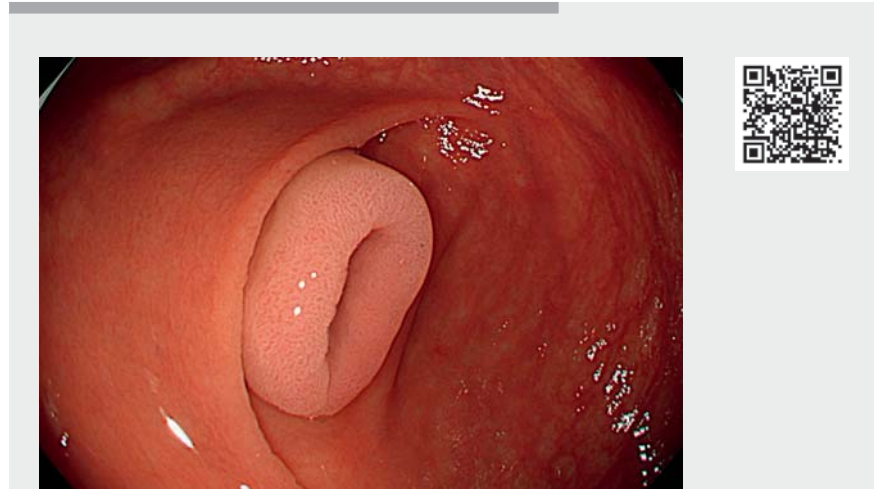


## Low-grade appendiceal mucinous neoplasms observed by magnifying endoscopy

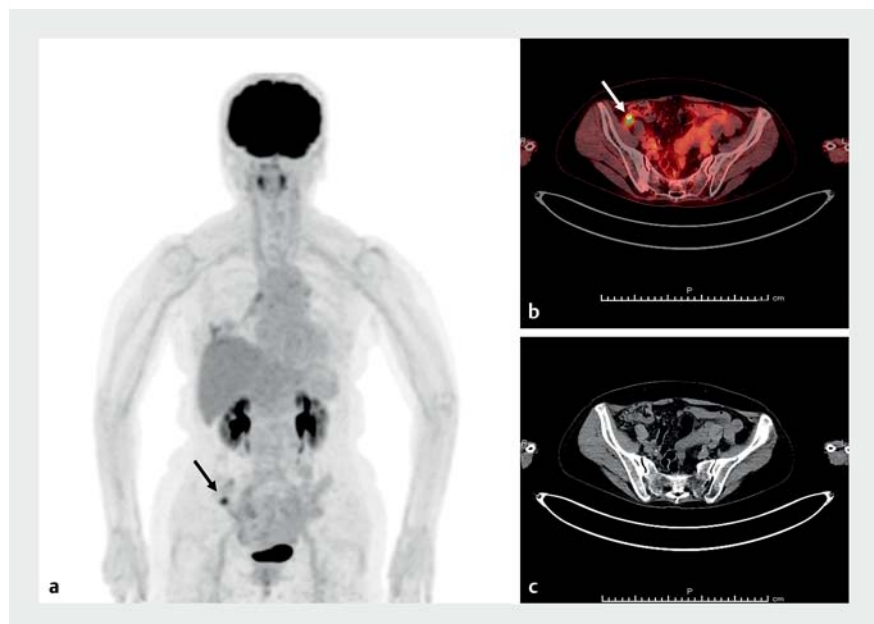
Appendiceal mucinous neoplasms are the second most common tumors after carcinoid tumors in all excised appendices [1]. Low-grade appendiceal mucinous neoplasms are often found incidentally (~50%), first discovered on radiography, endoscopy, or during surgery [2]. On endoscopy, they often appear as submucosal tumor-like elevations at the appendicular orifice [3]; there are no reports of associated epithelial changes. Herein we report two cases of endoscopically observed epithelial changes in low-grade appendiceal mucinous neoplasms (▶ **Video 1**).

