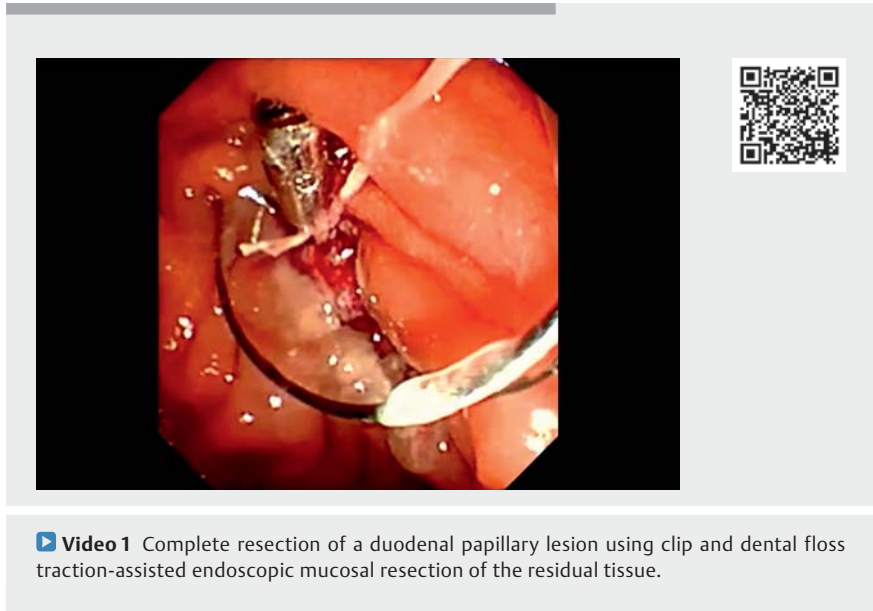


## Clip and dental floss traction-assisted endoscopic mucosal resection for early carcinoma of the duodenal papilla

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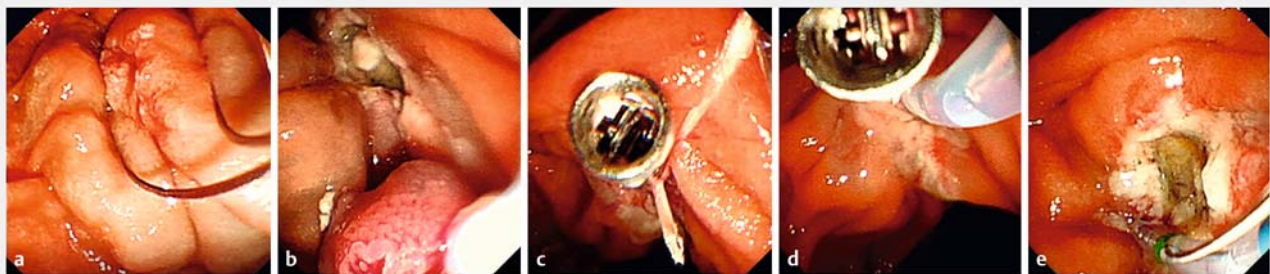
Endoscopic papillectomy was first reported in Japan in 1983 [1]. It is currently recognized as an alternative to surgical resection for ampullary neoplasms, and has a higher success rate and fewer adverse events compared with open surgery [2]. At present, there are many methods of endoscopic papillectomy, but there are differences in the complete resection rate, complications, operative difficulty, and other aspects between the various methods [3, 4]. There is still a lack of consensus on the optimal method. In particular, there is controversy about whether submucosal injection is necessary [4, 5]. We propose a compromise and relatively simple innovative method, which can improve the complete resection rate of residual tissue after submucosal injection, and provide a new idea for the endoscopic resection of difficult papillary lesions.

A 75-year-old woman who was asymptomatic was diagnosed with a duodenal papillary tubular adenoma, with focal mucosal high grade intraepithelial neoplasia on physical examination. It was planned for her to undergo endoscopic therapy. After she had given informed consent, the patient was managed under general anesthesia. The procedure was successfully carried out as follows



(▶ **Video 1**). First, a mixture of methylene blue and normal saline was injected into the submucosa around the papilla with a needle, and the lesion lifted well. A snare device was then inserted via the endoscope biopsy port and adjusted to grasp the lesion, which was excised using electrocautery (▶ **Fig. 1 a**). There was however still residual tissue in the center of the wound (▶ **Fig. 1 b**). Therefore, a clip combined with dental floss was used for

traction-assisted lifting and exposure of the residual tissue (▶ **Fig. 1 c**), and the same snare was used again to successfully remove the residual tissue (▶ **Fig. 1 d, e**). Although clip and dental floss traction-assisted endoscopic mucosal resection may be the preferable method for resection of early carcinoma of the duodenal papilla, further studies with more cases will be needed to validate the advantages of this technique.



▶ **Fig. 1** Endoscopic views of clip and dental floss traction-assisted endoscopic mucosal resection being performed showing: **a** a snare device adjusting the angle to capture the duodenal papillary lesion following submucosal injection; **b** residual tissue in the center of the wound after the lesion had been excised using snare electrocautery; **c** clip combined with dental floss traction to provide auxiliary exposure of the residual tissue; **d** the snare being used again to remove the residual tissue under improved visualization with auxiliary traction; **e** the clean wound after the second resection, with the opening of the bile and pancreatic ducts clearly seen.

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## Competing interests

The authors declare that they have no conflict of interest.

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