In vivo imaging of duodenal follicular lymphoma with confocal laser endomicroscopy

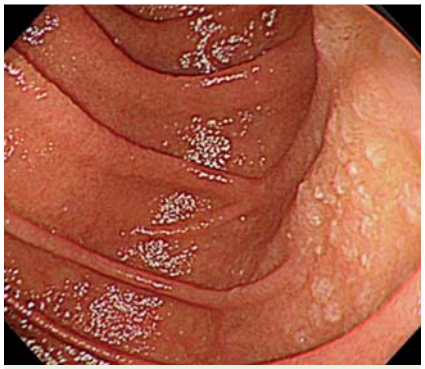

Fig. 1 Conventional endoscopic image. Multiple small whitish polyps were identified in the descending part of the duodenum in a 70-year-old woman.

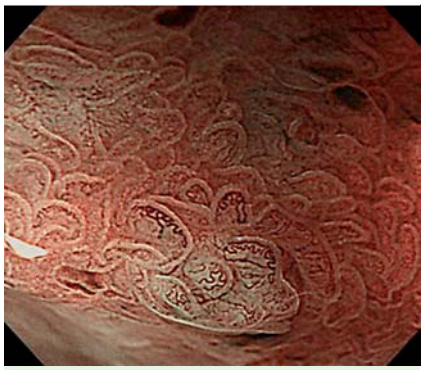

Fig. 2 Magnifying endoscopy combined with narrow-band imaging. The villi were fused and enlarged compared to the surrounding normal villi. Curled vascular loops were present in the enlarged villi.

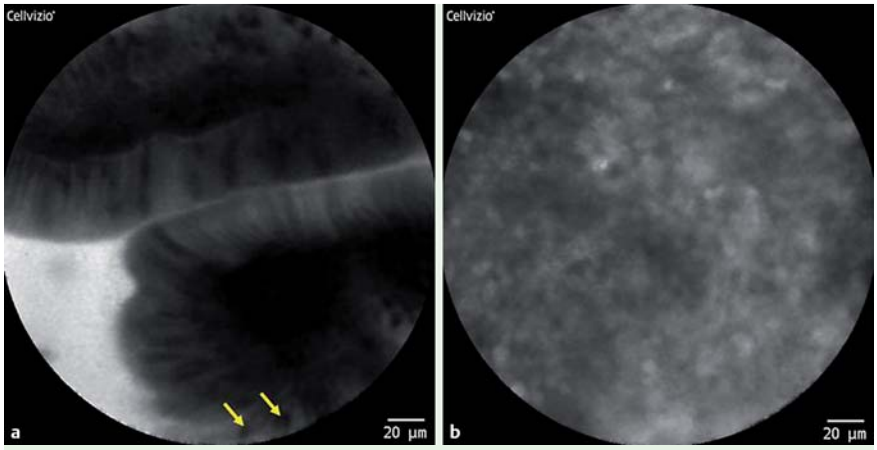

Fig. 3 Probe-based confocal laser endomicroscopy (pCLE) imaging. **a** pCLE revealed the villiform architecture. The epithelium was uniformly bright and goblet cells were dark (arrows). **b** Numerous small cells with a size of about 5 – 8 µm were present.

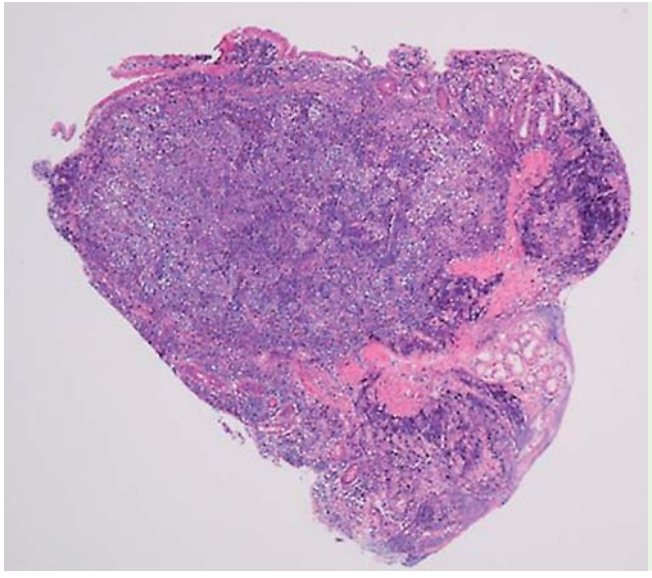

Fig. 4 Histological findings of the biopsy specimens. A section stained with hematoxylin–eosin revealed a subepithelial nodular proliferation of small- to medium-sized atypical lymphoid cells (original magnification × 40).

Follicular lymphoma arising in the duodenum is a distinct, relatively rare disease [1,2]. Here, we report our experience with confocal laser endomicroscopy (CLE) for follicular lymphoma of the duodenum with the corresponding histopathologic images, which, to our knowledge, is the first description of this.

The patient was a 70-year-old woman in whom multiple small whitish polyps were noted in the descending part of the duodenum on upper gastrointestinal endoscopic screening (**Fig. 1**). When the polypoid lesion was observed using narrow-band imaging, the villi were fused and enlarged compared to the surrounding normal villi (**Fig. 2**). Curled vascular loops were present in the enlarged villi. Subsequently, fluorescein-dripping CLE [3] was performed using probe-based confocal laser endomicroscopy (pCLE) (GastroFlex UHD, Cellvizio; Mauna Kea Technologies, Paris, France).

First, pCLE images of normal mucosa near the lesion were observed as a control, and revealed the villiform architecture with uniformly bright tall-columnar epithelium and dark goblet cells (**Fig. 3a**, arrows). Then the lesion was observed using pCLE. The width of each villus had increased compared to that of the normal villus structure, and numerous bright small cells were present (**Fig. 3b**).

Biopsy specimens of the lesion site revealed a subepithelial nodular proliferation of small- to medium-sized atypical lymphoid cells (**Fig. 4**), which were immunohistochemically positive for CD20, CD79a, CD10, and BCL-2, and negative for CD3, CD5, and cyclin D1, resulting in the pathological diagnosis of follicular lymphoma. The tumor cell size in the histological section was consistent with the size of the bright cells in the pCLE image.

On positron emission tomography-computed tomography (PET-CT), no accumulation was noted in any regions of the body including the duodenum, and no involvement of the bone marrow was revealed by biopsy of the bone marrow.

Based on these findings, the patient was diagnosed as stage I follicular lymphoma. With sufficient informed consent from the patient, a treatment strategy of "watchful waiting" was adopted.

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Competing interests: None

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