Case Report

Migrated esophageal stent posing a challenge for ventilation

ABSTRACT

Self-expandable esophageal stents are being commonly used for palliative treatment in advanced esophageal cancer patients to relieve dysphagia, prevent tracheoesophageal fistula, and facilitate symptomatic betterment. The modern covered stents reduce the ingrowth of the tumor but have seen an increase in the incidence of stent migrations. We report a rather complicated presentation of an esophageal stent for esophageal dilatation and a challenging management of a difficult tracheostomy.

Key words: Airway obstruction; migrated esophageal stent; tracheoesophageal fistula

Introduction

Esophageal stents are devices used in cases of esophageal stenosis or growth to prevent dysphagia and formation of tracheoesophageal fistula (TEF). Migration of these stents is a common complication but rarely do they migrate into the trachea revealing a large TEF. Respiratory distress in a patient with esophageal stents should be evaluated as a migration or a fistulous opening between the trachea and the esophagus.

Case Report

Our 40-year-old patient, a known case of carcinoma esophagus upper 1/3rd, presented for esophageal dilatation for the third time. He was diagnosed as a case of esophageal carcinoma 1 year ago had received three cycles of chemotherapy and 35 cycles of radiotherapy. Postradiotherapy patient developed esophageal stenosis for which esophageal stent was inserted 6 months later, and dilatation was done subsequently due to ingrowth. Percutaneous endoscopic gastrostomy (PEG) was also done at the same time. A restenosis at the upper end of the previous stent necessitated the second esophageal dilatation and the insertion of a longer and bigger stent 3 months later. The patient had history of cough on and off poststenting. After 1 month, the patient was taken up for the third dilatation. The patient was premedicated with injection glycopyrrolate and sedated with graduated doses of propofol and 50 mcg fentanyl. Nasal oxygen was provided at 4 L/min with nasal prongs. Postcricoid, a guide wire was inserted and dilated gradually with bougies large enough to pass the gastroscope. The esophageal stent was visualized, and ingrowth was observed. The patient had cough during the procedure and developed respiratory distress for which endotracheal tube was inserted under vision through the vocal cords. Subglottic minimal resistance was encountered, but the chest expansion was equal and clear on auscultation. Arterial blood gas was done which showed CO_2 retention for which a plan of elective ventilation was made. On detailed history, the patient had distressing apneic episodes and cough on and off causing a disturbed sleep in for 1 month, which he did not specify at admission. Analysis of history and presentation of the patient, a plan of elective tracheostomy

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was subsequently made. X-ray of the anteroposterior lateral chest showed endotracheal tube *in situ*.

The patient was taken up for tracheostomy, and before the incision on the anterior tracheal wall, the endotracheal tube was withdrawn under vision to position the cuff just subglottic. The tracheostomy tube created a false passage on two occasions, so the endotracheal tube was further pushed down to evaluate the reason for nonnegotiation of the tracheostomy tube. This was despite aspirating air in saline filled syringe before incision on the trachea. During the procedure, there was a sudden increase in airway pressure on the ventilator. On bagging the patient, the resistance was confirmed, and we were unable to ventilate. Stomach distention was also noted which was relieved by opening the PEG tube. A suspicion of TEF was made. On auscultation, conducted sounds were noted in the chest, and fiber-optic scope was used to aid the tracheostomy. On inserting fiber-optic scope through the endotracheal tube, esophageal stent was visualized. This indicated migration of esophageal stent in the trachea revealing large TEF.

The procedure was temporarily abandoned, and the patient on spontaneous ventilation was maintaining saturation between 92% and 97%. Computed tomography imaging was done to verify the placement of endotracheal tube with respect to the stent and to gauge dimensions of TEF [Figures 1-3].

Subsequently, the patient was taken up for tracheostomy after planning, and balloon dilatation was done between anterior tracheal wall and outer lumen of esophageal stent over a guide wire as there was very limited space. Initially, the endotracheal tube was withdrawn till the upper end of metallic stent, and the fiber-optic bronchoscope was inserted between anterior wall of the trachea and stent. A guide wire was inserted through fiber-optic scope, and balloon dilatation was done to increase space for tracheostomy tube. Later, the same endotracheal tube which was withdrawn was further pushed over fiber-optic scope after dilatation. Then, through the previous done tracheal stoma, a long length tracheostomy tube was inserted after withdrawing endotracheal tube guardedly. The patient was not taken up for surgery noting the advanced esophageal cancer in proximity of the TEF.

Our case was one such case which was diagnosed when posted for tracheostomy. Prior suspicion of a TEF was not thought of as the dilatation was performed, and on laryngoscopy, the vocal cords were well visualized. Previously, a migration of the stent in the hypopharynx has been reported which was diagnosed on laryngoscopy.

