

# Anaesthetic Management of Tracheal Stenosis Posted for Resection and Reanastomosis: A Case Report

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## Abstract

A 38 years old male patient diagnosed with tracheal stenosis was posted for resection and anastomosis of the stenotic part. Keeping cardiothoracic surgeon on standby with femoral vessels ready for emergency bypass, awake fiberoptic intubation was done with cuffed flexometallic tube. After making a nick in the stenotic part by the surgeon, cuffed flexometallic tube of ID 4.5 mm was inserted in the distal part and further ventilation continued with that tube while leaving oroendotracheal tube in situ. At the end of surgery the surgeon had difficulty placing sutures around the large tube so ETT of smaller ID of 5mm was inserted after removing the previous ETT of ID 7.5 mm. Once the anastomosis was over, the tube was removed from the distal part of trachea and ventilation was continued from the oroendotracheal tube placed at the start of the procedure. The patient maintained well throughout the procedure. The patient was extubated uneventfully.

**Keywords:** Tracheal Stenosis, Tracheal Resection and Anastomosis, Anaesthetic Management.

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## Introduction

Tracheal stenosis (TS) is rare but a life-threatening condition caused by postintubation injury, trauma, congenital problems and tracheal compression by tumor.<sup>[1]</sup> Symptoms usually appear between one and three months postextubation and includes exertional dyspnea followed by dyspnea at rest.<sup>[2]</sup> Tracheal resection and reconstruction (TRR) is the treatment of choice for most of these patients.<sup>[3]</sup> Postintubation tracheal stenosis due to cuff of the ETT or tracheostomy tube can occur even after a short period of intubation. This occurs due to injury to the tracheal mucosa which leads to chronic inflammation and hence granuloma formation.

The length of adult trachea is 10-11 cm out of which approximately  $1/3^{rd}$  is extrathoracic and  $2/3^{rd}$  is intrathoracic. But this length varies with position of the neck (flexion/extension) and respiration. So usually in post-operative period after reconstruction, the chin of the patient is fixed towards chest using a suture which maintains the neck in flexion. The patient should be pre informed about this to reduce his apprehension.

## Case Report

A 38 years old male patient diagnosed with tracheal stenosis was posted for resection and anastomosis of the stenotic

part. The patient had history of organophosphorus compound consumption two months back following which he was intubated and was on ventilator for a total duration of 14 days. Patient developed complaints of noisy breathing and dyspnea. CT neck and chest revealed circumferential narrowing of tracheal lumen suggestive of tracheal stenosis for a length of 13 mm approximately 3.4 cm proximal to tracheal bifurcation. HRCT imaging revealed mild mural thickening and short segment (approximately two cm) severe (approx 80%) luminal narrowing of trachea at the level of D1-D2 to the D3 vertebral level. All routine blood investigations were within normal limits. The patient was explained well about fiberoptic intubation and the risks involved due to difficult airway and surgery. The patient was explained that post extubation his chin will be tied via a thread to his chest. He was premedicated with Tab. Ranitidine 150 mg the night before and the morning of surgery. On the morning of surgery, difficult airway kit was made ready. All routine vital monitors were attached (HR, SpO<sub>2</sub>, NIBP, ECG, EtCo). Intravenous line secured in left hand with 18 G cannula and ringer lactated connected. Left femoral arterial and venous lines were inserted under all aseptic precautions under local anaesthesia. Patient was nebulised with two percent lignocaine and gargling done with four percent viscous lignocaine gel. Injection glycopyrrolate 0.2 mg given intravenously. Under all aseptic precautions

bilateral superior laryngeal nerve blocks were given with two percent lignocaine, 1.5 ml on each side. Patient was preoxygenated with 100% oxygen. Meanwhile CTVS surgeon prepared the right femoral vessels for emergency bypass under local anaesthesia in case of loss of airway, bypass machine was kept ready [Figure 1]. Awake fiberoptic intubation was done using spray as you go technique with cuffed flexometallic tube of internal diameter 5 mm [Figure 2]. Patient was oxygenated through drug/suction port throughout the procedure till the airway was secured. Tube could not be negotiated beyond the constricted part although we were able to ventilate the patient. Injection fentanyl 50 microgram and Inj. propofol 100 mg iv was given. Ventilation and chances of airway collapsibility were checked by Injection succinylcholine. Injection atracurium 25 mg was given after conformation of ventilation. Anaesthesia maintained with inhalational N<sub>2</sub>O and sevoflurane. Patient was positioned with neck extended by placing a roll under the shoulders and a head ring to stabilize the head. After making a nick in the stenotic part, cuffed flexometallic tube of ID 4.5 mm was inserted in the distal part by the surgeon and further ventilation continued with that tube while leaving oroendotracheal tube in situ. The tube of larger internal diameter of 7.5 mm was inserted once the incision was made. At the end of surgery the surgeon had difficulty placing sutures around the large tube so ETT of smaller ID of 5mm was inserted after removing the previous ETT of ID 7.5 mm. Once the anastomosis was over, the tube was removed from the distal part of trachea and ventilation was continued from the oroendotracheal tube placed at the start of the procedure. The patient maintained well throughout the procedure. The patient was extubated uneventfully.

