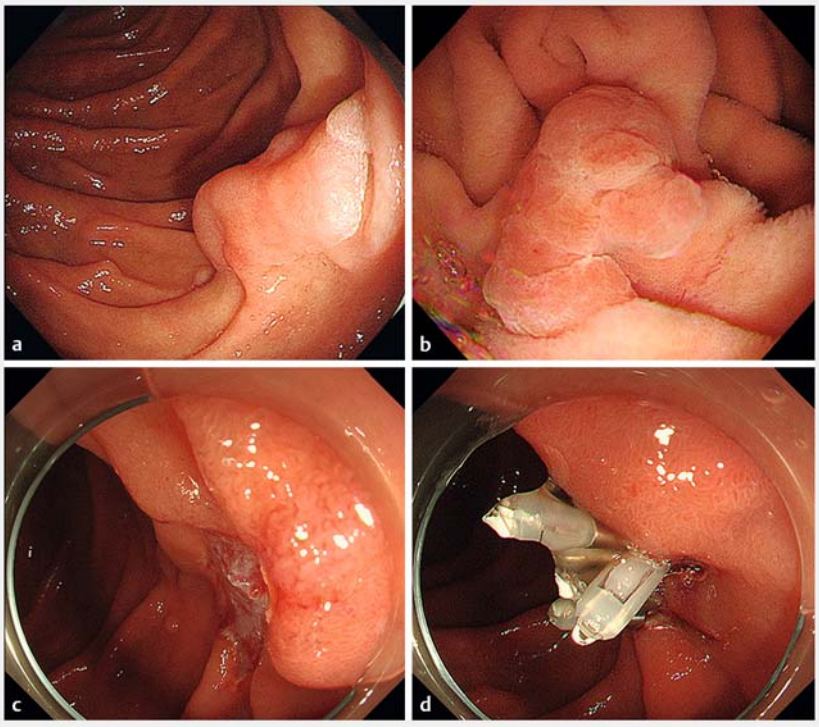
# Underwater endoscopic mucosal resection of residual duodenal tumor

A 51-year-old man underwent screening esophagogastroduodenoscopy (EGD) and was found to have a 15-mm duodenal adenoma opposite the ampulla of Vater. Endoscopic submucosal dissection (ESD) was attempted but was discontinued because of a perforation that was managed by clip closure. He was followed up periodically by EGD and a biopsy taken 2 years later revealed a possible adenocarcinoma. He was therefore referred to our hospital.

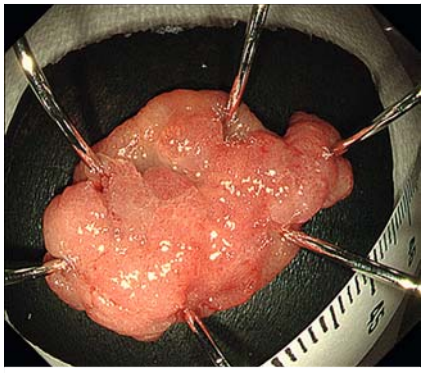
EGD revealed a superficial 20-mm elevated lesion (▶ **Fig. 1 a**). Conventional endoscopic mucosal resection (EMR) of the residual tumor with submucosal saline injection would have been difficult because of submucosal fibrosis. Furthermore, ESD for duodenal tumors carries a high risk of perforation [1], and performing ESD on residual lesions demands highly advanced skills. Underwater EMR (UEMR) was developed and described by Binmoeller et al. in 2012 [2]. We previously reported the usefulness of this technique for superficial non-ampullary duodenal adenomas [3]. As for colonic recurrent or residual lesions, UEMR is reportedly effective with a higher en bloc resection rate and lower recurrence rate than conventional EMR [4]. We therefore performed UEMR on this residual duodenal lesion.

We used a pediatric colonoscope (EVIS PCF-H290TI; Olympus Medical Systems, Tokyo, Japan) because it is preferable for duodenal lesions owing to its long length and wide down-angle. We evacuated air from the affected segment of lumen and infused water until the lumen was completely full (▶ **Fig. 1 b**), after which we performed hot snare polypectomy without submucosal injection using a Captivator (Boston Scientific, Tokyo, Japan). We resected the lesion en bloc in 4 minutes and completely closed the mucosal defect with clips (▶ **Fig. 1 c, d**; ▶ **Video 1**).




▶ **Fig. 1** Endoscopic images showing: **a** a tumor in the duodenum opposite the ampulla of Vater; **b** the polyp underwater; **c** the mucosal defect after underwater endoscopic mucosal resection had been performed, with a vessel visible in the defect; **d** complete closure of the defect using clips.

**Video 1** Underwater endoscopic mucosal resection of residual duodenal tumor.



▶ **Fig. 2** Photograph of the resected en bloc specimen.

The patient commenced oral feeding on day 2 postoperatively and was discharged on day 5. Pathologically, the lesion was an intramucosal adenocarcinoma (▶ **Fig. 2**). Neither endoscopic nor histologic residue was observed at the follow-up EGD 2 months later.

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## Competing interests

None

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**Bibliography**
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