

Efficacy of polyglycolic acid and fibrin glue to prevent esophageal stricture after endoscopic submucosal dissection in an animal model.

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Abstract:

Background: Endoscopic submucosal dissection (ESD) is widely performed for superficial esophageal cancer, but esophageal stricture is a major postoperative complication in cases with larger mucosal defects. A pilot study has reported the potential of polyglycolic acid and fibrin glue (PGAFG) for preventing esophageal stricture (22th UEG Week, Berlin, Abstract No. p491), albeit in a small number of patients. The mechanism, however, is unknown because only basic research has been undertaken thus far. Here, we investigated the efficacy of PGAFG for preventing esophageal stricture after ESD in an animal model. **Methods:** We resected 4 cm lengths of mucosa circumferentially from the middle to lower esophagus by ESD in 6 pigs (pigs 1 to 6) under general anesthesia. No PGAFG was applied in pigs 1 or 2 and PGAFG was applied in pigs 3 to 6; a PAG sheet was placed over about half of the circumference in pigs 3 and 4 and over the entire circumference in pigs 5 and 6. Liquid meal was given on the day after ESD, and an ordinary diet was resumed on day 3. Esophageal stricture was checked by endoscopic observation 1 week after ESD. Differences were determined between the pigs in relation to time to complete circumferential resection, time for PGAFG placement, change in weight, and dietary intake status after ESD. An EG-450RD5 endoscope (Fujifilm, Tokyo Japan) was used during all procedures. **Results:** The endoscope could not pass through the artificial ulcer because of esophageal stricture in pigs 1 and 2 in which no PGA was placed and no fibrin glue was sprayed. In contrast, the endoscope passed through to the stomach in Pigs 3-6. A small piece of PGA sheet was confirmed to remain in Pig 6. The average time for circumferential resection was 37.7 (range, 29-52) min and the average time for

PGAFG placement was 36.5 (17-62) min. The average time for PGAFG placement in pigs 3 and 4 was 17 min, compared to 56 min in pigs 5 and 6. Pig 3 received fluids intravenously because of poor intake. Pigs 4 and 5 gained more than 2 kg by 1 week after ESD. Conclusions: This animal study shows that PGAFG has the potential to prevent esophageal strictures in cases of circumferential mucosal defects. Histological assessment is under investigation, and those results will be reported in the presentation session.