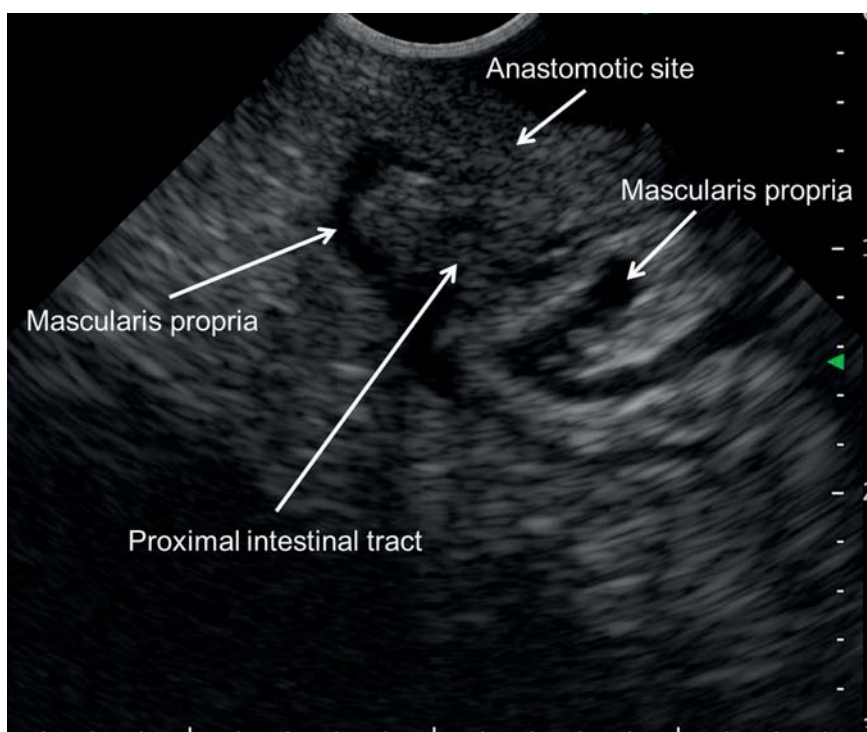
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► **Fig. 1** The site of the lower rectal anastomosis at 2 cm from the anal verge.

Benign anastomotic complete obstruction rarely occurs after lower rectal cancer surgery [1]. The radial incision and cutting (RIC) method has been reported for complete rectal anastomotic obstruction [2]; however, it is important to penetrate the distal and proximal sides of the intestinal tract safely and accurately before RIC. A forward-viewing echoendoscope is useful for recanalizing post-operative biliary anastomotic atresia in endosonography-guided biliary drainage because it allows a more vertical approach and shortens the puncture distance [3, 4]. Furthermore, gel-immersion techniques have been reported for endoscopic procedures [5].

A 59-year-old man underwent intersphincteric resection and temporary ileostomy for lower rectal cancer. Ileostomy closure was scheduled for 12 months after the surgery. Endoscopic imaging revealed complete rectal anastomotic obstruction 2 cm from the anal verge (► **Fig. 1**). We attempted an endoscopic intervention to avoid a surgical procedure.

A forward-viewing convex echoendoscope (TGF-UCT260J; Olympus Medical Systems, Tokyo, Japan) and immersed gel (VISCOCLEAR; Otsuka Pharmaceutical



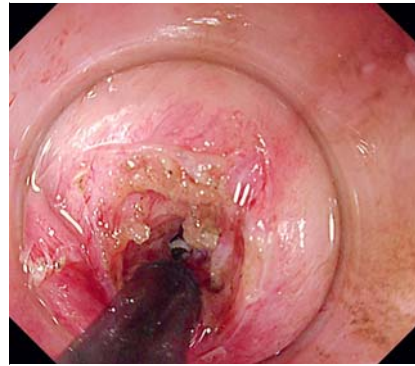
► **Fig. 2** Gel immersion endoscopic ultrasound view clearly showed the proximal intestinal tract.



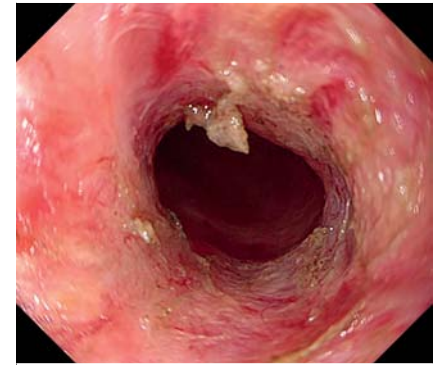
► **Video 1** Gel immersion forward-viewing echoendoscope-guided puncture before radial incision and cutting with endoscopic balloon dilation for complete rectal anastomotic obstruction.



► **Fig. 3** Fluoroscopic view of endoscopic dilation using a 4-mm biliary dilation balloon catheter until the notch disappeared.



► **Fig. 4** The radial incision and cutting method using an ITknife nano (KD-611L; Olympus Medical Systems, Tokyo, Japan).



► **Fig. 5** After the radial incision and cutting procedure, an endoscope with a 9.9 mm diameter could pass through the anastomotic site.

Factory, Tokushima, Japan) was inserted through the anus. Gel immersion provided a clear endoscopic ultrasound view and helped identify the puncture line (► **Fig. 2**). We inserted a 19-gauge needle (EZ Shot 3 plus; Olympus Medical Systems) toward the proximal intestinal tract (► **Video 1**). We confirmed patency of the proximal lumen using contrast enhancement and placed a 0.025-inch guidewire (VisiGlide 2; Olympus Medical Systems). Dilation was performed using a 4-mm biliary dilation balloon catheter (REN; Kaneka Medix Corp., Osaka, Japan) until the notch disappeared (► **Fig. 3**), and performed RIC using an ITknife nano (KD-611L; Olympus Medical Systems) (► **Fig. 4**). After the procedure, an endoscope with a 9.9 mm diameter could penetrate the anastomotic site (► **Fig. 5**). Forward-viewing echoendoscope-guided puncture using gel immersion before RIC with endoscopic balloon dilation is a safe and effective procedure for resolving anastomotic obstructions after lower rectal surgery.

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Competing interests

The authors declare that they have no conflict of interest.

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