

Tracheal Tumour Resection – Anaesthesia Management

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Abstract

Primary tracheal tumours are the second most frequent cause of tracheal stenosis in adults. Patients generally present with slowly progressive symptoms of airway obstruction.

We present a case of a patient with a tumour involving the lower end of the trachea extending into the right bronchus.

One lung ventilation during resection was maintained by selective left bronchus intubation under vision, using a separate circuit. All haemodynamic and ventilatory parameters remained normal during the period of one lung ventilation and the patient was extubated on table.

Case Report

51-year-old male weighing 58 kg. presented with progressively increasing dyspnoea since two months with cough and expectoration.

Patient was diagnosed with carcinoid tumor of the right lower trachea and was advised resection. Within a week he was posted for surgical resection.

On preoperative evaluation the patient appeared comfortable at rest. On auscultation there were no foreign sounds and air entry was bilaterally equal. Examination of other systems revealed no abnormality. All routine investigations including X-ray chest and baseline ABG were within normal limits.

MRI of the thorax revealed a 2.7x 2x 1.9 cm soft tissue mass lesion in the distal aspect of trachea extending into the carina and the origin of the right main bronchus. Preoperative pulmonary function test revealed a prebronchodilator FVC 37.6% of the predicted and FEV₁/FVC 76% of the predicted. The MVV was only 15% of the predicted, which was expected to improve subsequently as patient had history of intubation 1-week prior.

The patient was wheeled into the OT and after attaching the cardioscope and pulse oximeter, left radial artery was cannulated under local anaesthesia.

Before induction thoracic epidural catheter No. 16 was inserted in T10-T11 space for perioperative analgesia. Right internal jugular vein was also cannulated.

After adequate preoxygenation, anaesthesia was induced with oxygen –sevoflurane mixture and mask ventilation was confirmed. After the patient could be ventilated Inj. Succinylcholine 75 mg was given to facilitate intubation. Patient was intubated with No. 9 Portex cuffed endotracheal tube orally without any difficulty. After confirming bilateral air entry a long acting muscle relaxant was given. Sedation and analgesia were maintained using Inj. Midazolam and Inj. Fentanyl. An additional dose of Fentanyl 50 mcg diluted in 10 ml of normal saline was given epidurally before the incision.

Anaesthesia was maintained using O₂: N₂O mixture along with intermittent Sevoflurane and Propofol infusion @ 4-6 mg/kg/hr. Muscle relaxation was maintained using intermittent bolus doses of Inj. Vecuronium.

Femorofemoral bypass was kept ready to maintain oxygenation in case there was a catastrophe and it was not possible to ventilate the patient. Surgical approach was through a right thoracotomy incision and a tracheal sleeve resection was done. Initially ventilation was maintained bilaterally through the orotracheal tube. During sleeve resection of the trachea (along with part of the right bronchus), the surgeon inserted a sterile 32 number flexometallic tube into the left bronchus and ventilation to the left

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lung was continued using a sterile circuit attached to the Servo ventilator. One lung ventilation was maintained

The period between the tracheal resection and the insertion of the endobronchial tube was less than 3 minutes, during which time jet ventilation was used to maintain ventilation. However all haemodynamic parameters including the O₂ saturation and the ETCO₂ were maintained during this interval. One lung ventilation was carried out for a period of 30 mins during which all the parameters remained stable. Peak airway pressure never went beyond 20 cms H₂O.

As the anastomosis was completed, there was again an air leak for about 3-4 mins from the time the endobronchial tube was removed and the anastomosis was completed. During this period jet ventilation was used to maintain ventilation. The ventilation was again continued bilaterally using the orotracheal tube. However gentle ventilation with lower tidal volume and a higher respiratory rate was done to avoid any pressure on the suture lines.

