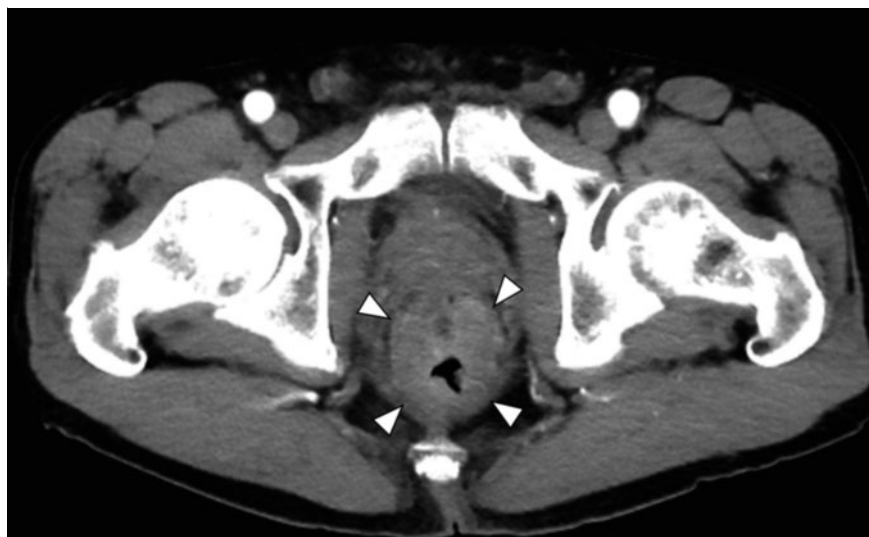


## Usefulness of detective flow imaging endoscopic ultrasound for the diagnosis of rectal wall thickening ▶

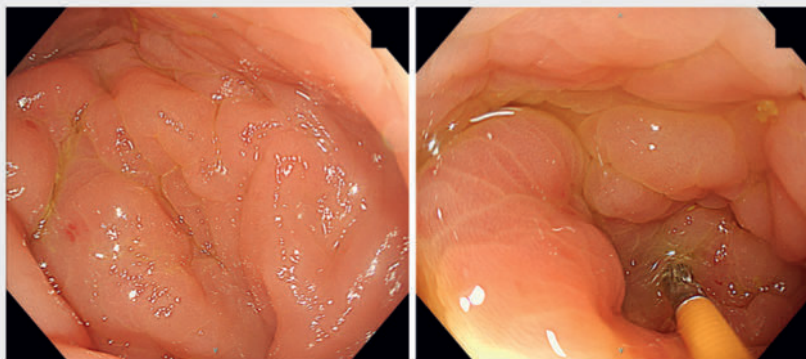


Rectal linitis plastica (RPL) is a rare rectal neoplasia manifestation characterized by diffuse wall thickening. A superficial endoscopic biopsy sometimes is inconclusive due to the tendency of RPL to cause extensive submucosal infiltration. Endoscopic ultrasound-guided tissue acquisition (EUS-TA) is currently an alternative diagnostic modality when endoscopic biopsy fails to verify the diagnosis [1, 2]. Recently, detective flow imaging (DFI) has been developed as a new ultrasound imaging technology [3]. It uses a unique algorithm that allows the visualization of fine vessels with low velocities in the absence of motion artifacts, which were previously difficult to visualize. We present the first case in which the DFI for EUS (DFI-EUS) was useful for RPL diagnosis.

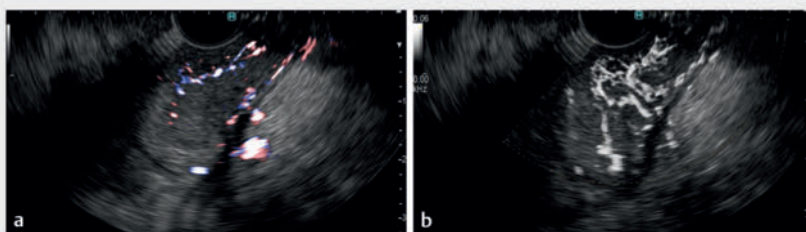
A 79-year-old male was referred to our hospital for elevated tumor marker investigation. He had a history of transurethral resection for bladder cancer without recurrence. He had elevated serum carcinoembryonic antigen and carbohydrate antigen 19-9 levels. Contrast-enhanced computed tomography revealed circumferential wall thickening of the rectum (▶ Fig. 1). Colonoscopy revealed an edematous rectal mucosa with reduced vascular transparency (▶ Fig. 2). The distensibility of the rectal wall by CO<sub>2</sub> insufflation was impaired. Multiple endoscopic biopsies were negative for tumor cells. Next, a curved linear echoendoscope was inserted. A rectal wall thickening was visualized by advancing the echoendoscope 5 cm from the anal verge. The lesion had homogenous low echogenicity with a maximum wall thickening of 17 mm. Color Doppler EUS revealed some blood flow inside the thickened wall (▶ Fig. 3a). Subsequently, DFI-EUS was performed, which demonstrated irregularly arborized microvasculature inside the thickened wall (▶ Fig. 3b, ▶ Video 1), suggesting malignancy [4, 5]. EUS-TA materials obtained from the lesion identified by DFI-EUS revealed



