Hybrid resection with endoscopic submucosal dissection and full-thickness resection device of a large cecal laterally spreading tumor involving the appendix

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Endoscopic submucosal dissection (ESD) allows for en bloc resection of large superficial neoplasms of the GI tract. However, ESD of lesions involving the appendix has a high risk of adverse events, even for experts.[1-3] Endoscopic full-thickness resection (EFTR) using a full-thickness resection device (FTRD; Ovesco Endoscopy, Tübingen, Germany) is a new approach for these lesions, but the main limitation is tumor size.[4-6] A recent case series described the hybrid ESD-EFTR technique as a rescue approach for "difficult" ESD (Fig. 1).[7] We present the case of a large cecal laterally spreading tumor invading the appendix and resected with the

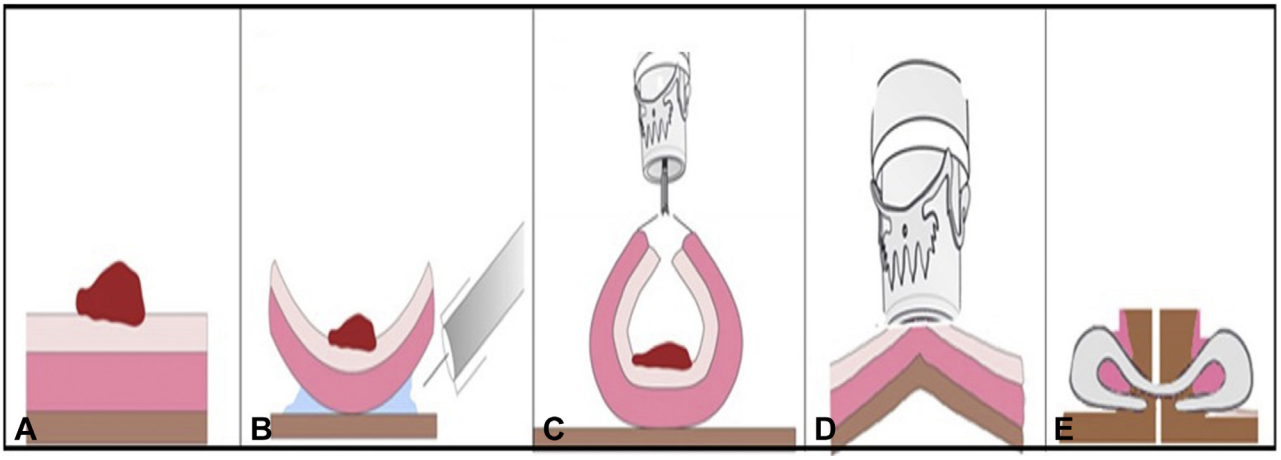

Figure 1. Schematic illustration of the hybrid endoscopic submucosal dissection–endoscopic full-thickness resection technique. **A,** Lesion. **B,** Endoscopic submucosal dissection of the lesion to the fibrosis area. **C,** Grasping the margins of the lesion with a full-thickness resection device grasper. **D,** Pulling the lesion into the cap of the full-thickness resection device. **E,** Resection site.

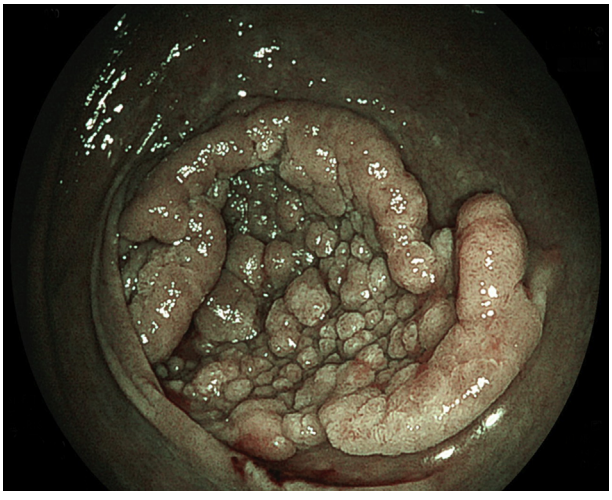

Figure 2. Large laterally spreading tumor invading the appendix was assessed with blue laser imaging.

