

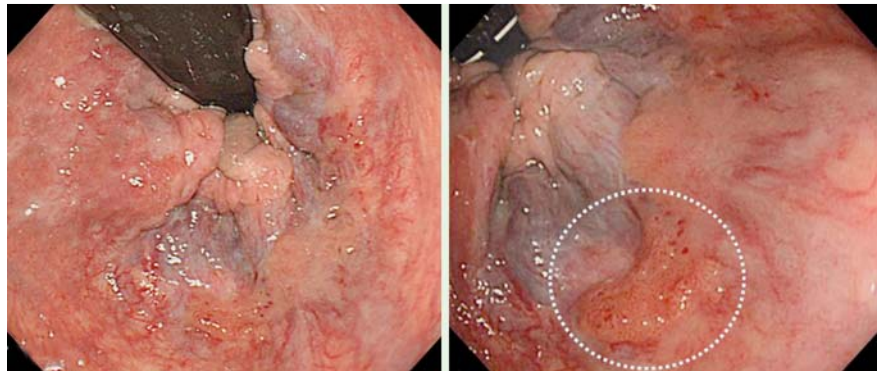
## Novel diagnostic methods for early-stage squamous cell carcinoma of the anal canal successfully resected by endoscopic submucosal dissection

Although anal canal squamous cell carcinoma (ACSCC) is quite rare, it can be recognized clearly using iodine staining [1]. Early-stage esophageal squamous cell carcinoma (SCC) has recently been diagnosed using both narrow-band imaging (NBI) [2] and autofluorescence imaging (AFI) [3]. Here we report on the first case of early-stage ACSCC diagnosed by NBI and AFI and treated successfully by endoscopic submucosal dissection (ESD).

A 70-year-old woman was referred to our hospital for treatment of ACSCC. Conventional colonoscopy (PCF-Q240Z, Olympus Optical Co., Tokyo, Japan) revealed a slightly protruded lesion approximately 10 mm in size and located close to the dentate line (● Fig. 1). The superficial microvessels of the lesion were examined by white light and NBI systems with magnification (● Fig. 2), and appeared similar to esophageal intraepithelial papillary capillary loops (IPCLs) [4]. The AFI image was purple in color (● Fig. 3 d), and the lesion was unstained following iodine staining. NBI, AFI, and iodine staining images were similar to those of esophageal SCC (● Fig. 3) [3, 4].

An endoscopic diagnosis of carcinoma in situ was made because of the IPCL-like microvessels; ESD was performed (● Fig. 4) [5] because the location of the lesion caused technical difficulties in achieving an en-bloc endoscopic mucosal resection. Histopathological analysis of the resected specimen revealed SCC, with microinvasion of 0.4 mm but no lymphovascular invasion (● Fig. 5). Chemoradiation therapy, with a dose-reduction of 25%, was carried out because of the microinvasion. A follow-up colonoscopy performed 23 months later revealed the ESD scar (● Fig. 6), and the biopsy specimen was negative for malignancy.

Endoscopic diagnosis of ACSCC and an accurate prediction of invasion were both based on similarity to esophageal IPCLs. En-bloc ESD of early-stage ACSCC followed by chemoradiation therapy resulted in a successful treatment and better