Case 1: A 72-year-old woman underwent colonoscopy for contrast accumulation in the appendix on  $^{18}\text{F}$ -fluorodeoxyglucose positron emission tomography-computed tomography (▶ **Fig. 1 a, b, c**). Colonoscopy revealed a slightly elevated whitish lesion covered with a mucus cap in the cecum at the appendiceal orifice (▶ **Fig. 2 a, b**). Magnifying narrow-band imaging (NBI) showed no vessel pattern and regular, wavy, elongated surface structures (▶ **Fig. 2 c**). Using chromoendoscopy with indigo carmine, the boundary of the lesion was clearly visualized (▶ **Fig. 2 d**). Magnifying red dichromatic imaging with indigo carmine clearly showed regular, wavy, elongated, branched surface structures (▶ **Fig. 2 e**). Magnifying chromoendoscopy using crystal violet showed a wavy, branched pit, although the staining was not as clear as with other methods, probably owing to adherent mucus (▶ **Fig. 2 f**). Histopathological examination following ileocecal resection revealed a low-grade appendiceal mucinous neoplasm (▶ **Fig. 3 a, b**).

Case 2: A 74-year-old man underwent colonoscopy for appendiceal enlargement on computed tomography that showed a similar lesion as described in case 1 (▶ **Fig. 4 a**). Magnifying NBI, chromoendoscopy with indigo carmine, and magnifying chromoendoscopy using crystal violet showed the same findings as in case 1 (▶ **Fig. 4 b, c, d**). Following



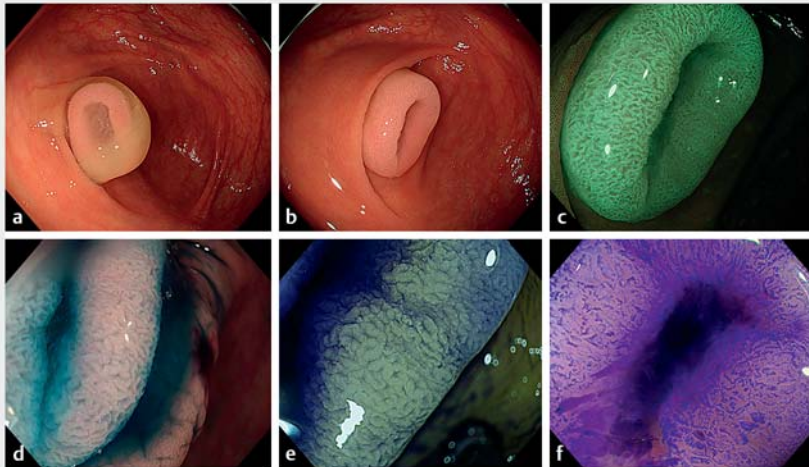
▶ **Video 1** Low-grade appendiceal mucinous neoplasms observed on magnifying endoscopy.



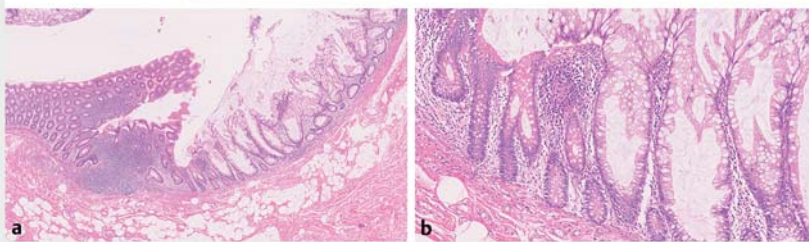
▶ **Fig. 1 a, b**  $^{18}\text{F}$ -fluorodeoxyglucose positron emission tomography-computed tomography showing accumulation of the radiotracer in the appendix (arrow). **c** Computed tomography showing no lesions.

ileocecal resection, histopathology revealed a low-grade appendiceal mucinous neoplasm (▶ **Fig. 5 a, b**) with some adenocarcinoma components in the tail of the appendix.

In these cases, low-grade appendiceal mucinous neoplasms were observed as whitish, slightly elevated lesions covered with a mucus cap, and no blood vessels could be identified. The findings were



► **Fig. 2** Endoscopic images showing a slightly elevated whitish lesion covered with a mucus cap in the cecum near the appendiceal orifice. **a, b** White light. **c** Magnifying narrow-band imaging. **d** Magnifying chromoendoscopy using indigo carmine. **e** Magnifying red dichromatic imaging with indigo carmine. **f** Magnifying chromoendoscopy using crystal violet staining.