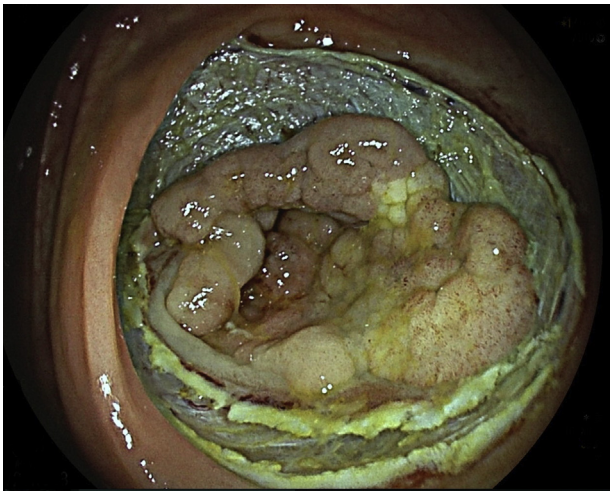

Figure 3. Endoscopic submucosal dissection was performed with HybridKnife T-Type.

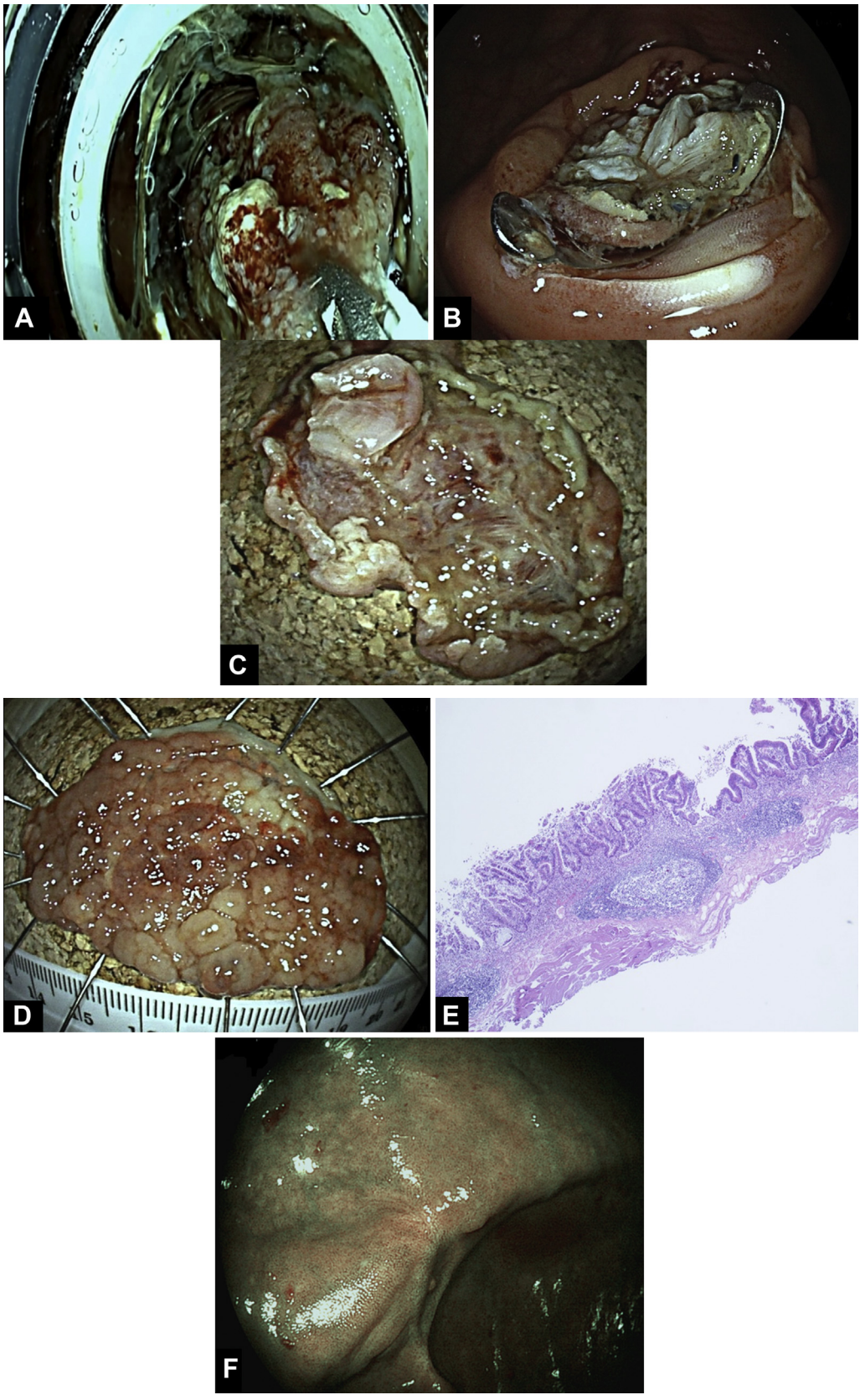

Figure 4. A, The target lesion is grasped and pulled into the cap by using the grasping forceps. **B,** Resection site. **C, D,** The specimen after placement on a cork board. **E,** Microscopic histopathology images of resection specimens after resection. **F,** Hybrid resection scar with endoscopic submucosal dissection and full-thickness resection device.

hybrid technique Video 1, available online at www.VideoGIE.org; (Fig. 2).

The procedure was performed with the patient under deep sedation (midazolam bolus and continuous propofol infusion). The patient received prophylactic antibiotic therapy (intravenous ciprofloxacin and metronidazole). ESD of the cecum was performed with use of a slim colonscope (EC-740TM/TL, distal end diameter: 9.8 mm, working channel diameter: 3.2 mm, length: 1,690 mm; Fujifilm, Tokyo, Japan), CO_2 insufflation, and HybridKnife T-Type (Erbe Elektromedizin, Tübingen, Germany) for waterjet dissection (Fig. 3). FTRD mounted on a standard colonoscope (EC 760 R; Fujifilm) was used to complete the en bloc resection and to facilitate the introduction of the device. A guidewire stiff was left in the cecum (Jagwire Guidewire ST Stiff; Boston Scientific, Marlborough, Mass, USA). The lesion was pulled into the cap by using the FTRD grasper (Ovesco Endoscopy) until the muscular layer was visible inside, and EFTR was performed (Fig. 4). The procedure time was 150 minutes. Specimen size was 52 × 30 mm. Histology results confirmed full-thickness resection and showed tubulovillous adenoma with high-grade dysplasia (Fig. 4). Starting 24 hours after the procedure, the patient followed a semiliquid diet and