

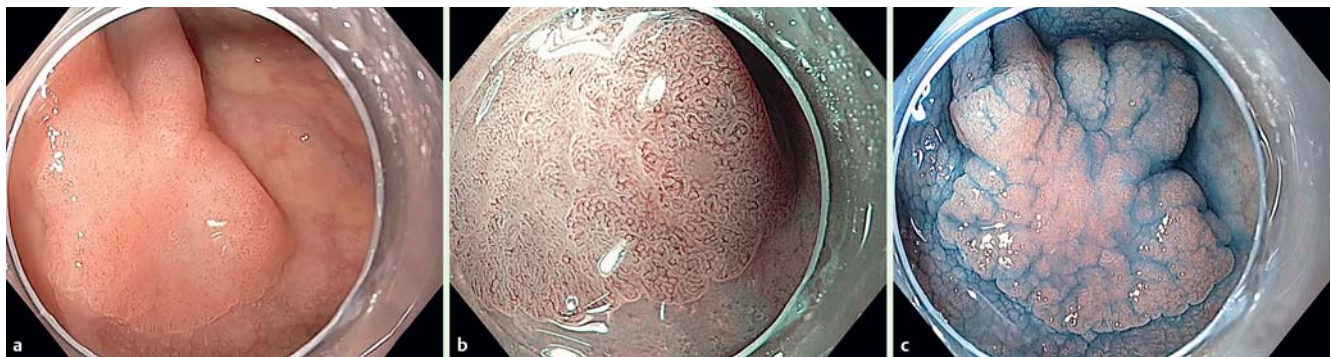
## Partially insulated cutting instruments for hybrid endoscopic submucosal dissection – the Flat Adenoma Resection Instruments (FARIn)

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.

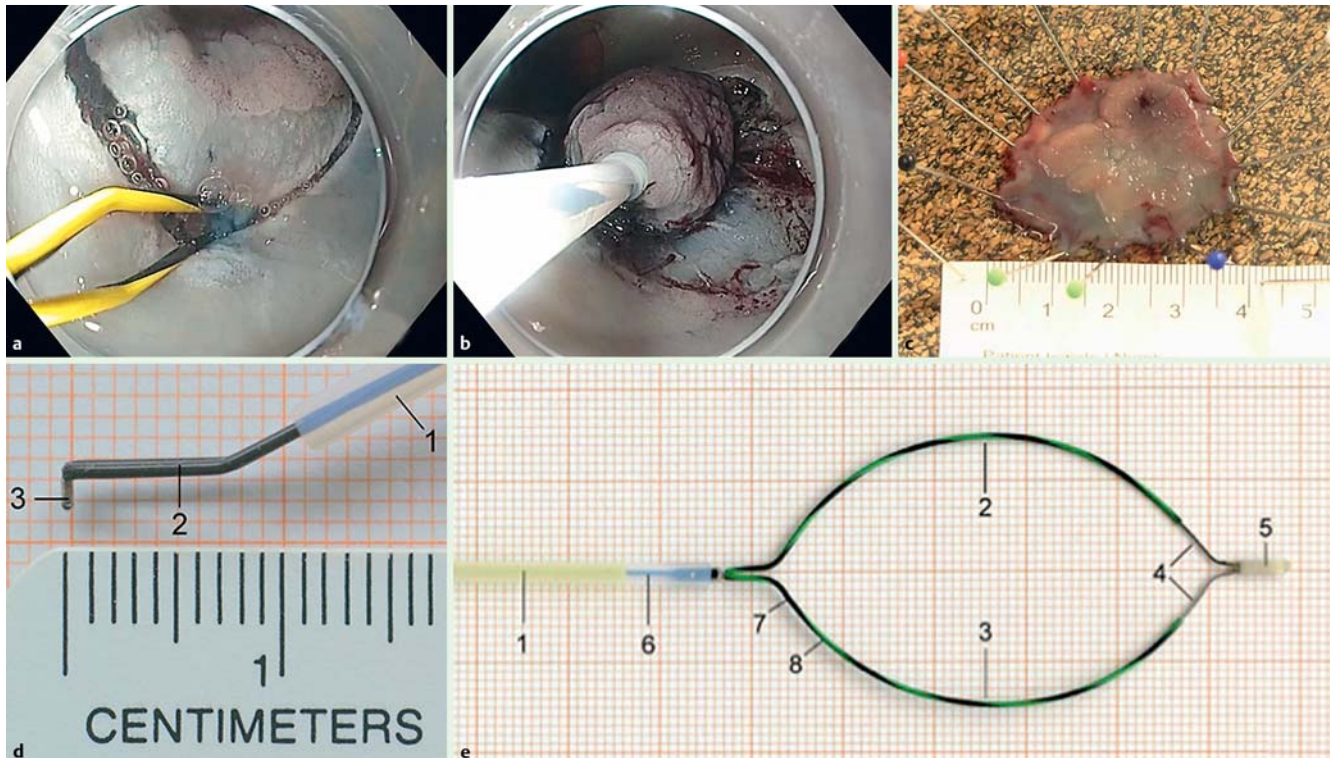
In flat laterally spreading tumors (LST), especially the nongranular (NG) type, the rate of submucosal invasion is found to be as high as 39% (34%–44%) [1]. For this reason a resection in one piece is mandatory [2].

