

Tracheal stenting under flexible bronchoscopy for large tracheoesophageal malignant lymphadenopathy

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ABSTRACT

A 67-year-old man with poorly controlled chronic obstructive pulmonary disease presented with progressive dysphagia and was diagnosed with locally advanced carcinoma of the esophagus. Positron emission tomography-computed tomography staging showed mediastinal lymphadenopathy including a large lymph node in the tracheoesophageal groove with moderate tracheal compression. He was advised chemoradiotherapy but was reluctant to proceed with the same. He developed stridor 2 months later and repeat imaging showed increased size of the tracheoesophageal lymph node with critical airway narrowing. Since he was not fit for general anesthesia, he was subjected to tracheal stenting with self-expandable metal stent under flexible bronchoscopy. Following stent placement, there was relief of dyspnea, and stridor and the patient was discharged.

KEY WORDS: Airway stenting, esophageal carcinoma, flexible bronchoscopy

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INTRODUCTION

Central airway obstruction is a medical emergency and is usually managed by emergent intubation, tracheostomy, or bronchoscopy-assisted interventions to alleviate the obstruction. The purpose of all the above techniques is the same - to secure airway patency as quickly as possible. Airway stents have a role in such patients, especially in malignant extrinsic airway compression. With critical airway narrowing, rigid bronchoscopy scores over flexible bronchoscopy in performing airway stenting by enabling the operator to secure the airway throughout the procedure. However, some patients may not be clinically fit to undergo rigid bronchoscopy under general anesthesia (GA). In that case, airway stenting can be performed by flexible bronchoscopy. This will be easily possible, especially when the indications for airway stenting are tracheoesophageal

or bronchoesophageal fistulas, noncritical airway stenosis, and endobronchial malignancies. However, when the airway is severely compromised, performing airway stenting via flexible bronchoscopy will be met with technical difficulties including negotiating the flexible scope and the stent deployer beyond the narrowed airway segment. Herewith, we discuss a case in which a straight tracheal stent was placed with flexible bronchoscopy to restore airway patency in a patient with esophageal malignancy and mediastinal lymphadenopathy.

CASE REPORT

A 67-year-old man presented with progressive loss of appetite and dysphagia to solid food, along with increasing

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was critical tracheal narrowing, it would be risky to stent first the esophagus as this may further narrow the tracheal lumen during the procedure. Hence, it was decided to stent the trachea first. Furthermore, he was unfit for GA, in view of underlying severe emphysema and poor general condition. Thus, the tracheal stenting procedure was planned under flexible bronchoscopy with local lignocaine topical anesthesia. A complete coronal CT restructuring of the trachea was obtained before the procedure.

Since the narrowest AP diameter was 4 mm, we performed bronchoscopy via a pediatric bronchoscope (BF-3C40, outer diameter 3.3 mm) via the oral route. Both vocal cords were observed to be abducted. On crossing the vocal cords, extrinsic compression over the posterior tracheal wall was seen, starting 2 cm below the vocal cords and extended up to 3 cm above the carina. The length of the narrowed segment was around 6.5 cm and mucosa was normal. The carina was widened. Minimal extrinsic narrowing of the left main bronchus was seen; however, the mucosa was normal. The right bronchial tree was normal. As the narrowing of the upper trachea could not be covered by a tracheobronchial Y stent (the longest tracheal arm available is 6 cm) and also there was no significant narrowing of the left main bronchus, it was decided to deploy a straight tracheal stent.

A guidewire was passed through the working channel of the 3.3 mm scope and the tip of the guidewire was confirmed to be at the carina. Then, the 3.3 mm scope was withdrawn and the adult bronchoscope (BF-1T60, outer diameter, OD is 5.9 mm) was inserted. With difficulty, it was negotiated beyond the narrowed tracheal segment. The scope was then withdrawn, and with the distal tip just above the proximal end of the tracheal narrowing, transbronchial needle aspiration (TBNA) was attempted from the upper retrotracheal node using 21-gauge single-use TBNA needle (Olympus ViziShot). Suction was applied after the needle was passed. Two passes were attempted; very little material was aspirated. On withdrawing the TBNA needle, there was bleeding which was controlled by applying the tip of the scope over the puncture site. All clots were suctioned off. The 5.9 mm scope was then withdrawn. The deployer (outer diameter 8 mm) was railroaded via the guidewire through the vocal cords. The 3.3 mm scope was also passed in parallel following the deployer. However, the deployer could not be negotiated through the narrowed tracheal segment as it was seen bending when the operator used pressure to pass through the narrowed segment [Figure 4]. The 3.3 mm scope was kept close to the deployer to give a sturdy support to the more flexible and less sturdy deployer and together, both were pushed. Again, the deployer could not be negotiated through. The 3.3 mm scope was withdrawn, and the 5.9 mm scope was passed, and negotiated with difficulty beyond the narrowed segment. The deployer was then pushed firmly keeping it as close to the scope as possible as the latter has already provided leverage through the narrowed segment. With difficulty, the deployer passed through

