CASE REPORT

Management of a cervical tracheoesophageal fistula with a modified self-expanding metal stent: Report of a case

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Summary

Treatment of tracheoesophageal (TE) fistula is always a challenge, in particular TE fistula caused by malignancy. In the past decade, the development of a self-expanding metal stent (SEMS) has made management of esophageal stenosis or perforation much easier. Nevertheless, management of a cervical esophageal lesion is still debatable. A cervical esophageal stent may compromise the upper esophageal sphincter (UES) function and is usually listed as a contraindication. Here, a 53-year-old male had cervical esophageal cancer complicated with a TE fistula. After initial management with a SEMS, the patient had temporary improvement, but later suffered a recurrent TE fistula. The TE fistula was successfully managed by the placement of a second modified SEMS just below the UES without removal of the previous SEMS. The patient tolerated the procedure well and regained proper swallowing function.

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1. Introduction

Tumors in the cervical portion of the esophagus account for 7–10% of all esophageal cancers. Tracheoesophageal (TE) fistula occurs in approximately 5–15% of patients with esophageal cancer. Esophageal stents in this area have traditionally been considered to be contraindicated. An increased risk of perforation, pulmonary aspiration [by compromising upper esophageal sphincter (UES) function], migration of the prosthesis into the hypopharynx, and an intolerable foreign body sensation, are general concerns. Although a cervical esophageal lesion can be successfully managed by placement of a Polyflex stent across the UES temporarily without major complications, avoidance of
a permanent esophageal stent across the UES is generally agreed upon. We report a patient with TE fistula recurrence after stenting. He was treated successfully with a modified self-expanding metal stent (SEMS) in addition to a previous SEMS.

2. Case report

A 53-year-old male presented to our hospital for progressive cough and dysphagia in the past month. The patient had no history of systemic diseases but reported habitual use of alcohol, cigarettes, and betel nuts for more than 20 years. No body weight loss was noted. Physical examination failed to show specific findings. Chest computed tomography (CT) was suggestive of cancer in the upper 1/3 of the esophagus. Panendoscopy revealed an infiltrative tumor, located at 20–25 cm from the incisor. Biopsy of the tumor showed squamous cell carcinoma (SCC). Bronchoscopy revealed direct invasion of the trachea by the tumor.

A diagnosis of locally advanced SCC of the esophagus, upper 1/3, stage III, T4N1M0, was made according to the American Joint Committee Cancer classification system. Concurrent chemoradiation therapy was suggested according to the National Comprehensive Cancer Network guideline. A feeding tube was not used because the patient was still capable of oral intake.

One course of cisplatin combined with 5-FU at the outpatient department was administered. Radiation therapy at a dose of 5000 cGy was also started.

One month later, the patient complained of severe postprandial cough. Body weight loss of more than 2 kg was also reported. Bronchoscopy and esophagography were performed and a TE fistula was found. Owing to this clinical condition, a SEMS was inserted to stop airway contamination. Esophagography demonstrated adequate blockage of the TE fistula.

One month later, severe cough recurred. A plain chest film X-ray showed pneumonia. In view of the patient’s previous history, chest CT, esophagography and bronchoscopy (Fig. 1A) were performed to confirm TE fistula recurrence. The images revealed a TE fistula proximal to the previous SEMS. The new TE fistula was located at 20 cm from the incisor, which was rather close to the upper esophageal sphincter (UES). Considering that retraction of the first SEMS might cause further extension of the TE fistula, we did not remove the stent. Instead, we deployed another modified SEMS with a smaller funnel-shape proximal end (Fig. 2). The proximal end of the new SEMS was placed at 17 cm from the incisor.

After deployment of the second SEMS, esophagography (Fig. 3) and bronchoscopy (Fig. 1B) were performed again and showed no signs of TE fistula recurrence. The patient complained of neck pain, but the patient became capable of oral intake again. The patient died 4 months after placement of the second SEMS due to cancer progression.

3. Discussion

A SEMS is a common choice for patients with unresectable middle and distal esophageal cancer to facilitate oral intake. Deployment of SEMS is easy and complications are few. The associated discomfort, migration rate, and perioperative risk are much lower than with silicon models.

Figure 1 (A) Bronchoscopic view of the TE fistula. The proximal boundary of the first SEMS was visible via the TE fistula. (B) Bronchoscopic view of the TE fistula after placement of a modified SEMS. The second SEMS is seen via the TE fistula and sealed the TE fistula properly.

Figure 2 A modified SEMS with a 7-mm length funnel shape proximal end and a diameter of 18 mm. The length of the stent is 12 cm. It is a subtype of Choostent invented by Dr Shim.
There are several models available on the market. Traditionally, a SEMS has a membrane-covered central segment and a symmetrical larger diameter bared surface at both ends. In our hospital, we usually choose a Niti-S stent or Choostent, for which it is easier to readjust the stent position after deployment. Traditionally, a SEMS in the cervical esophagus was regarded as a contraindication, because the larger diameter end may cause UES dysfunction and discomfort. To overcome this, Dr Shim modified the SEMS with a smaller diameter funnel-shape proximal end. In comparison with the standard SEMS, it has a shorter length of the proximal funnel (7 mm vs. 20 mm) and a narrower fully expanded diameter (18 mm vs. 20 mm). The modification decreases UES compromise and foreign body sensation.

Our patient was treated first with a Niti-S stent because there was no modified SEMS available in Taiwan. The proximal end of the SEMS was placed at 20 cm from the incisor and achieved successful coverage of the TE fistula initially. However, it could not be determined how far the proximal end of the SEMS exceeded the proximal end of the TE fistula. The cause of recurrence was not certain, but three possibilities were considered. First, mild migration of the SEMS caused by tumor shrinkage after concurrent chemoradiation therapy (CCRT). Second, additional pressure due to the larger diameter of the SEMS proximal end causing further tear of the TE fistula. Third, further shortening of the SEMS when it expanded to its full width after placement. One or a combination of these factors may have contributed to stent failure.

Retraction of the first SEMS with panendoscopy was initially contemplated, but considering that there was a high risk of further tear it was not attempted. Instead, we decided to place a second stent to cover the lesion. However, a traditional SEMS could have compromised the UES and thus we asked the stent company to help us obtain a modified stent.

We chose a modified SEMS (Choostent, modified by Shim et al) to accomplish the task. The proximal end was placed at 17 cm from the incisor, where cricoids were visible on fluoroscopy. Panendoscopy showed its proximal end just beneath the UES. Postprandial cough was relieved after placement of the second SEMS. No major complications occurred, and foreign body sensation was tolerable. With this experience, it is now considered acceptable to place a modified SEMS just beneath the UES.

4. Conclusions

We conclude that cervical SEMS placement is practical with a modified SEMS. However, the proximal end of the SEMS should not exceed the UES. In addition, a new SEMS resting on a previous SEMS is acceptable. Further studies are needed to determine the adequate gap between the UES and SEMS. It is also important to develop a method to determine the position of the implanted SEMS.

References