Combination of the "bear claw" (over-the-scope-clip system) and fully covered stent for the treatment of post-operative anastomotic leak

The "bear claw" or over-the-scope clip (OTSC) system (Ovesco Endoscopy, Tübingen, Germany) is an innovative clipping device made of superelastic biocompatible nitinol [1–3]. This clipping device was developed to close wall defects of the luminal gastrointestinal tract, such as perforations, anastomotic leaks, fistulas, and large defects occurring after endoscopic full-thickness resection [1]. The use in humans is still limited, but due to the OTSC's excellent capabilities for closing large mucosal defects, more reports on its efficacy are being published [2–4]. Herein we present the use of the "bear claw" to anchor a fully-covered self-expandable metal stent (SEMS) that had previously partially migrated into the stomach.

A 79-year-old man with history of diabetes mellitus, coronary artery disease, chronic renal insufficiency, and alcohol abuse underwent a distal esophagectomy with gastric pull-up for a T2N0M0 adenocarcinoma of the cardia. An anastomotic leak became apparent on the eighth post-operative day and was associated with a 2-L right-sided pleural effusion. The exudative effusion was drained, and the leak was treated with a fully covered esophageal SEMS. However, the stent partially migrated into the stomach, as revealed by recurring right-sided pleural effusion. Esophagogastroduodenoscopy (EGD) confirmed the position of the partially migrated stent. A large leak could be seen through the membrane of the SEMS.

Due to his poor clinical condition, the patient was not a candidate for renewed surgery. A decision to reposition the stent and use a "bear claw" (OTSC system) to hold the SEMS in place was made. The stent was slowly and gently pulled back into the desired position. Then the scope was removed and the OTSC system was attached, similarly to a variceal ligation device (**Fig. 1**). The endoscope was advanced easily through the hypopharynx into the upper esophagus (**Fig. 2**). The upper part of the stent was grasped with one arm of the twin grasper and pulled inside the distal cap. The cap was pressed against the esophageal wall, making sure that the stent and some mucosal tissue were inside the cap while constantly applying suction. At this moment the OTSC system was released by turning the handle attached to the entrance to the working channel of the scope, similarly to the way in which a variceal ligation device such as the "six-shooter" is manipulated. The OTSC system clinched enough tissue, including the stent (**Fig. 3**, **Video 1** and **Video 2**).

The additional time involved in placing the OTSC system, including loading the device into the scope, was 4 minutes. The SEMS was thus successfully placed and held across the leak, and closure of anastomotic leak was achieved. The patient did well, and a repeat barium swallow on post-operative day 30 revealed no leak.

This case is interesting for several reasons. First, we present a potential new application of this large clip: anchoring a stent in the esophagus. Stent migration is one of the most common complications of covered SEMSs [5]. In this patient, the stent had initially led to a partial improvement in the anastomotic leak, but, once the stent had partially migrated, the leak reopened, with constant contact with refluxing gastric and small bowel contents. One could argue that the stent could have been removed and an attempt initiated to close the leak with the OTSC system. However, the patient's condition was poor, and the leak was large and fibrotic. Recent data suggest that the OTSC system may not be useful to close such fibrotic and complex defects [3]. In addition, stent therapy is a proven method to heal large anastomotic leaks [6].

Secondly, this case adds to the growing clinical experience using this novel device. The OTSC has a different conception from traditional through-the-scope (TTS) clips: first, the OTSC is made from nitinol with a "leghold trap" memory shape, is loaded on a cap placed on the scope tip, and has the capacity to grasp and compress the tissue more widely and with greater strength, without provoking ischemia or cutting the tissue; and secondly, the target tissue needs to be caught and pulled into the cap by specifically developed devices that make addressing tangential lesions more likely [7]. Due to its size and the use of the cap and tissue graspers (forceps or anchor), the OTSC system allows for the entrapment of a larger amount of tissue, and provides high stability and closure, and minimal strain on surrounding tissue [1–3, 7].

Fig. 1 The over-the-scope clip (OTSC) system was attached to the tip of the endoscope, similarly to a variceal ligation device.

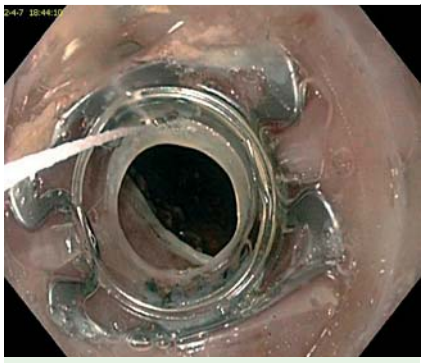

Fig. 2 The endoscope with the over-the-scope clip (OTSC) system attached to its tip was advanced easily through the hypopharynx into the upper esophagus.

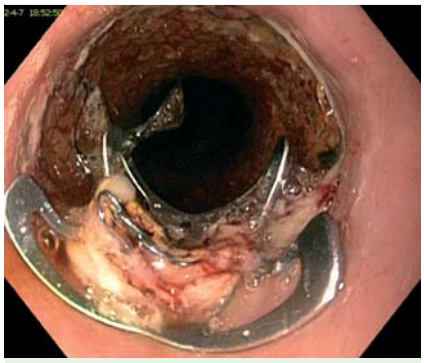

Fig. 3 The over-the-scope clip (OTSC) system clinched enough tissue, including the stent.

Finally, we show that the placement of such a clip is easy and can be very rapidly performed during an EGD, resulting in prevention of SEMS migration and subsequently improvement of the leakage.

Video 1

The esophageal mucosal tissue and stent were suctioned into the cap of the over-the-scope clip (OTSC) system.

Video 2

The over-the-scope clip (OTSC) system captured enough tissue and the stent. The stent is fixed to the esophageal wall.

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J. Toshniwal[1], M. Zabielski[1], L. C. Fry[1], K. Mönkemüller[1,2]

[1] Department of Internal Medicine, Gastroenterology and Infectious Diseases, Marienhospital Bottrop, Germany
[2] Division of Gastroenterology, Hepatology and Infectious Diseases, Otto-von-Guericke University, Magdeburg, Germany

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Corresponding author
K. Mönkemüller, MD, PhD
Department of Internal Medicine, Gastroenterology and Infectious Diseases
Marienhospital Bottrop
Josef-Albers-Straße 70
46236 Bottrop
Germany
Fax: +49-2041-1061019
moenkemueller@yahoo.com