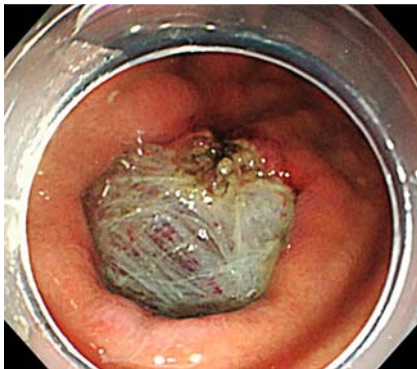


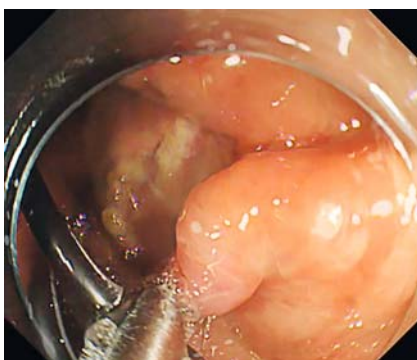
Successful mucosal closure of artificial gastric ulcer with twin grasping forceps and endoclips after endoscopic submucosal dissection



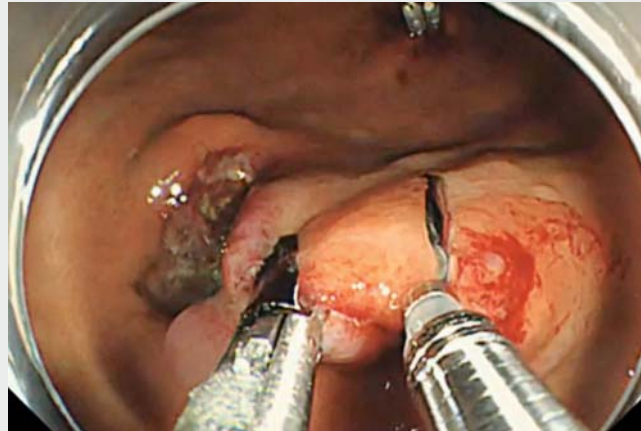
► **Fig. 1** Early gastric cancer (tumor diameter 3 mm) located in the greater curvature of the upper body of the stomach.



► **Fig. 2** Endoscopic submucosal dissection was performed and resulted in a mucosal defect (diameter 20 mm).



► **Fig. 3** The two arms of the Twin Grasper were used to grasp and appose both edges of the artificial ulcer.

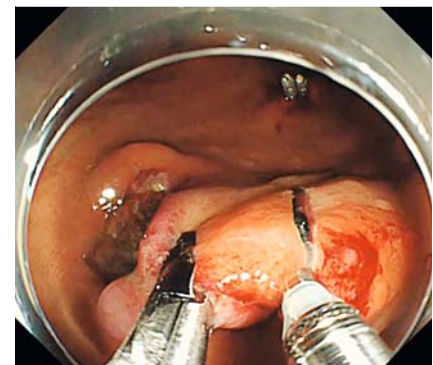


► **Video 1** Twin grasping forceps and endoclips used for successful mucosal closure of artificial gastric ulcer after endoscopic submucosal dissection.

The risk of postoperative adverse events following endoscopic resection can be reduced through endoscopic closure of the artificial gastric ulcer [1], but it is not easy owing to the gastric wall thickness and hardness. There are several methods for closing ulcers induced by gastric endoscopic submucosal dissection (ESD) [2–5]. Here, we describe the successful simple closure of a post-gastric ESD artificial ulcer using twin grasping forceps (Twin Grasper; Ovesco Endoscopy AG, Tübingen, Germany) and endoclips (EZ clip; Olympus, Tokyo, Japan).

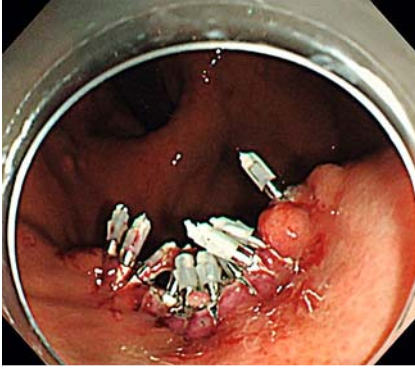
An 89-year-old man with early gastric cancer (upper part of the gastric greater curvature) underwent ESD that resulted in a mucosal defect (artificial gastric ulcer, diameter 20 mm) (► **Fig. 1**, ► **Fig. 2**) that was subsequently closed as follows (► **Video 1**).

(1) A double-channel endoscope (GIF-2TQ260M; Olympus) was inserted to visualize the mucosal defect in a straight view. (2) A Twin Grasper was inserted through the first channel and rotated.



► **Fig. 4** The sheath of the Twin Grasper was drawn to pull both the grasped edges of the ulcer into the crotch of the EZ clip, and clip closure was performed.

One arm grasped the edge of the ulcer, then the other arm grasped opposite edge, and the two sides of the ulcer contacted completely (► **Fig. 3**). (3) An EZ clip inserted through the second channel was rotated into an appropriate position and the sheath of the Twin Grasper was drawn to pull both of the grasped edges of the ulcer into the crotch of the clip,



► **Fig. 5** Complete closure was performed in 11.7 min.

where they were closed (► **Fig. 4**). (4) These steps were repeated until the defect was completely closed (procedure duration 11.7 min) (► **Fig. 5**). The patient was discharged 5 days after ESD without adverse events.




The advantage of the abovementioned Twin Grasper and EZ clip-based mucosal defect closure method is that the Twin Grasper enables the apposition of ulcer edges as though undertaken manually and facilitates defect closure under direct visualization. Therefore, this easy closure method will be one of the effective and safe options for closing a post-ESD artificial gastric ulcer.

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Competing interests

The authors declare that they have no conflict of interest.

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