

Case Report

Tracheo-esophageal fistula: Successful palliation after failed esophageal stent

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ABSTRACT

The incidence of tracheo-esophageal (TO) fistula is on the rise, especially after palliative management for esophageal malignancies. We report a case of cancer of esophagus who after chemotherapy and radiotherapy developed TO fistula. Placement of an esophageal stent helped him in taking food orally, but his cough and dyspnoea continued to worsen. Fiberoptic bronchoscopy demonstrated a severely compressed trachea secondary to protrusion of esophageal stent which responded very well to an Ultraflex-covered tracheal stent and the patient achieved relief from cough and dyspnoea.

KEY WORDS: Fiberoptic bronchoscopy, tracheo-esophageal fistula, Ultraflex stent

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INTRODUCTION

In patients receiving radiotherapy and chemotherapy for esophageal and lung cancers, it is not uncommon to witness development of life-threatening tracheo-esophageal fistula (TOF).^[1] Various procedures have been tried including surgical repair,^[2] endoprostheses,^[3] endo-bronchial gluing^[4] and tracheal stents.^[5] Other workers have shown good long-term results of palliative treatment with covered expandable metallic stents.^[5,6]

We report a case of CA esophagus who after chemotherapy and radiotherapy developed TO fistula; esophageal stenting was done but patient was still having cough and dyspnoea. Fiberoptic bronchoscopy (FOB) showed a large rent in the posterior wall of the trachea with marked narrowing of the tracheal lumen because of protrusion of the esophageal stent. He was successfully managed with

the insertion of an Ultraflex-covered tracheal stent and achieved relief from cough and dyspnoea.

CASE REPORT

A male patient, KS, aged 60 years, suffering from esophageal cancer was electively operated upon in October 2007 after discussion in the multispecialty tumor board. He underwent McKeon's oesophagectomy on 7 December 2007. The gross specimen was an ulcero-proliferative growth measuring 4.5 × 1.7 cm in size located 2.3 cm from the Gastro-Esophageal (GE) junction and was reported to be moderately differentiated squamous-cell carcinoma. Patient continued to be on regular follow-up. In April 2010 he came with complaints of hemoptysis. Bronchoscopy was done which showed ulcerated mucosa in the posterior wall of the trachea. Computed tomography (CT) chest and abdomen showed esophageal gastric anastomosis in the lower neck with irregular mass abutting the posterior and left wall of the trachea and encasing the left carotid artery. Liver showed multiple round hypo-dense enhancing lesions in both the lobes. Ultra Sound (USG) and CT-guided fine needle aspiration cytology (FNAC) from liver nodules showed metastatic deposits of poorly differentiated squamous-cell carcinoma. He received three cycles of TIP- (Paclitaxel/ifosfamide/cisplatin) based chemotherapy and palliative external beam radiotherapy to the L2-S1 spine

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and pelvis with a dose of 30 Gy/10# during June 2010. Bone scan in July 2010 showed increased uptake in the sternum, L2 vertebra, bilateral acetabulum and bilateral iliac bones.

In the month of August 2010 he complained of dysphagia, recurrent cough and dyspnoea. Cough was severe, especially after taking food. Gastroenterologist was consulted and upper Gastro-Intestinal (GI) endoscopy was done. UGI endoscopy on 19 August 2010 showed an Esophageal growth starting at 16 cm from Upper Esophageal Sphincter (UES) and extending up to 23 cm with TOF. A 10-cm covered Ultraflex stent was placed from 15–25 cm. He got relief from dysphagia but cough and dyspnoea remained.

His X-ray chest was clear and the esophageal stent was seen in place. Bronchoscopy was advised and done as per American Association for Respiratory Care (AARC) criteria.^[7] There was a huge gap in the posterior wall of the trachea with esophageal stent visible and protruding into the trachea and narrowing the lumen [Figure 1]. As the patient was severely symptomatic and the situation could have progressed to complete obstruction of the trachea, tracheal stenting was done on 31 August 2010. Guide wire (Zebra) was passed through the working channel of the bronchoscope and bronchoscope was withdrawn keeping the guide wire in trachea. A 10-cm covered Ultraflex tracheal stent [Figure 2] was passed over the guide wire and was deployed in proper position [Figure 3] covering the TOF. The whole procedure was done under vision by keeping the bronchoscope inserted through the left nares. Patient became comfortable and got relief from dyspnoea and cough. He was discharged after two days on 2 September 2010 and is doing well four months after the procedure. The patient is under follow-up of the oncologist for the primary problem. Check bronchoscopy was performed four months after the tracheal stent placement and there was no migration or any other complication of the stent, except that the tracheal lumen had slightly narrowed down from the posterior side.

DISCUSSION

Airways' stents have been in use for almost 90 years. Today they are indicated for re-establishing patency of compressed or strictured central airways, supporting weakened cartilages or sealing of fistulas. Stents are divided into four groups^[8]:

- i. Polymer stents such as Dumon stents,
- ii. Metallic stents such as Palmz stents or uncovered wall stents,
- iii. Covered metallic stents such as the covered Ultraflex stent,
- iv. Hybrid stents such as dynamic stents.