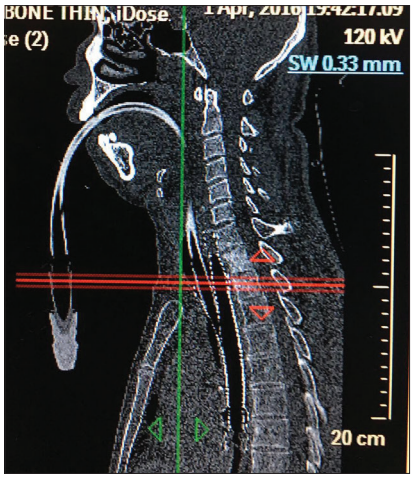

Figure 1: Endotracheal tube between the two esophageal stents

Figure 2: Endotracheal tube between the two esophageal stents prolapsed in the trachea

Figure 3: Cross section

A high degree of suspicion made us do a check fiber-optic bronchoscopy when the tracheostomy tube made a false passage. To our surprise, the esophageal stent was visible

through the endotracheal tube suggesting an almost entire migration of the esophageal stent through the posterior wall of trachea, literally eroding it. A multidisciplinary approach involving the gastroenterologist, interventional pulmonologist, and anesthesiologists evaluated the patient. Dexmedetomidine infusion of 0.5 mcg/kg was administered to the patient over 10 min. The flexible bronchoscope was inserted through the endotracheal tube and was withdrawn till the glottic opening. A wire balloon dilator through the fiber-optic scope was inserted between the anterior tracheal wall and the anterior wall of the upper esophageal stent, and space was created by serial dilatation. A long length tracheostomy tube was inserted through the neck in the space, and the patient was adequately ventilated without resistance.

Discussion

Patients with advanced esophageal cancer are provided palliation by insertion of esophageal stents to relieve dysphagia in nonresectable lesions. Stent positioning in the esophagus can help in the treatment of perforations, fistulas, provides palliation for dysphagia.[1] Esophageal stents come with early (32% within 2–4 weeks) or delayed complications (53%–65% cases after 1–2 months).[2,3] Early complications include bleeding, fever, chest pain (12%–14%), gastroesophageal reflux disease, globus sensation, perforation, and stent migration.[4] Delayed complications reported are tumor ingrowth, stent migration, stent occlusion, development of esophageal fistulae, and recurrence of stricture.[4] Stent migration is the most common among the early and delayed complications with an incidence ranging from 7% to 75%.[5]

Esophageal dilatation also involves risk of intra-procedure conscious sedation, aspiration, sudden bradycardias, and esophageal perforations. Retrospective analysis of the symptomatology and presentation of the patient, the worsening cough may have caused proximal stent migration of the self-expandable metal stent (SEMS), or even the stent malposition may have primarily been the causative factor for this cough. Patients will esophageal stents often have cough which is ignored and considered a usual feature. Migration into the gastrointestinal tract is common whereas into the airway causing respiratory distress is rare. Few cases have been reported on TEF causing esophageal stent migration into the trachea, hypopharynx. Posterior wall of the tracheal lacks cartilage and is membranous causing a propensity to perforate. Maintaining the airway by spontaneous ventilation in an awake or sedated patient would help avoiding the collapse of the airway by usage of skeletal muscle relaxants causing ventilating problems.

Hendra and Saukkonen reported a case of erosion of the right mainstem bronchus by an esophageal stent. Several factors contribute to SEMS complications: Pressure necrosis caused by stent itself, inflammation, fibrosis of esophageal mucosa (experimented in pigs), and radiation therapy. These severe airway obstructions have limited options. SEMS complications are sorted endoscopically or by giving symptomatic treatment. TEF was prevented by the second stent placed inside first.[6]

Konstantinos *et al*. reported a similar direct erosion and prolapse of esophageal stents in the tracheobronchial tree causing life-threatening airway compromise. SEMS has been involved in the late erosion of the trachea, bronchus, aorta, carotid artery, and also vertebral artery.[7]

Bronchoscopy helped in revealing a migrated esophageal stent exposed through the TEF.[8] Whereas Sloan *et al*. noted an esophageal stent migration into the hypopharynx that entirely obstructed the glottic opening.[9]

Conti *et al*. noted that chemotherapy and radiotherapy have increased the rate of complications and mortality after stent insertion. They reported managing the wide TEF with a serratus muscle mobilized to cover the posterior trachea to which a split-thickness graft was sutured to form the endobronchial lining.[10]

Madan *et al*. reported using a tracheal SEMS to successfully cover tracheal erosion caused by an esophageal stent. Any stent placed in the aerodigestive tract may result in local inflammation and mucosal necrosis which cause the walls of the tract to perforate, especially in situations of the local presence of tumor or following radiation (Hendra *et al*.). The stent has bulbous ends which supposedly help anchor the stent to the wall by themselves and result to increased pressure stress at the stent ends (especially the proximal end in case of esophageal [SEMS] increasing the chances of perforation.[11]

Ko *et al*. reported stent migration of 7.9% of which proximal migrations are only 27%. This case highlights an unusual cause of respiratory distress that needs to be thought of in patients with esophageal stents. Differentials of esophageal stent erosion and migration into the trachea have to be investigated especially when patient presents with cough, difficulty in breathing, tachypnea, and inability to sleep at night cause of repeated coughing bouts.[12]

In our instance, the migrated stent posed problems in ventilating, causing raised airway pressures and unusually

got lodged between the two esophageal stents causing challenges in tracheostomy. A long tracheostomy tube aided the temporary solution as patient and relatives refuse any major intervention. Cough, symptoms of choking, and respiratory distress in patients of esophageal stents are to be cautiously evaluated for stent migration.

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Conflicts of interest

There are no conflicts of interest.

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