Appendix e1 Description of the ESD procedure

Bowel preparation was performed using a single dose of sodium picosulfate solution (Laxoberon; Teijin Pharma Co. Ltd., Tokyo, Japan) on the night before the ESD procedure, and 3 L of isotonic polyethylene glycol electrolyte solution (Niflec; Ajinomoto Pharma Co. Ltd., Tokyo, Japan) on the morning of the ESD procedure.

Intravenous mitorazepam was used as initial and maintenance sedation, and the patients’ cardiorespiratory function was monitored. A single endoscope with a transparent tip hood (Top, Tokyo, Japan) attached was used with carbon dioxide insufflation. The transparent hood was used to facilitate the application of traction on the mucosa to create space for submucosal dissection. The hood protruded about 6 mm from the tip of the endoscope. We used a PCF-Q260JI (Olympus, Tokyo, Japan) for lesions in the sigmoid colon or rectum, and a PCF-Q260AZI (Olympus) for lesions from the descending colon to the cecum.

First, 0.4% sodium hyaluronate (Muco Up; Johnson & Johnson, New Brunswick, New Jersey, USA) with a small amount of indigo carmine and epinephrine was injected into the submucosal layer, using a 21-gauge injection needle. A circumferential incision was initiated from the anal side with the SB Knife Jr. (Fig. 1). The knife has an opening width of 4.5 mm and length of 3.5 mm. The circumferential incision was extended and was followed by submucosal dissection in a repeating manner until the entire lesion had been resected.

The SB Knife Jr. was also used for endoscopic hemostasis in bleeding situations. If repeated coagulation was required, hemostatic forceps (Coagrasper; Olympus) were used. The dissected segment was grasped and current was passed using a high-frequency generator (VIO300D; ERBE, Tübingen, Germany; or ESG 100; Olympus). The VIO300D was used at the following settings: endo-cut Q mode (effect 1, duration 1, interval 1) for mucosal incision and submucosal dissection, and a soft coagulation mode (effect 5, 40 W) for hemostasis. The ESG 100 was used at the following settings: Pulse Cut First mode (30 W) for mucosal incision and submucosal dissection, and a soft coagulation mode (40 W) for hemostasis. See Video 1 for more details.