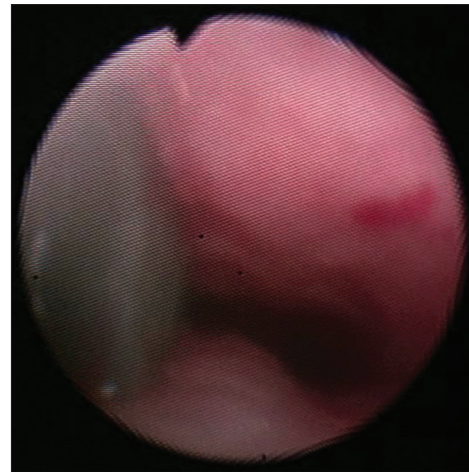


Figure 4: Bronchoscopy showing inability of the deployer to negotiate the narrowed segment

the narrowed segment. Bleeding started to arise from the posterior tracheal wall following the mucosal trauma. The distal end of the deployer was kept 2 cm above the carina and checked with direct vision via the 5.9 mm scope. The scope was withdrawn, and the stent (covered self-expandable metal stent [SEMS] OD 16 mm, length 8 cm) was then deployed. Stridor was immediately relieved. Following which, a check bronchoscopy was performed and luminal patency was confirmed and the bleeding was tamponaded by the expanded stent. In addition, the vocal cords were now observed to be adducting normally. A chest X-ray postprocedure showed the stent *in situ* [Figure 5]. Thirty-six hours following stent deployment, the patient noticed that there was new onset increasing difficulty in swallowing semisolid food. The patient was discharged 2 days after the procedure and was referred to a radiotherapy referral center for irradiation therapy. On telephonic follow-up, it was noted that his swallowing difficulty had improved following five cycles of radiotherapy.

DISCUSSION

Esophageal carcinoma is the eighth most common cancer and the sixth most common cause of cancer death worldwide.^[1] The overall 5-year survival rate is <20%.^[2] A majority of patients present with locally advanced disease (T3 or T4, with nodal or N positivity). The extensive submucosal lymphatic network of the esophagus allows early regional lymph node metastases from esophageal cancer by longitudinal spread along the esophageal wall.^[3] Management of these patients has shifted from a primary surgical resection to a multimodality approach consisting of either neoadjuvant sequential chemoradiotherapy followed by resection or definitive chemoradiotherapy alone in patients not fit for surgery.^[4] Esophageal SEMS has a role in palliative care with a good safety profile in these patients. Indications include for palliation of dysphagia and tracheoesophageal or bronchoesophageal fistulas.^[5]



Figure 5: Chest X-ray showing tracheal self-expandable metal stent *in situ*

Straight tracheal or tracheobronchial Y stents have a role in patients with esophageal cancer; indications include fistulas, tracheal stenosis, and complications related to esophageal stents.^[6,7] The airway stents are placed via either rigid or flexible bronchoscopy. If both esophageal and airway stents are required, the airway stent is usually placed after the esophageal stent placement. However, both can be placed together as well.^[8]

In our patient with esophageal malignancy, the stridor and central airway narrowing was not due to the primary esophageal growth *per se*, but was due to a large metastatic lymph node located in the tracheoesophageal groove well above the esophageal growth. In our review of literature, we found only one case report from Japan with a similar presentation.^[9] Since the narrowest AP diameter was 4 mm, passing the adult bronchoscope with OD 5.9 mm and the stent deployer with OD 8 mm would likely be met with difficulty. Furthermore, any bleeding if were to occur during the procedure may lead to blood clots obstructing the already compromised airway. Ideally, this procedure should have been done with the aid of a rigid bronchoscope under GA so that the airway is secured. However, due to comorbid illness, he was not fit for GA. Furthermore, since the extrinsic tracheal narrowing was arising from behind the posterior wall of the trachea which is devoid of cartilage, we believed that we might be able to negotiate the deployer. We assumed that the muscular posterior wall would give way for the deployer as it is advanced.

We first assessed the tracheobronchial tree with the 3.3 mm scope to ensure there was no other pathology in the distal bronchial tree. We then proceeded to pass a guidewire through its working channel. The purpose of the guidewire was not only to assist in passing the deployer but also to enable emergency intubation, in case there is bleeding or airway compromise during the procedure. Next, before attempting to pass the deployer, we tried to negotiate the narrowed segment with the 5.9 mm scope to give us an idea of how much the posterior tracheal wall will give way.

This was passed with difficulty, giving us an intuition that passing the deployer will be difficult after all. Hence, we thought we could try and perform a therapeutic TBNA of the necrotic node in the tracheoesophageal groove. This might decrease the node size and give us more leeway for passing the deployer through. However, this was met with failure, as only scanty material was aspirated (cytology of which showed cellular atypia), and the node could not be decompressed. Hence, we decided to go ahead and attempt to pass the deployer but we met with resistance. As the deployer was having a curved and less rigid framework, it started to bend on meeting with resistance rather than passing through the narrowed segment. This was eventually overcome by negotiating the 5.9 mm scope and then passing the deployer close to the scope taking advantage of the increased AP diameter generated by a more rigid structural framework of the scope and thus acting like a dilator. At this point, with both the 5.9 mm scope and 8 mm deployer *in situ*, traumatic mucosal bleeding occurred. However, with the deployment of the stent, the bleeding was controlled. One interesting thing that we noticed was the behavior of the vocal cords. The patient had presented with hoarseness of voice and we noticed both vocal cords to be abducted at the start of the procedure. However, after the stent was placed, both vocal cords were functioning normally. Apparently, with critical airway narrowing, the patient voluntarily kept his vocal cords abducted and chose not to speak as he was “busy” trying to breathe. The moment the stent was deployed, his dyspnea was relieved and he was comfortable enough to speak.

CONCLUSION

We believe this case report is unique in many ways: Tracheal stenting done with the aid of a pediatric scope, indication for stenting being a large tracheoesophageal metastatic node proximal to the primary malignancy, performing airway stenting using flexible bronchoscopy in the presence of critical airway narrowing, and using the flexible scope’s sturdy frame to provide leeway for the deployer to pass through the narrowed segment. Furthermore, though the node appears to have internal areas of hypoattenuation in the CT, TBNA failed to decompress the node. We are unsure if endobronchial ultrasound might have helped here as we do not have the facility in our center.

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Conflicts of interest

There are no conflicts of interest.

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