antibiotic therapy for 3 days. He was discharged 48 hours after the procedure, and no adverse events occurred. Endoscopic follow-up at 6 months showed spontaneous over-the-scope clip dislocation, and the scar histology testing was negative for neoplasia. This new technique could exceed the limit of the FTRD, the only device that allows EFTR of appendicular lesions. Prospective studies are needed to evaluate the efficacy and safety of this new technique.

TIPS FOR HYBRID RESECTION WITH ESD AND FTRD

1. ESD of cecal lesions involving the appendiceal orifice is technically more challenging; therefore, specific training and a high level of skill are required to safely perform the procedure.
2. Before starting resection, we strongly recommend using the prove-CAP (Ovesco Endoscopy), with a cap similar in size to the FTRD cap, to evaluate the accessibility of the lesion.
3. A "test colonoscopy" allows the clinician to optimize bowel preparation, which remains an important prerequisite for the resection.
4. To facilitate the introduction of the FTRD, we recommend releasing a guidewire stiff in the cecum.
5. Preoperative antibiotic prophylaxis decreases the risk of appendicitis.
6. Use the FTRD gasper to grasp the dissected lesion flap in at least two sections to visualize the muscle layer and ensure the entire lesion inside the cap is tractioned. In some cases, it is useful to add gentle aspiration to the traction movement of the forceps.
7. We recommend this technique only after providing thorough patient information and after interdisciplinary discussion.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviations: ESD, endoscopic submucosal dissection; EFTR, endoscopic full-thickness resection; FTRD, full-thickness resection device.

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