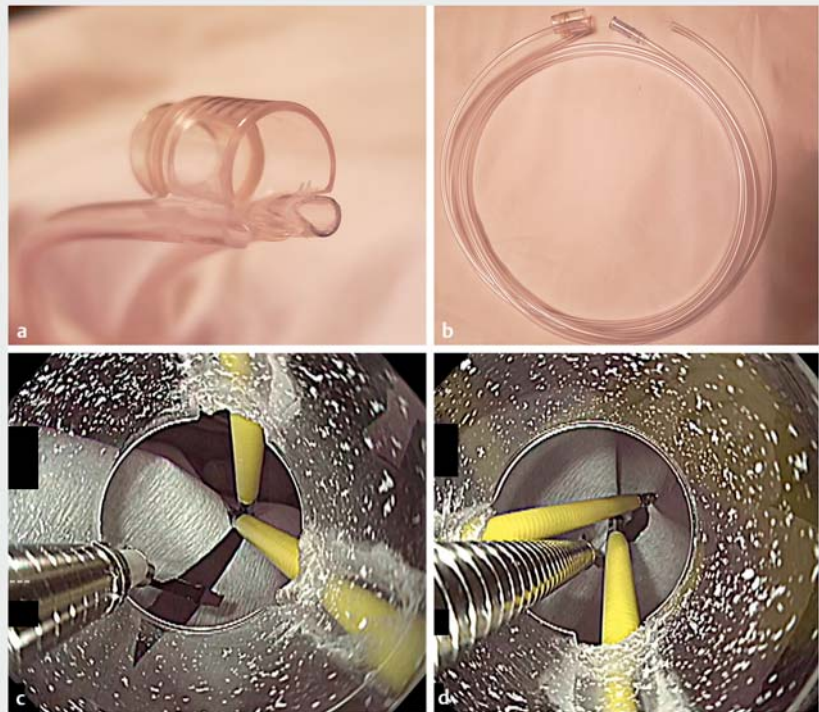


Mucosal suturing method after gastric endoscopic submucosal dissection using self-made transparent "cross-hood" attachment

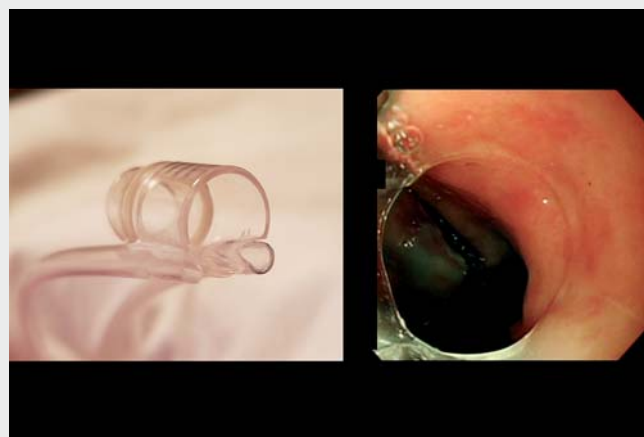
The ulcer floor after endoscopic submucosal dissection (ESD) sometimes becomes so large that several defect closure techniques have been reported [1–4] to prevent delayed bleeding or perforation. We developed a new device named the "cross-hood" that makes it easier to close a large mucosal defect after ESD.

This cross-hood was constructed with a long hood (MH-462; Olympus, Tokyo, Japan) and two Impact Shooters (TOP Corp, Tokyo, Japan). We shaved the tip of the hood, and then completed this device by attaching severed outer tubes of the Impact Shooters to the hood (► **Fig. 1 a, b**; ► **Video 1**). It is important to attach each tube to the hood so that the long axis of each tube is crossed (► **Fig. 1 c, d**). We report a case of successful closure of the large mucosal defect after gastric ESD using the cross-hood (► **Video 1**). The lesion was 10 mm in diameter and was located at the lesser curvature of the antrum (► **Fig. 2 a**). The lesion was completely resected en bloc (► **Fig. 2 b**). The size of the mucosal defect after ESD was approximately 35 mm (► **Fig. 2 c**). First we held the left side edge of the mucosal defect with grasping forceps from the right side of the outer channel; consequently we held the right side edge of the mucosal defect with grasping forceps from the left side of the outer channel. Thus, the two grasping forceps crossed and grasped the opposite side edges of the mucosal defect (► **Fig. 3 a, b**). By pulling both grasping forceps, both side edges of the mucosal defect were drawn together and closed using a conventional clip (► **Fig. 3 c**). Finally, we completed the closure (► **Fig. 3 d**). The ulcer floor was completely closed (► **Fig. 2 d**).

The cross-hood requires making a special device, but it does make closing large mucosal defects easy without a special technique. Closure of a large post-ESD defect with the cross-hood is feasible and useful.