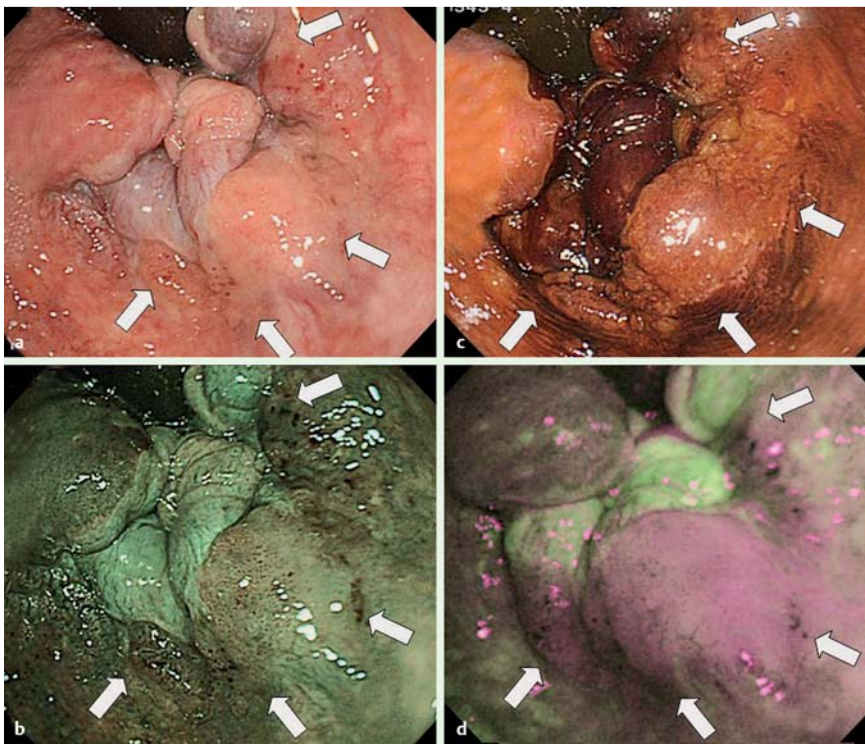
**Fig. 1** Conventional colonoscopy showed a slightly protruded lesion (white circle) measuring approximately 10 mm in the lower rectum close to the dentate line.



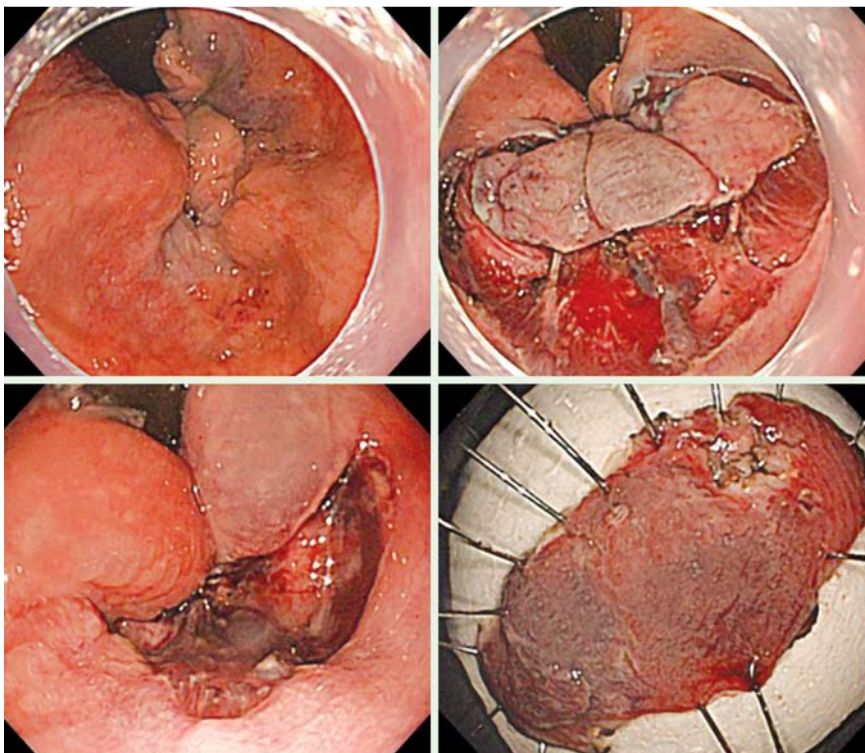
**Fig. 2** a, b Magnified conventional white light views of the mildly protruded lesion showed dilatation, weaving, and elongation of intraepithelial papillary capillary loops (IPCL)-like microvessels. c, d Magnified narrow-band imaging colonoscopic views clearly showed dilatation, weaving, and elongation of IPCL-like microvessels.

patient quality of life; it is possible, therefore, that this could become a standard treatment protocol in the future for early-stage ACSCC.

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**Fig. 3** Different views of the lesion. **a** Conventional white light. **b** Narrow-band imaging. **c** Chromoendoscopy (iodine-staining). **d** Autofluorescence imaging.



