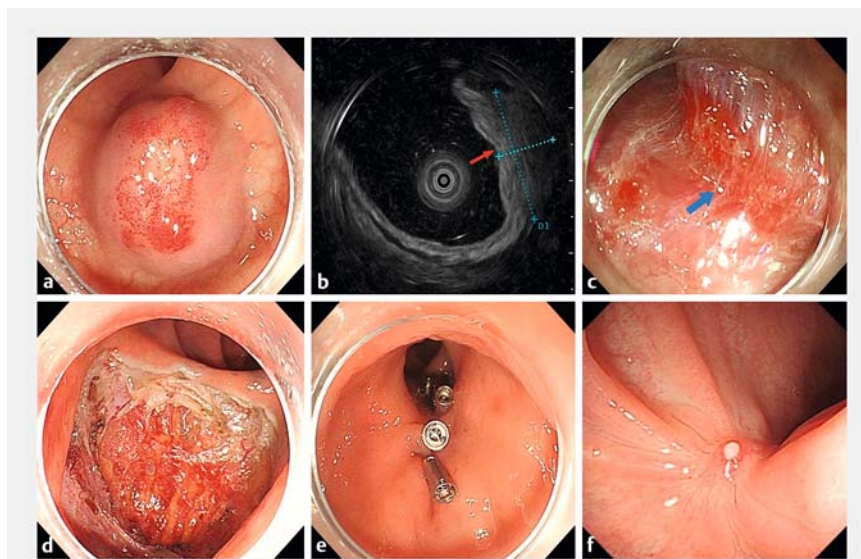


Successful resection of a cavernous hemangioma involving the rectal muscularis propria layer by endoscopic full-thickness resection

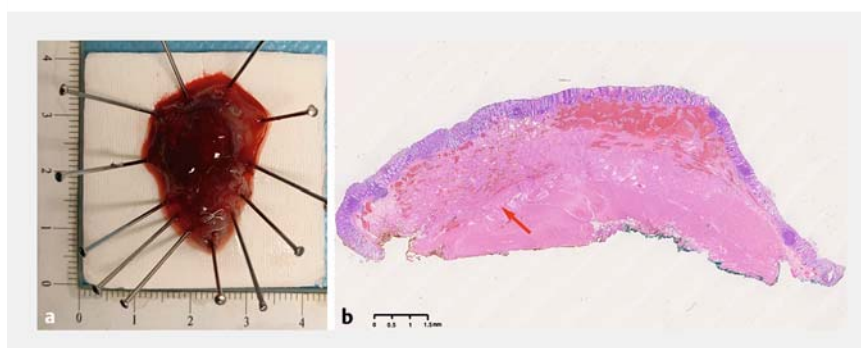
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A 46-year-old woman with a history of hematochezia visited our institution for colonoscopy. A globular submucosal tumor with a diameter of approximately 20 mm and mucosal hyperemia was detected in the rectum (► **Fig. 1 a**). Further endoscopic ultrasonography showed a well-defined, homogeneous, hyperechoic mass 18 mm × 9 mm in size originating from the submucosal layer (► **Fig. 1 b**), suggesting that the mass might be a hemangioma. At this point, endoscopic submucosal dissection (ESD) was considered for the treatment of the lesion. First, after submucosal injection we made a circumferential mucosal incision using a dual knife (Olympus, Tokyo, Japan). However, during the procedure we found that the boundary between the lesion and the muscularis propria layer was not clear (► **Fig. 1 c**). Therefore, ESD was not the right choice to ensure en bloc resection of the lesion, and endoscopic full-thickness resection (EFTR) was believed to be a better option for this patient (► **Fig. 1 d**, ► **Fig. 2 a**, ► **Video 1**). After partial dissection of the lesion, we used a snare to complete EFTR of the lesion, and finally the defect was successfully closed using titanium clips and a nylon cord (Micro-Tech, Nanjing, China) (► **Fig. 1 e**). Histopathology revealed a cavernous hemangioma with involvement of the muscularis propria layer (► **Fig. 2 b**). The patient was discharged 3 days after treatment without any complications. A follow-up colonoscopy was performed 3 months later and indicated that the defect was basically healed (► **Fig. 1 f**).

Although endoscopic mucosal resection and ESD have been reported for treatment of colorectal cavernous hemangioma [1, 2], this is the first report of a cavernous hemangioma resected by EFTR. Since hemangiomas sometimes infiltrate into the muscle layer or completely over the layer [3], compared with endoscopic mucosal resection and ESD, the major advantage of EFTR is that it carries less



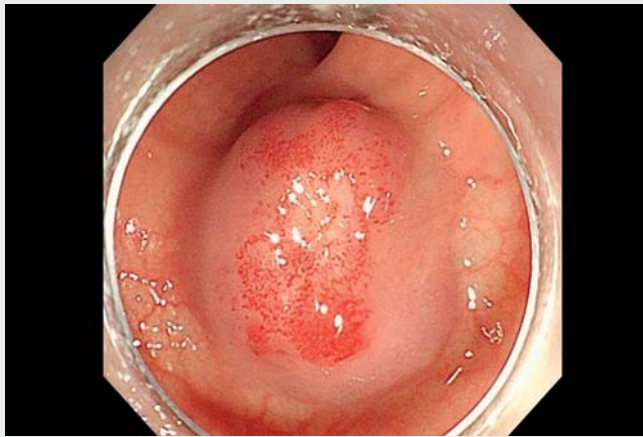
► **Fig. 1** Successful en bloc resection of rectal cavernous hemangioma by endoscopic full-thickness resection. **a** Colonoscopy revealed a submucosal tumor approximately 20 mm in diameter in the rectum. **b** Endoscopic ultrasonography showed a well-defined, homogeneous, hyperechoic mass 18 mm × 9 mm in size growing from the submucosal layer (red arrow). **c** During treatment it became evident that the lesion had involved the muscularis propria layer (blue arrow). **d** The lesion was successfully resected by endoscopic full-thickness resection. **e** The postoperative defect was closed. **f** Follow-up colonoscopy 3 months later showed that the defect was basically healed.



► **Fig. 2** Postoperative specimen and histopathological result. **a** The specimen measured 30 mm × 20 mm. **b** Histopathology revealed a cavernous hemangioma involving the muscularis propria layer (red arrow).

risk of residual or recurrent hemangioma, and it is suggested that perhaps EFTR is a better treatment option for colorectal cavernous hemangiomas involving the muscularis propria layer.

Endoscopy_UCTN_Code_TTT_1AQ_2AD



Video 1 Successful resection of a cavernous hemangioma involving the rectal muscularis propria layer by endoscopic full-thickness resection.

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Competing interests

The authors declare that they have no conflict of interest.

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