

Endoscopic removal of a broken self-expandable metal stent using the stent-in-stent technique



Fig. 1 Endoscopic image of one of the broken wires which resulted in collapse of the self-expandable metal stent (SEMS).



Fig. 2 The broken wires of the first self-expandable metal stent (SEMS) have perforated the covering of the second SEMS.



Fig. 3 **a** Fully covered self-expandable metal stent (SEMS) strongly attached to the partially covered SEMS. **b** Close-up of the end of the partially covered SEMS with a loose wire.

A 55-year-old man with dysphagia due to an unresectable distal esophageal adenocarcinoma underwent placement of a 15-cm partially covered self-expandable metal stent (SEMS), diameter 18 mm (Ultraflex; Boston Scientific, Natick, Massachusetts, USA). After 3 months, he presented with recurrent dysphagia. At endoscopy, the meshes of the SEMS had broken, leading to collapse of the SEMS and obstruction of the lumen (Fig. 1). Because the patient's clinical condition had improved and further treatment with chemotherapy or radiotherapy was considered, we decided to remove the SEMS using the stent-in-stent technique. A second SEMS, 17-cm long, fully covered, diameter 20 mm (Hanaro, M.I.Tech, Korea) was inserted, overlapping the full length of the first SEMS. After 2 weeks, on endoscopic examination, the loose struts of the disrupted SEMS had perfora-

ted the covering of the fully covered SEMS, and the radial pressure of the fully covered SEMS had succeeded in detaching the partially covered SEMS from the esophageal wall and tumor (Fig. 2). By pulling the proximal retrieval lasso of the fully covered SEMS, both SEMSs were extracted simultaneously without the need to exert much force. Examination of the retrieved stents showed they were strongly attached to each other, indeed with loose struts of the first stent perforating the covering of the fully covered SEMS (Fig. 3). Immediately after removal of both stents, no esophageal stenosis was observed. The post-procedural course was uneventful, and the patient is currently without dysphagia. Spontaneous fracture with collapse of an esophageal SEMS is a rare complication [1,2]. However, if a SEMS is extracted by

pulling its upper or lower end, and traction is forceful, as in the case of (partial) stent ingrowth, the struts may break causing the metal wire mesh to become disrupted. When the struts are already broken, it seems likely that by pulling on one end of the SEMS, the metal framework will be destroyed even further, making it impossible to remove the SEMS all in one. In such cases, the stent-in-stent technique is a simple and safe method to facilitate removal of embedded stents in benign disease [3]. This is the first report of removal of a broken SEMS using the stent-in-stent technique. It appears to be simple, safe and effective, also in malignant disease.

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