Gastroduodenal anastomotic insufficiency: pull-through technique for endoscopic negative pressure therapy with new types of open-pore drains

A 61-year-old man underwent distal gastric resection with gastroduodenal anastomosis (Billroth I operation) because of perforated peptic ulcer and septic peritonitis. In addition, ischemic right colon was resected and ileostomy was performed. Anastomotic insufficiency was detected 2 days after the operation by duodenal secretions in the operative drainage tube. In two repeat laparotomies, operative closure of the leak could not be achieved. On postoperative Day 12, endoscopy showed a semicircular anastomotic leak (Fig. 1). The drain could be seen through the defect from the inside. Endoscopic negative pressure therapy (ENPT) was initiated immediately.

We used two new types of drainage devices: open-pore polyurethane foam drainage (OPD) and open-pore film drainage (OFD) (Fig. 2) [1–4]. For construction, the distal ends of a 12 Fr and an 18 Fr drainage tube (t) were connected using a suture (S). Open-pore polyurethane foam (P) was fixed in the middle for open-pore polyurethane foam drainage (OPD), and thin open-pore film (OF) was fixed in the middle of the drain for open-pore film drainage (OFD).

Pull-through technique with new types of open-pore drains

Video 1 Demonstration of the pull-through technique, construction of the open-pore polyurethane foam drain (OPD) and removal of an open-pore film drain (OFD).
The pull-through technique (▶ Video 1) along the preformed fistula channel in the anastomotic defect, with one half lying inside the cavity and the other half inside the intestinal lumen (▶ Fig. 3). The correct position was controlled endoscopically. The cutaneous end of the tube was blocked with a knot, and the proximal end was led out through the nose and connected to an electronic vacuum pump (Vac, –125 mmHg), and the cutaneous end of the tube was blocked (B). D, duodenum; S, stomach; F, cutaneous fistula opening.

The biliary secretion stopped immediately from the cutaneous end, and was drained intraluminally with negative pressure. Simultaneously, the defect and the fistula channel collapsed around the open-pore element of the drain (▶ Fig. 4). The last period of ENPT was performed using OPD, which was placed intraluminally, completely covering the defect zone. Drains were changed six times. The duration of ENPT was 24 days. The defect healed without further operation (▶ Fig. 5).

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