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 IIIs 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 IIIs was diagnosed.

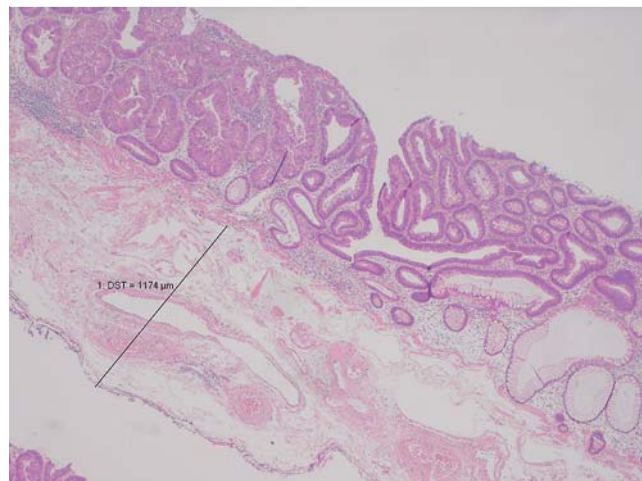


**Fig. 2** Resection of the rectal tumor using the Flat Adenoma Resection Instruments (FARIn; Endox-Feinmechanik GmbH, Bad Urach, Germany). **a, d** Hybrid endoscopic submucosal dissection using the FARIn Type I: 1 = catheter sheath; 2 = the rhomboid-shaped and electrically isolated section; 3 = the 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.

## Video 1



Partially insulated instruments for hybrid endoscopic submucosal dissection of a rectal laterally spreading tumor–nongranular type.



**Fig. 3** The histopathological examination showed an adenoma with high grade dysplasia in the center of the lesion and an adherent submucosal layer of  $>1000\mu\text{m}$  in depth (DST). Complete (R0) circumferential resection of the lesion was achieved (hematoxylin and eosin  $\times 20$ ).

(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 300W and FORCED COAG 30W. 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, and an adherent submucosal layer to a depth of  $>1000\mu\text{m}$  under the entire lesion (• Fig. 3).

In summary, the FARIn instruments allowed the en bloc resection of a large ( $>20\text{mm}$ ) LST-NG with adherent submucosal layer ( $>1000\mu\text{m}$ ), which meets the specimen requirements for pathological complete resection (R0).

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

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- 2 Pimentel-Nunes P, Dinis-Ribeiro M, Ponchon T et al. Endoscopic submucosal dissection: European Society of Gastrointestinal Endoscopy (ESGE) guideline. *Endoscopy* 2015; 47: 829–854

### Bibliography

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