► **Fig. 3** Histological examination (hematoxylin and eosin stained). **a** The distribution of lesions in the resection specimen is shown along with the boundary between normal mucosa and low-grade appendiceal mucinous neoplasm (the green line shows the area of low-grade appendiceal mucinous neoplasm with prominent mucous adhesion). **b** A magnified view of the area of low-grade appendiceal mucinous neoplasm; the mucinous epithelial cells are filiform with low-grade cytological atypia.

more similar to serrated lesions than adenomas.

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### Competing interests

The authors declare that they have no conflict of interest.

### The authors

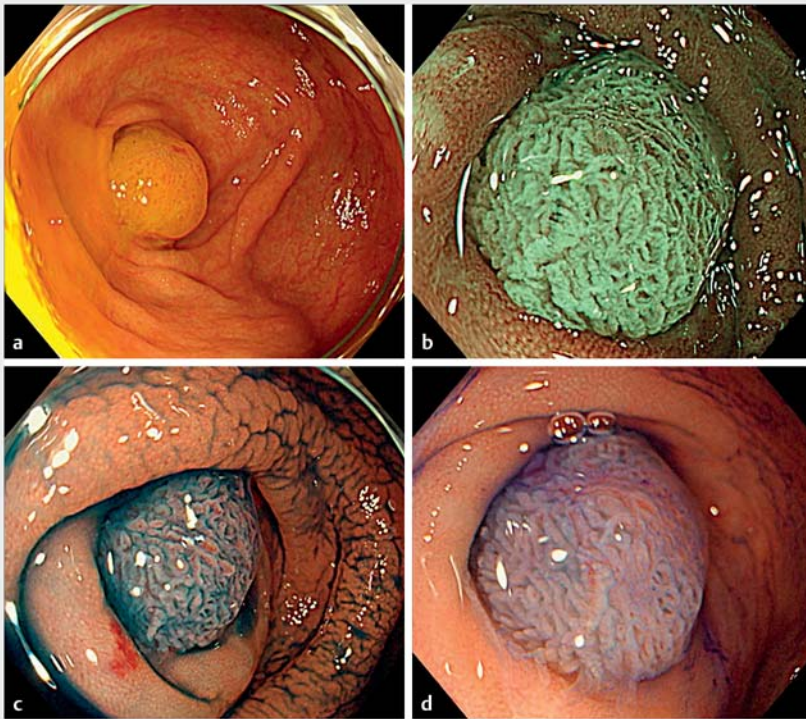
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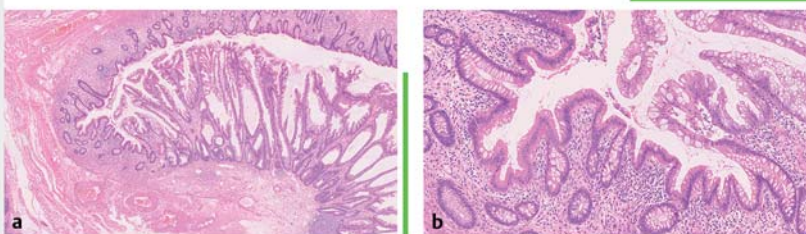
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► **Fig. 4** Endoscopic images showing a slightly elevated whitish lesion covered with a mucus cap in the cecum near the appendiceal orifice. **a** White light. **b** Magnifying narrow-band imaging. **c** Magnifying chromoendoscopy using indigo carmine. **d** Magnifying chromoendoscopy using crystal violet staining.



► **Fig. 5** Histological examination (hematoxylin and eosin stained). **a** The distribution of lesions in the resection specimen is shown along with the boundary between the normal mucosa and low-grade appendiceal mucinous neoplasm (the green line shows the area of low-grade appendiceal mucinous neoplasm). **b** A magnified view of the area of low-grade appendiceal mucinous neoplasm; the mucinous epithelial cells are villous with low-grade cytological atypia.

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## Bibliography

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