Partially insulated cutting instruments for hybrid endoscopic submucosal dissection – the Flat Adenoma Resection Instruments (FARIn)

The endoscopic resection of colorectal polyps that are limited to the mucosa is a well established procedure. Nevertheless, modern imaging technology and screening programs have increased the detection of benign but large (>20 mm) polyps. In flat laterally spreading tumors (LST), especially the nongranular (NG) type, the rate of submucosal invasion is found to be as high as 39% (34%–44%) [1]. For this reason a resection in one piece is mandatory [2].

We report on the resection of a 25-mm flat rectal LST-NG in a 60-year-old patient who was admitted to the Klinikum Augsburg after screening colonoscopy (Fig. 1). Examination with a high definition colonoscope (CF-HQ 190i; Olympus Medical Systems, Tokyo, Japan) demonstrated a Sano Type II, pit pattern IIIa lesion. We decided to use two newly developed devices, the Flat Adenoma Resection Instruments (Endox-Feinmechanik GmbH, Bad Urach, Germany). Submucosal injection was performed using a mixture of saline, epinephrine (1:100,000), glycerol

Fig. 1 Rectal laterally spreading tumor – nongranular type. a The tumor during screening colonoscopy. b Narrow-band imaging with a high definition colonoscope demonstrated a Sano Type II lesion. c After spray application of indigo carmine solution, a surface pit pattern IIa was diagnosed.

Fig. 2 Resection of the rectal tumor using the Flat Adenoma Resection Instruments (FARIn; Endox-Feinmechanik GmbH, Bad Urach, Germany). a, d Hybrid endoscopic submucosal dissection using the FARIn Type I: 1 = catheter sheath; 2 = the rhomboid-shaped and electrically isolated section; 3 = the 1-mm tooth at the distal end, used for circular incision (a); b, e The specimen could be resected using the partially insulated snare (FARIn Type C): 1 = catheter sheath; 2, 3 = electrically isolated section of the device; 4 = the 15-mm cutting wire at the distal tip of the snare; 5 = the tip of the snare is isolated in order to protect the organ wall from injury; 7, 8 = The colored markings on the snare allow the cutting speed to be visualized when the snare is closed. c Resected specimen mounted onto cork, showing the adenoma in the center of the mucosa.
(10%), and a small amount of indigo carmine solution. Circumferential incision was performed using the FARIn Type I, a rhomboid-shaped device with a small 1-mm cutting tooth at the distal tip. A high frequency generator (VIO 300 D; Erbe, Tübingen, Germany) was configured to AUTO CUT 300 W and FORCED COAG 30 W. After circumferential incision, the specimen could be resected en bloc using the FARIn Type C, a symmetric snare with a cutting wire length of 15 mm (Fig. 2, Video 1).

The histopathological examination showed an adenoma with high grade dysplasia in the center of the lesion and an adherent submucosal layer of >1000 µm in depth (DST). Complete (R0) circumferential resection of the lesion was achieved (hematoxylin and eosin × 20).

**Competing interests:** Dr. Farin is the inventor of the FARIn devices.

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**References**