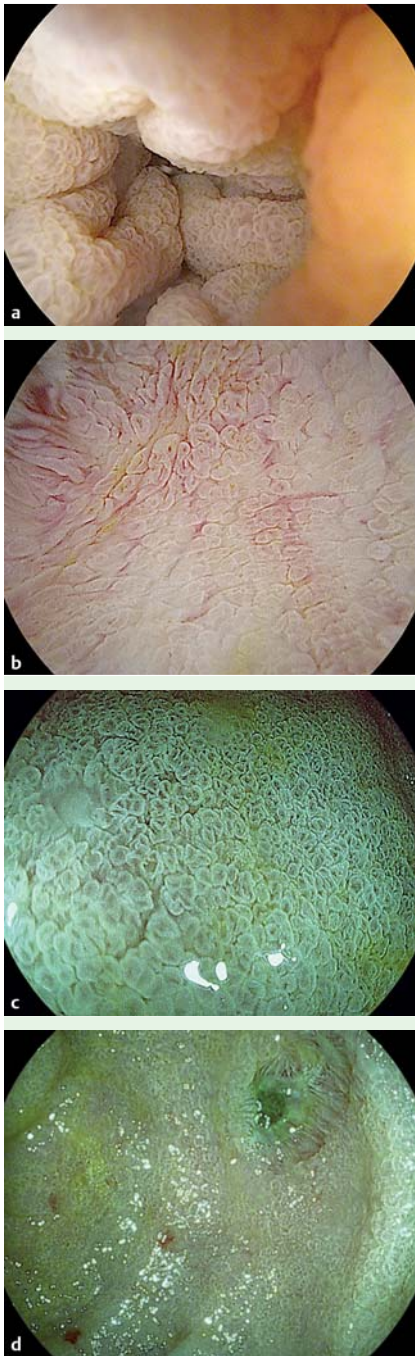
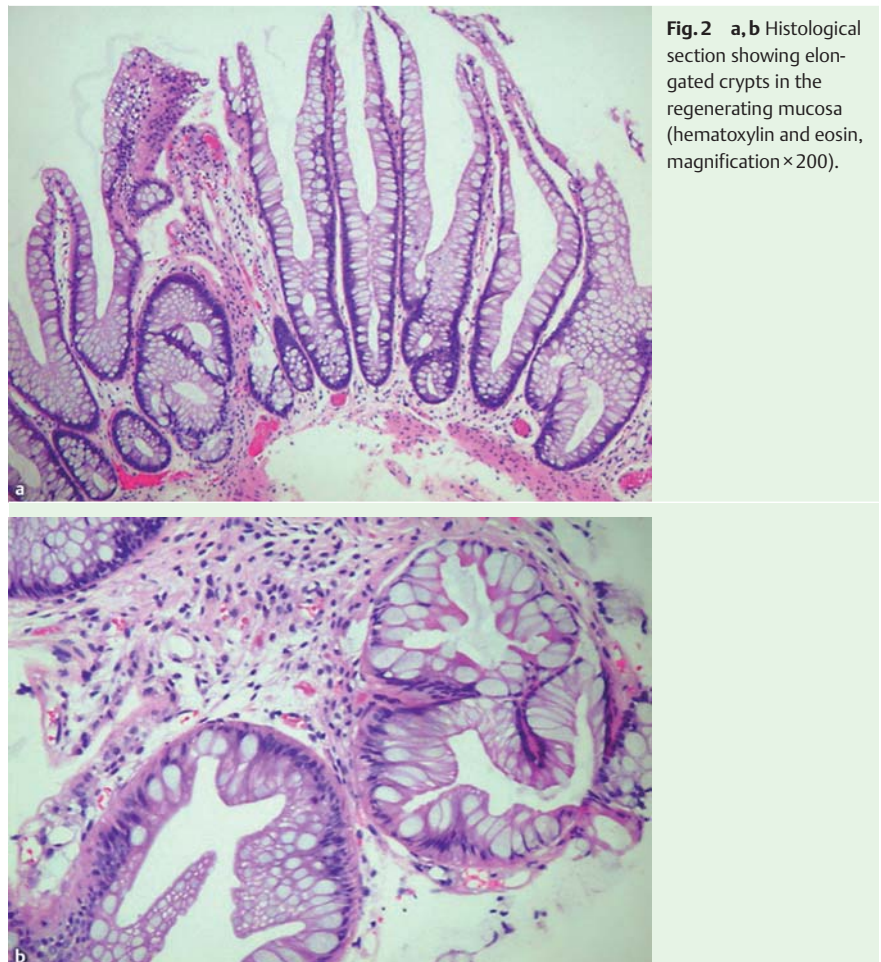


## Assessment of the early regenerative therapeutic response in graft versus host disease using high definition technology with virtual i-Scan chromoendoscopy



**Fig. 1** **a,b** High definition with i-Scan combination view in a 42-year-old man with a history of allogeneic sibling stem cell transplantation. Note the regenerative honeycomb mucosal pattern in the colon. **c,d** High definition with i-Scan virtual chromoendoscopic view again showing the honeycomb, flowery mucosal pattern and healing ulcer.



**Fig. 2** **a,b** Histological section showing elongated crypts in the regenerating mucosa (hematoxylin and eosin, magnification  $\times 200$ ).

The gastrointestinal tract is the second most commonly involved organ system in graft versus host disease (GvHD) following allogeneic stem cell transplantation, and its involvement is associated with a worse prognosis [1,2]. White light endoscopy findings are nonspecific and often unhelpful in the diagnosis of GvHD and evaluation of its response to therapy. Conventional histological examination of intestinal biopsy samples still represents the gold standard in GvHD diagnosis [3]. Moreover, after allogeneic stem cell transplantation, it could be potentially dangerous to carry out multiple biopsies and may require transfusion of erythrocytes, platelets, or coagulation factors. Here, we describe novel endoscopic findings associated with healing of the colonic mucosa in a patient with GvHD, obtained by high

definition (HD+) technology with i-Scan virtual chromoendoscopy (Pentax Medical, Tokyo, Japan).

A 42-year-old man, who underwent allogeneic sibling stem cell transplantation for chronic lymphocytic leukemia, presented on day 79 with acute symptoms including vomiting, abdominal pain, and diarrhea. Colonoscopy showed multiple ulcers in the left side of the colon. Biopsy specimens were taken and pathological examination revealed colonic GvHD, grade 3/4. The patient was started on high-dose intravenous steroids, followed by anti-thymocyte globulin (ATG), and – subsequently – extracorporeal photopheresis. Flexible sigmoidoscopy with HD+ and i-Scan virtual chromoendoscopy was carried out to characterize the endoscopic findings of the response to therapy in

GvHD. A novel endoscopic regenerative honeycomb mucosal healing pattern in GvHD (▶ Fig. 1) was noted; the pattern characteristically consisted of an exuberant elongated, flowery appearance. The diagnosis was confirmed by histological examination, which demonstrated elongated regenerative crypts in the mucosa (▶ Fig. 2).

HD+ with i-Scan endoscopy is an image-processing technology that analyzes the endoscopic mucosal and vascular pattern in real time [4]. It has shown promise in differentiating between colonic neoplastic and non-neoplastic lesions, in characterizing mucosal healing in inflammatory bowel disease, and for in vivo diagnosis of duodenal villous atrophy in celiac disease [5]. Here we have reported the novel finding of a honeycomb or flowerlike pattern in the regenerating mucosa using HD+ with i-Scan technology in the assessment of colonic mucosal outcome after therapy for GvHD.

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**Competing interests:** None

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