Airway and/or esophageal stent insertion provides an effective approach to improve the quality of life (QOL) in patients with malignant TOF. Stents can be placed

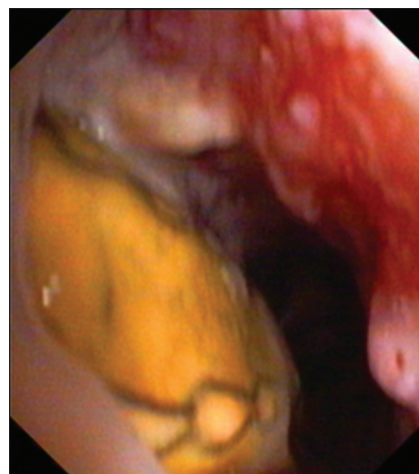


Figure 1: TOF with compressed trachea and visible esophageal stent



Figure 2: Stent over the guide wire

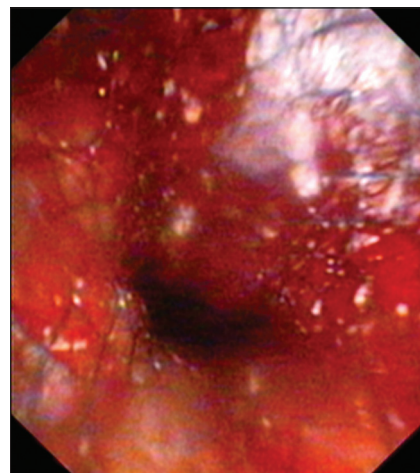


Figure 3: Deployed stent

bronchoscopically in the airways and with endoscope in the esophagus to seal the defect and restore the patency of passages with resumption of oral feeds.^[9] Although single tracheal or esophageal stents were successful in 91% of cases, 9% needed double stenting of both trachea as well

as esophagus.^[6] Our patient was in this category who did not remain symptom-free with esophageal stent alone and needed both esophageal and tracheal stents. Nowadays, in cases of severe esophageal and tracheal obstructions, the pulmonologists are involved early and recent reports suggest double stenting to be a promising option.^[10]

There is no doubt that double stenting is the gold standard and should be practiced but the present case was under care of the oncologist and as the predominant symptom was dysphagia he called upon the gastroenterologist who performed endoscopy and on finding TOF informed the oncologist. The oncologist explained the huge financial burden of double stenting (50,000 to 60,000 INR for each stent) and deferred the tracheal procedure. Anyhow, the tracheal stenting was done not too late (done within 10 days and during the same admission). The paper highlights and infers about the importance of this controversy.

TOF may occur secondary to radiation or chemotherapy, resulting in tumor dehiscence. This leads to frequent aspiration, the most frequent sign of TOF being coughing after swallowing; without prompt palliation, death occurs rapidly, with a mean survival time of between one and six weeks in patients who are treated with supportive care alone.^[11] Herth *et al.*,^[6] have reported a mean survival of 252.9 days with combined airway–esophageal stent. Our patient was successfully taking food and was not dyspnoeic four months after the stent placement.

Plastic- and silicone-cuffed stents were initially used in the management of TOF.^[12] However, up to 20% of silicone stents have been reported to migrate, with resultant reocclusion.^[13] Other problems of silicone stents include clinically significant stent obstruction with inspissated secretions due to impairment of mucociliary clearance, impedance of the cough reflex, lack of flexibility in the airway, high mucosal pressure and higher chance of bacterial colonization.^[14]

Initially, to deploy the silicon stent, patients were administered general anesthesia and the procedure was done with rigid bronchoscope under fluoroscopic guidance. Nowadays, these stringent requirements have been relegated to the past and large TOFs are successfully sealed by deployment of self-expandable stents through flexible bronchoscope without the need of fluoroscopy.^[15] The primary advantage of the expandable metallic stents is their easy delivery by means of flexible bronchoscope under topical anesthesia and their conformability to the airway anatomy due to their self-expanding characteristics.^[16] With the use of self-expandable metallic stents (SEMS), there is an increase in the QOL in patients with inoperable esophageal and lung tumors.^[5] We have used a covered SEMS which has an advantage over plastic or silicon stent not only in covering large defects, but also in having lower rates of migration along with adequate maintenance of patency of the passages.^[17]

Our patient had an increase in dyspnoea after placing the esophageal stent; a similar phenomenon has been reported by Nomori *et al.*,^[17] their two patients suffered from respiratory distress after placement of the esophageal stent because of compression of the trachea from the posterior wall. They have further observed that for patients with both esophageal and tracheobronchial stenoses, a stent should be introduced into the tracheobronchus first.

The success rate for closure of TOF using endoscopic methods varies from 87–100%.^[18,19] On repeat bronchoscopy, our patient was comfortable, his stent was placed at the right position and there were no complications. In the large series by Herth *et al.*,^[6] none of their patients developed stent migration or required repositioning of the stent and there were no complications of perforation or mediastinitis.

The American College of Chest Physicians guidelines for palliative care in patients with a malignant TOF recommend stent insertion in both the tracheobronchial tree and the esophagus for symptomatic relief.^[20]

To conclude, we report a case of CA esophagus post surgery who underwent chemotherapy and radiotherapy and later developed TO fistula. Initial placement of an esophageal stent did not give him much of a reprieve and later, tracheal stenting helped him to get complete relief from his disabling symptoms.

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