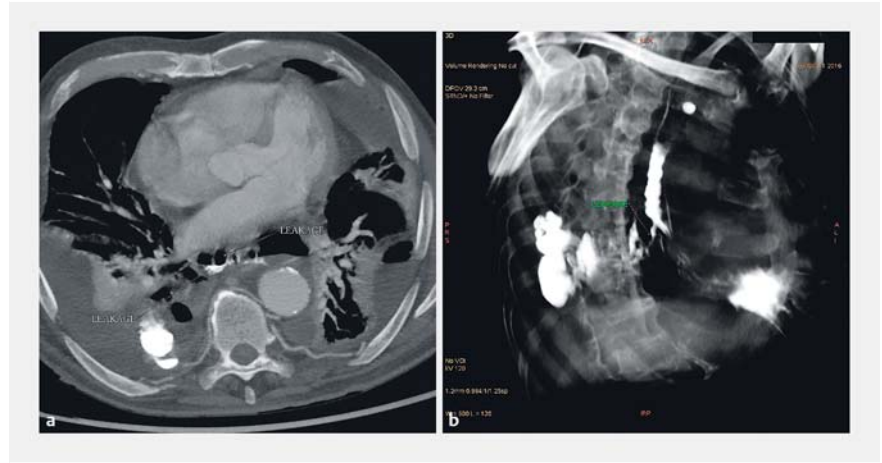


Hybrid therapy of late diagnosed esophageal perforation, complicated by mediastinitis and bilateral empyema

An 81-year-old man was admitted to our hospital with clinical deterioration 6 days after diagnostic gastroscopy. Computed tomography (CT) scan showed distal esophageal perforation, bilateral empyema, and a contrast leak into the right pleural cavity (► **Fig. 1**). Bilateral video-assisted thoracoscopy was performed, evacuating the empyema, debriding the pleural spaces, and incising the mediastinal pleura. The site of esophageal perforation was located, and mediastinal and pleural drains were placed (► **Video 1**). During the same session upper endoscopy was performed, which showed an approximately 12 mm perforation in the distal third of the esophagus. We used an over-the-scope clip (OTSC; Ovesco, Tübingen, Germany) to close the defect. A gastrografin esophagogram performed immediately after clip deployment showed no contrast leak (► **Fig. 2**). A fully covered self-expanding metal stent (SEMS; Wallstent; Boston Scientific, Marlborough, Massachusetts, USA) was placed to cover the perforation site after OTSC deployment (► **Video 2**).

A CT scan 7 days after closing the perforation showed improvement of the pleural effusion (► **Fig. 3 a**). A gastro-



► **Fig. 1** Computed tomography scan images. **a** Distal esophageal perforation, bilateral empyema, and contrast leak into the right pleural cavity. **b** Contrast leak into the right pleural cavity.

grafin study showed no contrast leak (► **Fig. 3 b**). The patient re-started an oral diet, and was discharged 13 days after closure of the perforation. The stent was removed without complications 1 month later. A CT scan showed a small encapsulated left pleural effusion, which was successfully drained.

Esophageal perforation remains a life-threatening condition despite the advances of surgery and intensive care. Iatro-

genic injury is the most common cause [1, 2]. Most cases are treated by surgery, with high morbidity and mortality especially in elderly and multimorbid patients [1]. Endoscopic therapy is a valuable option for perforations that are recognized early [3]. Placement of a fully covered SEMS is associated with a high stent migration rate, especially in cases without a stenosis and if located in the region of the cardia [2, 4]. Partially covered

► Video 1

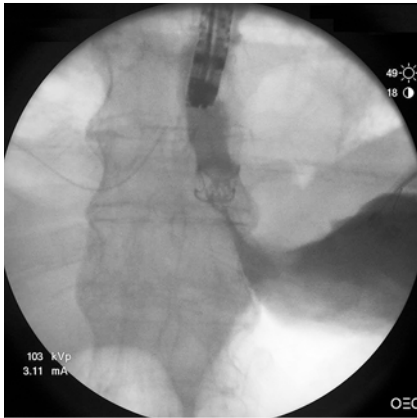


► Video 1: Bilateral video-assisted thoracoscopy.

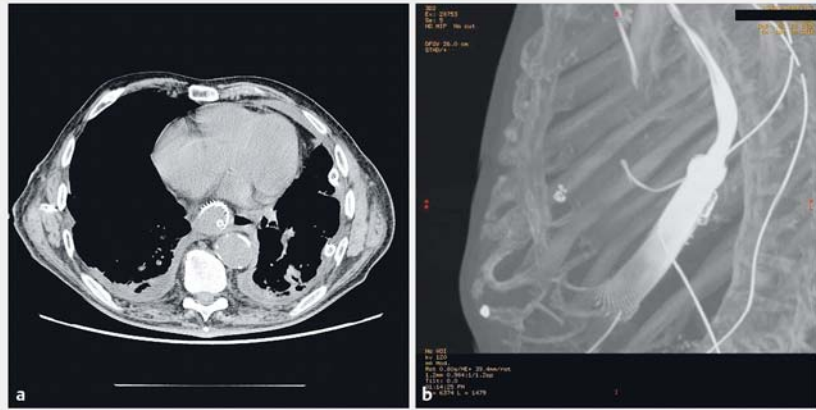
► Video 2



► Video 2: Endoscopies showing the perforation site, deployment of the over-the-scope clip, placement of a fully covered self-expanding metal stent, and stent removal 1 month after placement.



► **Fig. 2** Gastrografin esophagograms performed immediately after clip deployment, showing no leak.



► **Fig. 3** Follow-up imaging on Day 7 after closure. **a** Computed tomography scan showed marked improvement of the pleural effusion. **b** Gastrografin study showed no contrast leak.

SEMSs could be challenging to remove [2, 4]. Endoscopic clipping for closure of perforations may not be reliable, particularly in cases with severe inflammation and friable tissue [2, 5].

The current case is unusual because of the delayed presentation of an elderly multimorbid patient with a complicated distal esophageal perforation. To close the perforation, we used a combined endoscopic approach including OTSC placement and stenting. An OTSC alone may not have been sufficient because of the inflammation and fragility of the surrounding tissue. Although there was no contrast leak following the clip placement, we deployed a fully covered SEMS. The stenosis created by the OTSC might have lowered the risk of stent migration. The minimally invasive endoscopic/thoracoscopic approach resulted in rapid recovery.

Endoscopy_UCTN_Code_TTT_1AO_2AI

Competing interests

None

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DOI <http://dx.doi.org/10.1055/s-0043-103947>
Endoscopy 2017; 49: E127–E128

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Stuttgart · New York
ISSN 0013-726X