

Endoscopic removal of two duodenal stents that had migrated into the colon, using the invagination method



► **Fig. 1** Stent placement to treat malignant duodenal obstruction. A partially covered duodenal stent was deployed as a second stent due to tumor ingrowth into an uncovered duodenal stent.



► **Fig. 2** Computed tomography revealed that the two duodenal stents had migrated into the colon.

A 77-year-old woman with advanced pancreatic cancer presented with combined biliary and duodenal malignant obstruction. An uncovered self-expandable metal stent (SEMS) (Nexent Duodenal/Pyloric stent, 22 mm × 12 cm; Next Biomedical, Korea) and a partially covered SEMS (Niti-S ComVi stent, 20 mm × 12 cm; Century Medical, Korea) were deployed for the duodenal obstruction (► **Fig. 1**). After three cycles of chemotherapy, the two duodenal SEMSs had migrated to the



► **Video 1** Endoscopic removal of two duodenal stents that had migrated into the colon, using the invagination method.

transverse colon (► **Fig. 2**). We decided to remove the SEMSs to avoid perforation. A short-type single-balloon enteroscope (SIF-H290S; Olympus Medical, Japan) was inserted with the overtube (► **Video 1**). The SEMSs were identified at the bending part of the colon. We first tried to grasp the distal end with a rat-tooth forceps, but the SEMSs were tightly embedded in the wall. Therefore, the enteroscope was inserted across the SEMSs and the proximal end of the partially covered SEMS was grasped by the forceps and removed using the invagination method. The SEMSs and the enteroscope were pulled into the overtube so as not to injure the intestinal wall. Both SEMSs were successfully removed without any complications (► **Fig. 3**, ► **Fig. 4**, ► **Fig. 5**; ► **Video 1**).

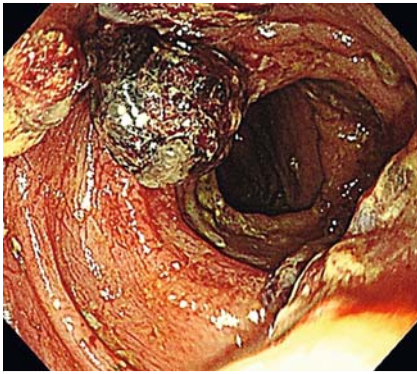
Several methods have been reported for removal of migrated enteral SEMSs [1–4]. Most of these techniques are quite difficult when the distal end is located at

the bending part of the colon. The invagination method has been reported to facilitate removal of an embedded biliary SEMS [5]. With this method, the proximal end of the SEMS is grasped with forceps and the SEMS removed by pulling it inside itself. This method could be useful when it is difficult to remove a SEMS from the distal end. It is important to lessen the risk of perforation by advancing the overtube near the SEMS, pulling the enteroscope and the SEMS into the overtube, and gradually, little by little, detaching the SEMS from the intestinal wall.

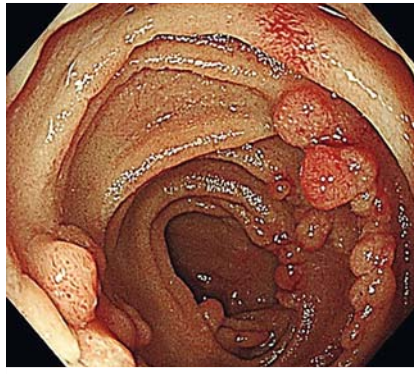
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Competing interests

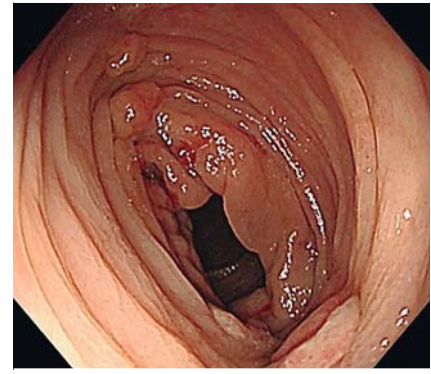
The authors declare that they have no conflict of interest.



► **Fig. 3** Colonoscopic view just after stent removal.



► **Fig. 4** Endoscopic view of duodenum where the duodenal stents were previously placed.



► **Fig. 5** Colonoscopic view 1 week after stent removal.

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Endoscopy 2021; 53: E209–E210

DOI 10.1055/a-1244-9219

ISSN 0013-726X

published online 11.9.2020

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Georg Thieme Verlag KG, Rüdigerstraße 14, 70469 Stuttgart, Germany

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