► **Fig. 1** The self-made "cross-hood" device. **a** Shaved tip of the hood. **b** Severed outer tubes for attachment. **c** Attachment direction with the two outer channels on the same side as the inner channel. **d** Attachment direction with the two outer channels on the opposite side of the inner channel.



► **Video 1** Mucosal suturing method after gastric endoscopic submucosal dissection using self-made transparent "cross-hood" attachment.

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Competing interests

The authors declare that they have no conflict of interest.

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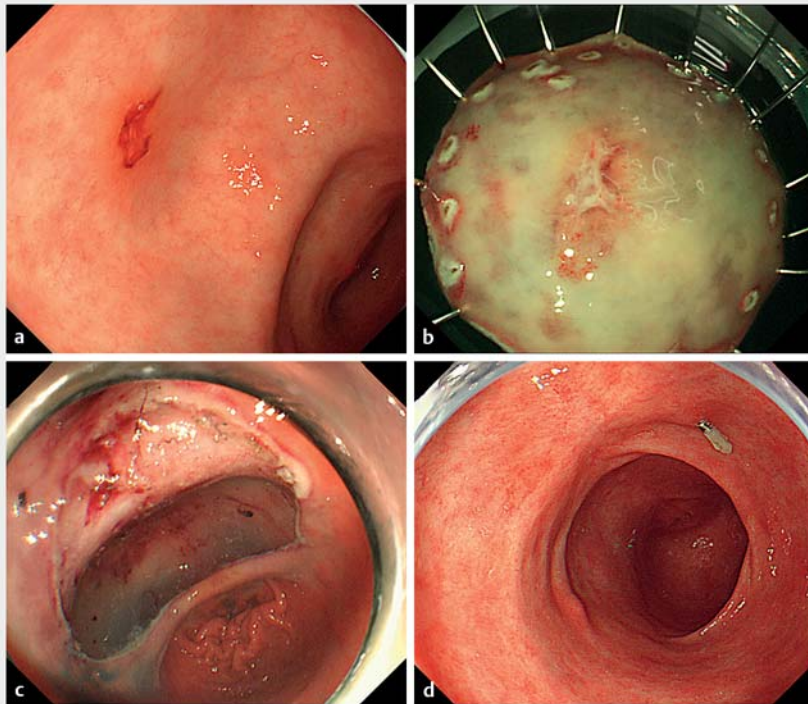
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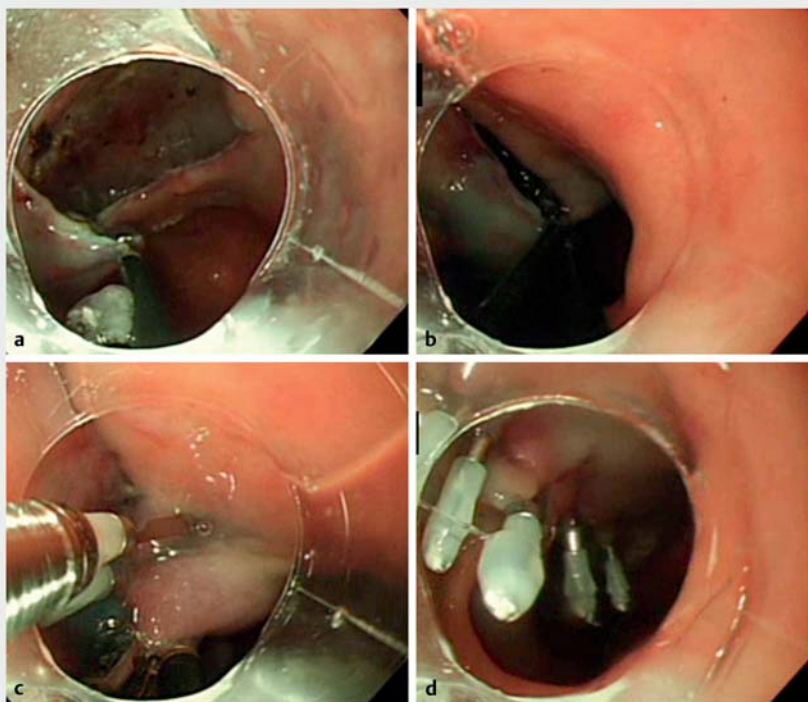
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► **Fig. 2** **a** The lesion was 10 mm in diameter and located at the lesser curvature of the antrum. **b** The lesion was completely resected en bloc. **c** The size of the mucosal defect after endoscopic submucosal resection was approximately 35 mm. **d** The ulcer floor was completely closed.



► **Fig. 3** **a, b** Two grasping forceps were crossed and grasped the opposite side of the edges of the mucosal defect. **c** By pulling both grasping forceps to the endoscope, both side edges of the mucosal defect were drawn together and closed using a conventional clip. **d** Finally, we completed the closure of the remnant gaps using only conventional clips.

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