**Fig. 4** Pictures of the endoscopic submucosal dissection procedure.

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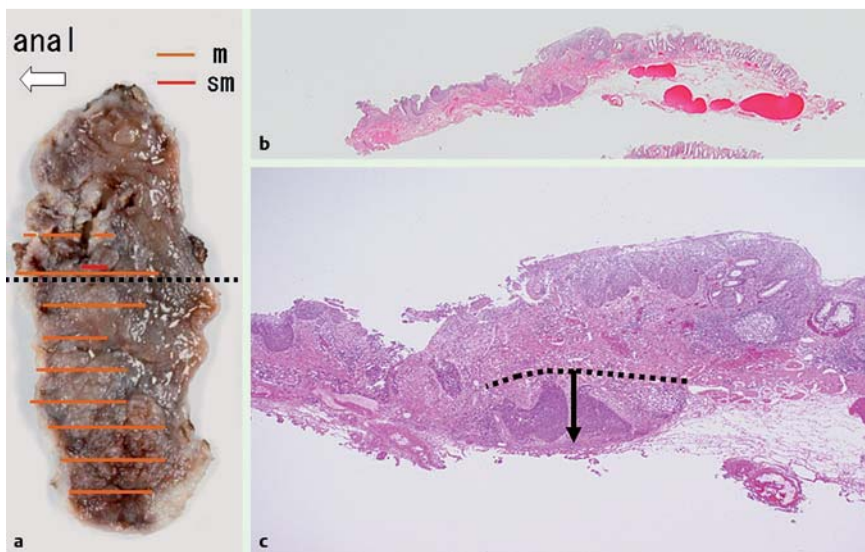
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**Fig. 5** a Resected specimen (10 × 40 mm). Orange lines indicate mucosal (m) cancer areas. The red line indicates the submucosal (sm) invasion area. b Hematoxylin and eosin staining. c Original magnification of black square shown in b (× 80). The submucosal invasion was 0.4 mm, estimated by the putative line extending from the muscularis mucosa of the colorectal mucosa.

#### Bibliography

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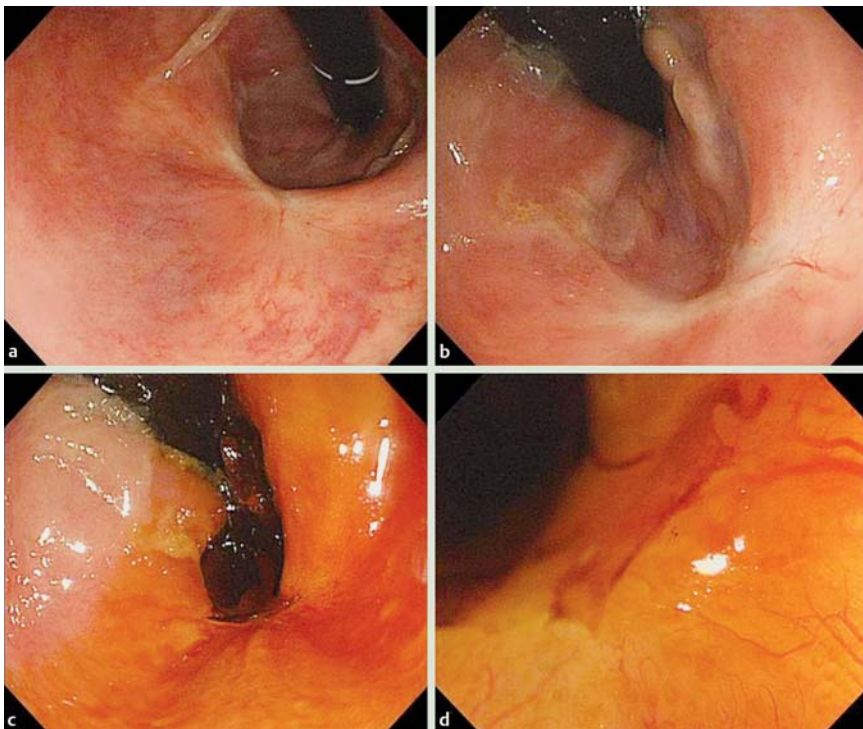
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**Fig. 6** The follow-up pictures of colonoscopy after endoscopic submucosal dissection and chemoradiation therapy. a Conventional colonoscopic view. b Close-up conventional colonoscopic view. c Iodine-stained chromoendoscopic view. The resection area is shown as iodine-stained. d Magnified chromoendoscopic view. The resection was iodine-stained, and there were no abnormal IPCL-like microvessels.