

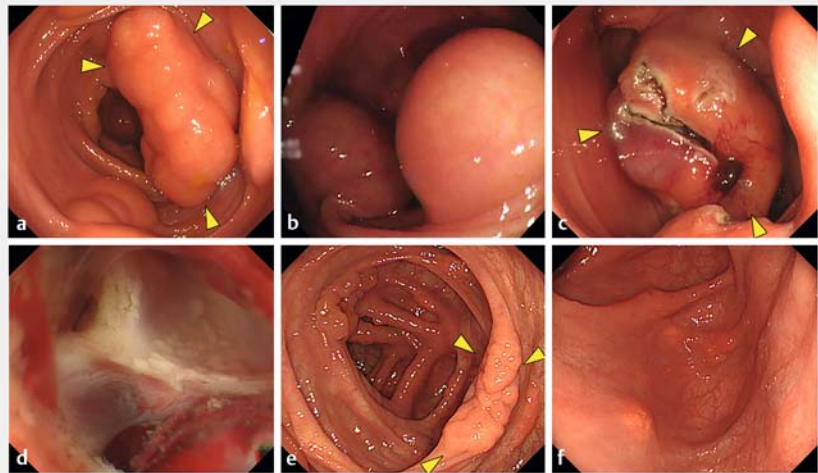
Endoscopic fenestration treatment for pneumatosis cystoides intestinalis in patient with recurrent colonic intussusception



► **Fig. 1** Contrast-enhanced computed tomography examination findings obtained when patient noted abdominal pain. Intussusception in the ascending colon (yellow arrowheads) and sequential obstructive ileus of the small intestine (red arrowheads) were observed.

Pneumatosis cystoides intestinalis (PCI) is a rare disease characterized by intestinal mural pneumatized cysts that appear most commonly in the colon [1, 2]. Although primarily asymptomatic, PCI occasionally causes intussusception that usually requires surgical treatment [3, 4]. Hyperbaric or high-concentration oxygen therapy is reportedly effective, though complete remission is uncertain [5]. We present the first report of an endoscopic fenestration procedure used for successful treatment of PCI with recurrent intussusception.

A 16-year-old male patient experienced repeated severe abdominal pain over a 2-year period. Computed tomography revealed intussusception in the ascending colon along with mural gas-filled cysts (► **Fig. 1**), while colonoscopy showed multiple submucosal tumor-like lesions (► **Fig. 2a, b**). The diagnosis was idiopathic PCI accompanied by intussusception. Oxygen therapy was ineffective, thus endoscopic treatment was performed. The therapeutic protocol was



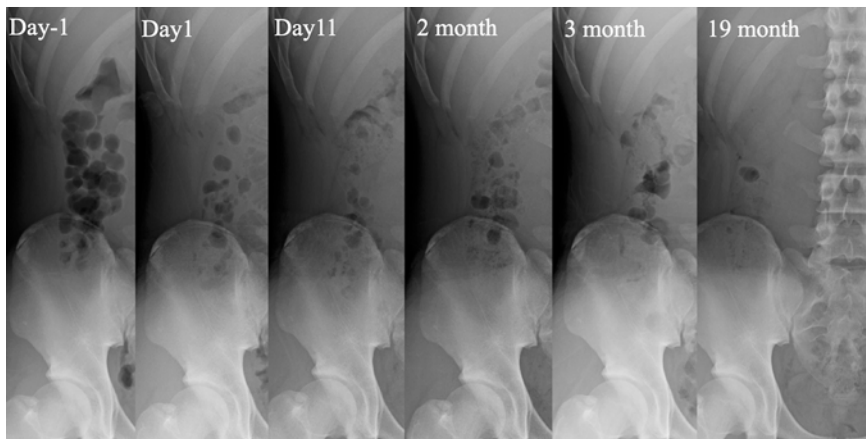
► **Fig. 2** Endoscopic images obtained before and after endoscopic treatment. **a, b** Multiple tense gas-filled cysts with a bumpy surface were observed in the ascending colon (**a**) and hepatic flexure (**b**). A large multinodular cyst in the ascending colon (yellow arrowheads) was considered to be the lesion causing intussusception. **c** A mucosal incision was performed in multiple directions for cyst fenestration. **d** During the procedure, examination of the cyst interior revealed a multilocular structure with a thick fibrous partition. **e, f** Follow-up colonoscopy findings obtained 3 months after treatment showed remarkable reductions in multiple cysts in the ascending colon (**e**) and hepatic flexure (**f**).



► **Video 1** Endoscopic fenestration using a needle-knife for refractory, symptomatic pneumatosis cystoides intestinalis.

approved by the medical ethics committee of our institution and registered with the Center for Clinical Trials, Japan Medi-

cal Association (JMA-IIA00240), with written informed consent obtained from the patient.



► **Fig. 3** X-ray images obtained before and after endoscopic treatment. Mural emphysema decreased the day after treatment and had nearly completely disappeared 3 months later. A follow-up examination performed 19 months later showed that the disease was well controlled without recurrence.

Needle aspiration was ineffective for the large cysts and endoscopic fenestration was subsequently performed (► **Video 1**). First, a mucosal incision was made with a 3-mm cutting-wire needle-knife (KD-10Q; Olympus Co., Tokyo, Japan), followed by fenestration of multilocular cysts with a thick fibrous partition (► **Fig. 2 c, d**), as well as multidirectional fenestration on the inner side of an imaginary line of the proper muscular layer. Mucosal incision and fenestration procedures were done using a high-frequency generator (VIO300; ERBE Elektromedizin, Tübingen, Germany) in Endocut mode (60 W, effect 2). Minor bleeding was the only procedure-related complication. Follow-up colonoscopy showed remarkable reduction of PCI (► **Fig. 2 e, f**), while X-ray imaging revealed a long-term therapeutic effect (► **Fig. 3**). After 6 years, no symptoms have developed. Endoscopic fenestration using a needle-knife for refractory symptomatic PCI may be a good therapeutic alternative to surgery.

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Competing interests

The authors declare that they have no conflict of interest.

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