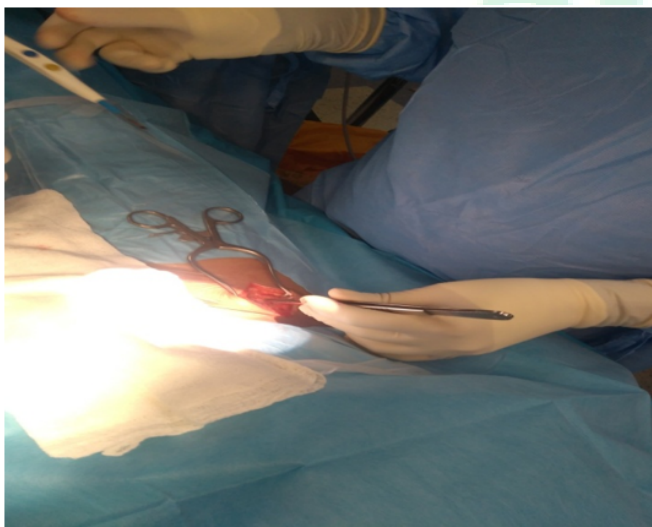


Figure 1: Right femoral vessels for emergency bypass



Figure 2: Fiberoptic intubation with oxygen connected to drug port

### Case Discussion

In our patient HRCT showed 80% luminal narrowing which corresponds to approx four mm diameter, thus explaining the signs and symptoms in him. We considered various airway management strategies-

1. Use of supraglottic airway device (SGAD) alone while maintaining spontaneous respiration.
2. Use of supraglottic airway device (SGAD) while maintaining spontaneous respiration in patient. Then assessment of narrowed segment using fibreoptic bronchoscope (FOB) through supraglottic device and intubating the patient through SGAD by railroading the endotracheal tube (ETT) over FOB.
3. Awake fiberoptic bronchoscopy using berman's airway via oral route and giving titrated doses of opioids and propofol to avoid risk of cough and losing the airway.
4. Use of SGAD and Airway exchange catheter which could be used as a guide to rail road ETT of appropriate size through SGAD.

Isono et al used SGAD alone for managing a case of tracheal stenosis posted for thoracolumbar laminectomy and fixation for burst fracture of first lumbar vertebra in prone position.<sup>[1]</sup> General anaesthesia was induced using i.v. remifentanyl, propofol, vecuronium and Proseal LMA was inserted using gum elastic bougie. The patient was ventilated using pressure controlled mode. However in our patient we did not choose this method because of the risk of air trapping beyond the stenotic part and also the possibility of device getting dislodged or

airway obstruction at the stenotic part due to tracheomalacia on using muscle relaxant.

The supraglottic device as a conduit for intubation as suggested by Asai was not used because of risk of tube getting misplaced while removing the supraglottic device.<sup>[1]</sup>

Hobai et al also suggested using direct laryngoscopy and intubating the trachea using small ETT with a stylet.<sup>[2]</sup> Use of stylet provides stiffness although FOB does not offer this advantage but it has the advantage of visual inspection of the stenotic part just before intubation.

So we decided to go ahead with the safest method available by awake fiberoptic bronchoscopy using berman's airway via oral route and give titrated doses of opioids and propofol to avoid risk of cough and losing the airway. Adequate airway preparation was done prior to fibreoptic intubation and once the airway was secured with ETT with patient breathing spontaneously, succinylcholine was given to assess the collapsibility of the airway. In case we lost the airway, backup plan of cardiopulmonary bypass was kept ready as CTVS surgeon prepared the right femoral vessels for emergency bypass under local anaesthesia.

## Conclusion

To conclude, we discussed anesthetic management of a patient with tracheal stenosis and the possible airway management strategies available with us. The feasibility and success of airway strategies vary greatly and therefore, airway management must always be optimised according to the

patient's requirement.

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