For the same reason it was decided to extubate the patient on table and avoid positive pressure ventilation. Intraoperative blood gases were within normal limits. Anaesthesia was reversed and patient was extubated on table. All vital parameters were well maintained during this period. Patient was shifted to ICU for observation. Supplement oxygen was given via a Hudson mask for the next 24 hours. Patient was shifted out of the ICU on the third postoperative day.

Discussion

Tracheal resection is indicated, if technically feasible in patient who has tracheal obstruction caused by prior tracheal trauma, primary tracheal tumours (the majority of which are carcinomas), congenital anomalies and vascular lesions. Tumours are the second most frequent causes of tracheal obstruction.

Unlike obstructions of the upper airway, which may be bypassed by intubation or tracheostomy, lesions of the distal trachea present grave problems in patient management. The possibility of rapid cardiorespiratory decompensation is ever present and should be taken into consideration when planning management of

the problem.

Primary mediastinal tumours are diagnosed late, as they are not readily apparent on X-ray and in many cases the slowly progressive signs of upper airway obstruction are misdiagnosed as asthma or chronic bronchitis.¹

Airway must be narrowed to 5-6 mm on X ray before signs and symptoms of airway obstruction begin to appear. Of the patients who have operable lesion, approximately 80% have a segmental resection with primary anastomosis.

In our case there was a soft tissue mass (2.7 x 2 x 1.7 cm) in the distal aspect of trachea extending into the carina and the origin of the right main bronchus. Unless airway obstruction is imminent, pulmonary function should routinely be studied preoperatively. The presence of preoperative lung disease that is severe enough to warrant postoperative ventilatory support is a relative contraindication to tracheal resection. The trauma of positive airway pressure and an endotracheal tube cuff at the tracheal suture line may cause wound dehiscence.¹ History of position dependent airway obstruction is important because the induction of Anaesthesia should be accomplished with such patients in a position that does not cause airway obstruction.

Many surgical teams perform difficult tracheal resections with cardiopulmonary bypass team standing by; the risk of intrapulmonary haemorrhage due to heparinization precludes its routine use.²

A variety of methods for providing adequate oxygenation and carbon dioxide elimination have been used during tracheal resection including standard orotracheal intubation, insertion of a tube into the opened trachea distal to the area of resection,³ HFJV through the stenotic area,⁴ HFPPV and

cardiopulmonary bypass.

In our case the left main stem bronchus was intubated through the operative field and ventilation and Anaesthesia were carried out entirely via the left lung while the diseased segment was resected.

Although it is theoretically possible to temporarily eliminate the perfusion to the right lung with pulmonary artery clamping, this is often technically difficult and entails the hazard of injury to the right pulmonary artery. In our case one lung ventilation was carried on for 30 minutes during which all the ventilatory and haemodynamic parameters remained stable.

Many previous technical limitations to the performance of tracheal surgery can now be overcome by careful preoperative delineation of the site and degree of obstruction, close

intraoperative communication between the surgeon and anaesthesiologist, improved anaesthetic management techniques and meticulous postoperative care. All of these components contribute to the ability to provide adequate ventilation in the perioperative period.

References

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HAZARDOUS ALCOHOL DRINKING IN RUSSIA

'Our analyses provide indirect support for the contention that the sharp fluctuations seen in Russian mortality in the early 1990s could be related to hazardous drinking as indicated by consumption of non-beverage alcohol'

Mortality rates in Russia have fluctuated greatly over the past 20 years, with deaths obviously related to alcohol showing the greatest changes. David Leon and colleagues did a population based case-control study to investigate the contribution of alcohol, and hazardous drinking in particular, to male mortality in a typical Russian city. They found that mortality in working-age men was strongly associated with hazardous patterns of alcohol consumption. They identified drinking of non-beverage alcohols as a potentially major contributor to mortality. The investigators conclude that development of policy interventions to address this serious problem will need major shifts in how alcohol is perceived in Russian life. In a Comment, Jürgen Rehm and Gmel Gmel discuss the importance of this study and consider several aspects that need further assessment.

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