Ingrowth and device disintegration in an intralobar abscess cavity during endosponge therapy for esophageal anastomotic leakage

A 53-year-old man underwent esophageal resection for esophageal adenocarcinoma that extended from 29 cm to 33 cm from the incisors. The pathology specimen was staged as a T2N0 adenocarcinoma with an R0 resection. At 7 days post resection, the patient developed signs of systemic inflammation, which progressed within 12 hours to a septic condition requiring artificial ventilation and vasopressor support.

Upon diagnostic endoscopy, anastomotic leakage and an adjacent abscess cavity with putrid fluid was diagnosed, which corresponded to an intralobar cavity of the right lung. The intraoperative drainage tubes were dislocated and an additional chest tube was placed. Endosponge therapy using a polyurethane endosponge (Braun AG, Melsungen, Germany) was immediately initiated (**Fig. 1**).

This off-label treatment modality is approved by the local institutional review board as part of an ongoing feasibility study. The patient improved rapidly and was taken off vasopressors and extubated a week after the initiation of endosponge therapy.

Endosponges were initially changed every 2 days. The interval was then prolonged to 4 days to allow shrinkage of the abscess cavity. On Day 21 of endosponge therapy, the endosponge could not be mobilized even after instillation of fluid over the endosponge tube and robust mechanical

Video 1

Video illustrating the position of the sponge fragment in the cavity and blunt preparation for the extraction of the ingrown sponge. The futile attempts to extract the sponge fragment with rat-tooth forceps are shown. Subsequently, the endosponge fragment is freed by blunt preparation with the closed rat-tooth forceps and extraction of the sponge is shown. Finally, a withdrawal sequence from the clean cavity demonstrates the granulation tissue lining and the orifice of the leakage cavity from the esophagus.

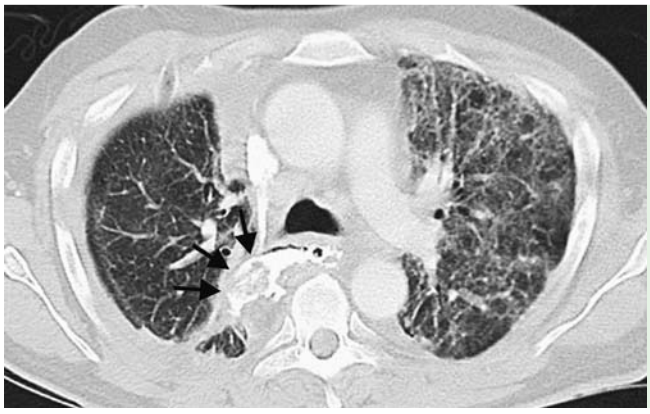

Fig. 1 Computed tomography image of the endosponge in situ in the leakage cavity in the right intralobar space. The sponge is marked with three arrows.

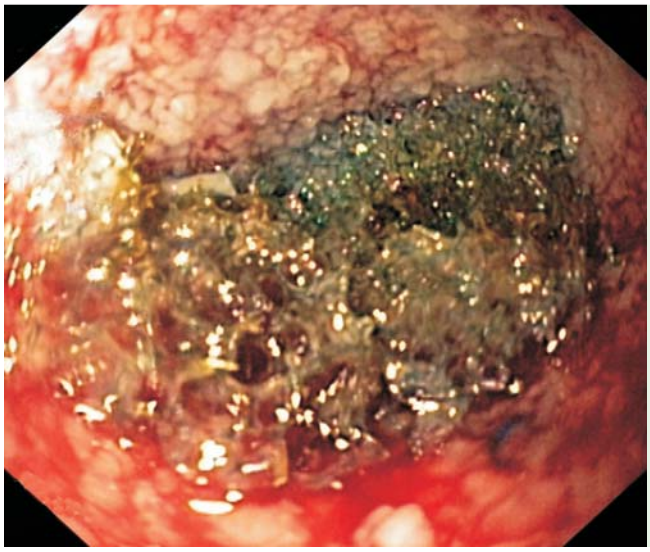

Fig. 2 Endoscopic image of the ingrown intralobar sponge fragment before extraction attempts were started.

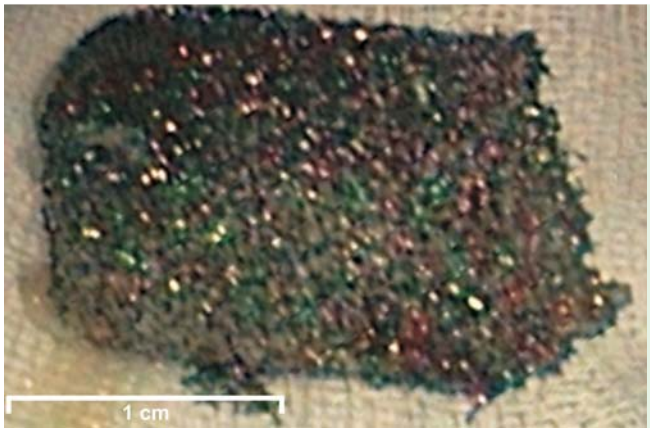

Fig. 3 Image of the extracted sponge fragment.

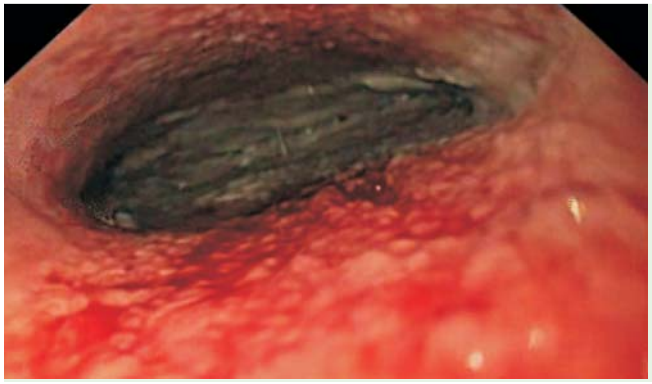

Fig. 4 Endoscopic image of the clean abscess cavity after extraction of the sponge. The vulnerable granulation tissue lining can be seen. In the depths of the cavity, the fibrin-coated intralobar space is seen.

manipulation. Eventually, the device was removed with a strong pulling force on the endosponge tube, but it disintegrated during the maneuver leaving about half of the endosponge in the intralobar abscess cavity, fixed by dense granulation tissue (**Fig. 2** and **Video 1**).

Initial extraction efforts using rat-tooth forceps only retrieved sponge fragments in the grasper. In order to avoid injury to the adjacent lung and the deposition of foreign body, the endosponge was freed by circular, blunt preparation using the closed endosponge forceps, and was eventually extracted in toto (**Fig. 3**).

Subsequent endoscopic inspection of the cavity revealed clean granulation tissue (**Fig. 4**).

Change intervals were shortened again to 2 days. The cavity continued to shrink in size and endosponge therapy was terminated after a total of 5 weeks.

As reported previously, endosponge therapy is a viable option for the treatment of abscesses and leakage after upper gastrointestinal resections [1 – 4]. However, the devices used for these procedures are not yet approved for upper gastrointestinal use and the spectrum of possible safety problems has not yet been fully explored. This case illustrates that the intensive granulation, which is induced and required for this therapy, can also cause problems. Thus, special care should be taken during removal of the endosponge, and the interval of sponge changes should be tailored to the particular condition of the cavity being treated.

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Competing interests: None

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