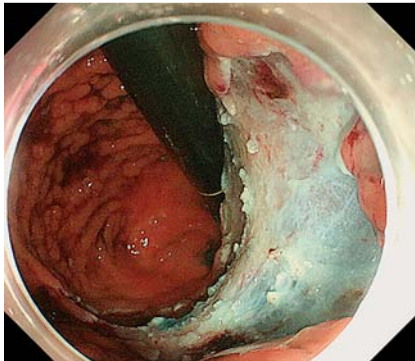


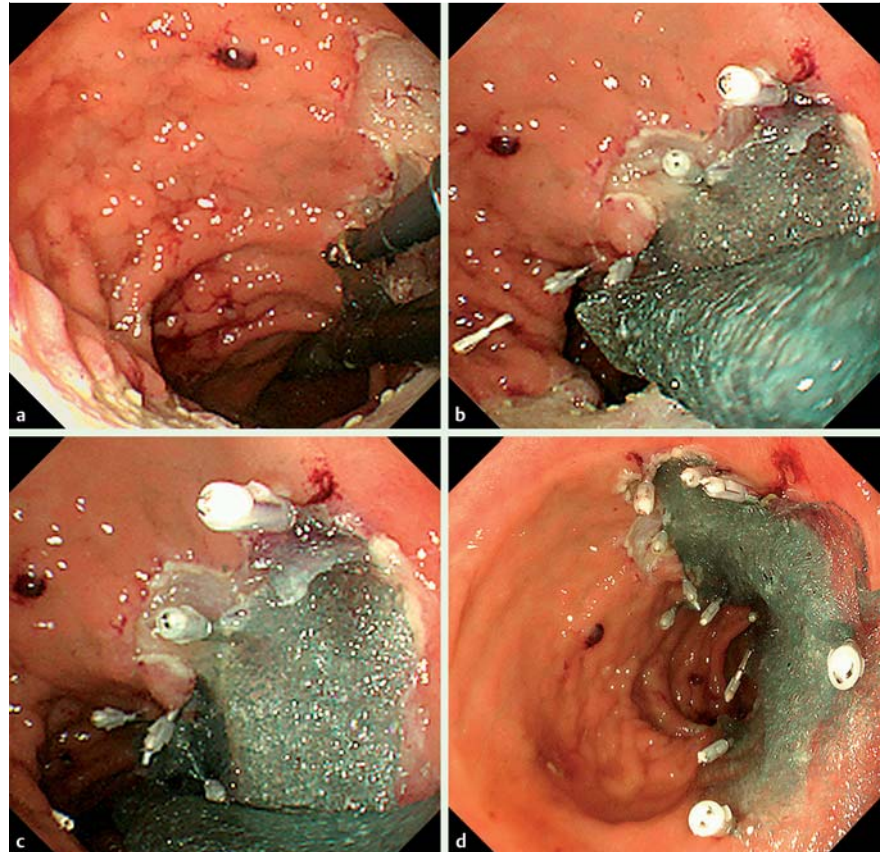
## A new technique for delivering a polyglycolic acid sheet to cover a large mucosal defect: the Swiss roll method



**Fig. 1** A large artificial ulcer was present after piecemeal endoscopic mucosal resection.

Endoscopic tissue shielding with polyglycolic acid (PGA) sheets (Neoveil; Gunze Co., Kyoto, Japan) and fibrin glue (Beriplast P CombiSet; CSL Behring Pharma, Tokyo, Japan) is a promising method for preventing postoperative complications [1–3]. However, this technique is thought to be inefficient for covering large mucosal defects because it takes time to deliver many small PGA sheets. Accordingly, we devised and implemented a new technique involving the delivery of a single large PGA sheet.

A 25-year-old woman with familial adenomatous polyposis was treated using a standard-caliber endoscope by rectal piecemeal endoscopic mucosal resection, leaving a large mucosal defect (● Fig. 1). For our new technique, we used a PGA sheet and its accompanying plastic packaging sheet. We cut the PGA sheet to cover the artificial ulcer, and then we cut the plastic sheet to a slightly smaller size. We attached one edge of the plastic sheet to a small-caliber endoscope with tape. Next, we placed the PGA sheet over the plastic sheet, and we proceeded to roll the two layers around the small-caliber endoscope like a Swiss roll, making sure the PGA sheet was on the outside. We placed the enwrapped small-caliber endoscope inside an overtube (Flexible Overtube; Sumitomo Bakelite Inc., Tokyo, Japan) to prevent contact with any moisture. We delivered the second endoscope within the overtube to the ulcer and then removed the overtube. Using the biopsy



**Fig. 2** Endoscopic view showing the Swiss roll method for application of a polyglycolic acid (PGA) sheet to cover an artificial ulcer. **a** One end of the PGA sheet was grasped using the main endoscope's biopsy forceps. **b** The end of the PGA sheet was fixed to one edge of the ulcer with clips. **c** The PGA sheet was unrolled over the ulcer. **d** The artificial ulcer was covered with a single large PGA sheet, which was fixed to the remaining edges of the ulcer using several clips.

forceps of the standard-caliber endoscope, we grasped one end of the PGA sheet (● Fig. 2a) and fixed it to one edge of the ulcer with clips (● Fig. 2b). We proceeded to unroll the PGA sheet over the ulcer (● Fig. 2c). The plastic sheet underneath gradually separated from the PGA sheet and remained curled around the small-caliber endoscope. We then fixed the PGA sheet using several clips (● Fig. 2d). This technique can be used to achieve the delivery of a single large PGA sheet to cover a sizeable mucosal defect.

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**Competing interests:** None

**Kunihiro Tsuji, Hisashi Doyama, Hiroyoshi Nakanishi, Kazuhiro Matsunaga, Shinya Yamada**

Department of Gastroenterology, Ishikawa Prefectural Central Hospital, Kanazawa, Japan

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#### Corresponding author

**Kunihiro Tsuji, MD**  
Department of Gastroenterology  
Ishikawa Prefectural Central Hospital  
2-1 Kuratsuki-higashi, Kanazawa  
Ishikawa 920-8530  
Japan  
Fax: +81-76-2385366  
[kt98052@yahoo.co.jp](mailto:kt98052@yahoo.co.jp)