▶ Fig. 1 Circumferential wall thickening of the rectum (arrowheads) revealed by contrast-enhanced computed tomography.

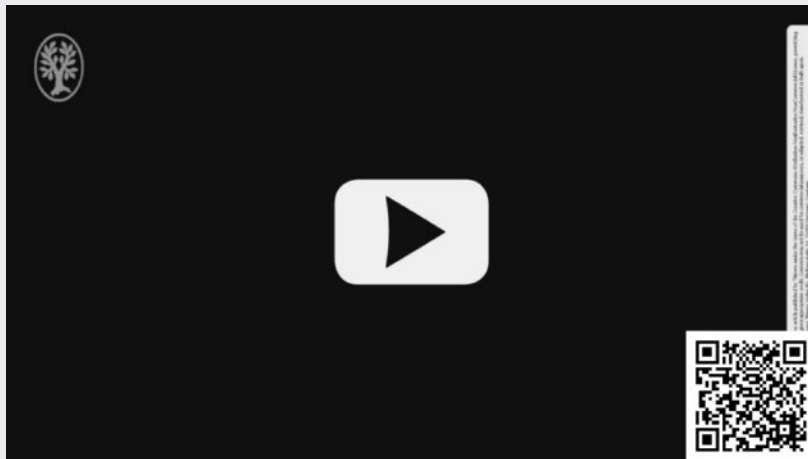


▶ Fig. 2 Edematous rectal mucosa with reduced vascular transparency revealed by colonoscopy.

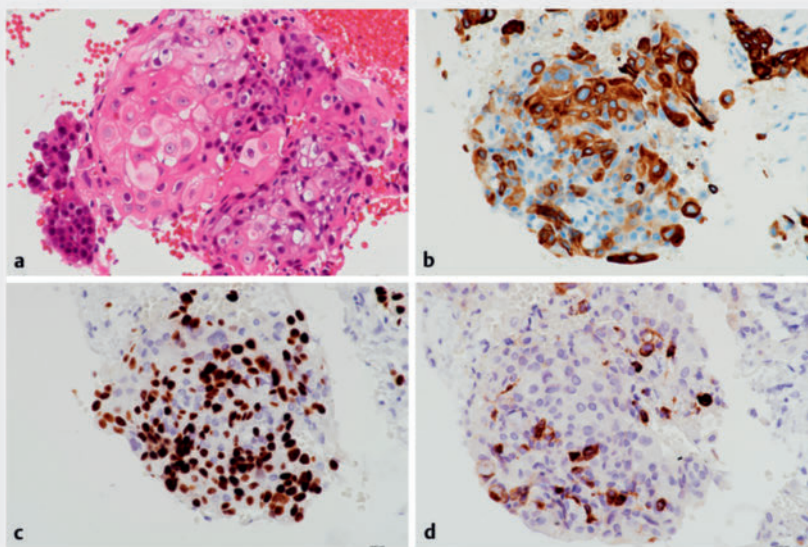


▶ Fig. 3 a Some blood flow inside the thickened rectal wall demonstrated by color Doppler endoscopic ultrasonography (EUS). b Irregularly arborized microvasculature inside the thickened wall of the rectum demonstrated by detective flow imaging EUS.

## VIDEO



▶ **Video 1** Detective flow imaging endoscopic ultrasonography for rectal wall thickening diagnosis.



▶ **Fig. 4** Histopathological examination of the thickened rectal wall obtained using endoscopic ultrasound-guided tissue acquisition showing **a** adenocarcinoma and squamous carcinoma (hematoxylin and eosin stain), **b** an immunohistochemical analysis showing tumor cells positive for CK5/6, **c** p40, and **d** CEA.

adenocarcinoma and squamous carcinoma (▶ **Fig. 4**), confirming the diagnosis of RLP. This case highlights the usefulness of DFI-EUS in evaluating intratumoral microcirculation and identifying the ideal puncture target.

## Conflict of Interest

The authors declare that they have no conflict of interest.

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