ORIGINAL RESEARCH PAPER
Volume-6 | Issue-12 | December-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 93.98
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ANAESTHETIC MANAGEMENT IN PATIENT OF TRACHEAL STENOSIS FOR TRACHEAL RECONSTRUCTION

Anaesthesiology

Kiranpreet Kaur D.A, DNB, Associate Professor, Department of Anaesthesiology and Critical Care, Pt. B. D. Sharma Pgims, Rohtak- 124001 Haryana, India

SK Singhal M.D., Senior Professor, Department of Anaesthesiology and Critical Care, Pt. B. D. Sharma Pgims, Rohtak- 124001 Haryana, India

Manisha Mittal* M.D., Senior Resident, Department of Anaesthesiology and Critical Care, Pt. B. D. Sharma Pgims, Rohtak- 124001 Haryana, India *Corresponding Author

Garima Vashisht M.D., Senior Resident, Department of Anaesthesiology and Critical Care, Pt. B. D. Sharma Pgims, Rohtak- 124001 Haryana, India

Priyanka Mishra Post Graduate Student, Department of Anaesthesiology and Critical Care, Pt. B. D. Sharma Pgims, Rohtak- 124001 Haryana, India

KEYWORDS

INTRODUCTION

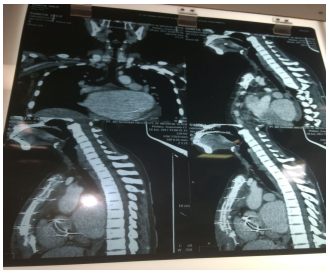
The incidence of severe tracheal stenosis (TS) with symptoms is seen in 1-2% of patients (1-3). The causes of adult tracheal stenosis include trauma, chronic inflammatory diseases, benign neoplasm, malignant neoplasm and collagen vascular diseases. The most common cause of tracheal stenosis continues to be trauma, which can be due to prolonged endotracheal intubation, tracheostomy blunt or penetrating neck trauma.[1-4]

The cuff-pressure of endotracheal tubes is one of the important factor for development of tracheal damage in intubated patients. High volume and low pressure cuff endotracheal tubes are used to minimize this injury. When the cuff pressure exceeds the mucosal capillary pressure (30 mm of Hg) of the trachea, the mucosa that lies between the cuff of the balloon and the underlying cartilages develops ischaemia. Long standing ischaemia can lead to ulceration and chondritis of tracheal cartilages, followed by fibrotic healing leading to progressive tracheal stenosis. [2,5]

Post-tracheostomy stenosis is a rare but serious complication that may be encountered in the emergency department (ED). Patients with severe TS may present with respiratory difficulty, requiring emergency intubation in the ED. Tracheal resection and reconstruction is one of the rare operation and challenge for anaesthetist.[6] We herein report a case of successful management of patient of tracheal stenosis undergoing tracheal resection.

CASE REPORT

A 28-year-old female was a follow-up case of mitral valve repair. She had stayed 25 days in the ICU with a tracheostomy. Her decannulation was done a week prior to her presentation to the ED. She presented with complaints of progressive difficulty in breathing and stridor. The patient had an air entry was present bilaterally with ronchi on both sides. On examination patient was tachypneic with respiratory rate of 28/minute, wheezing and using accessory muscles of respiration. SpO2 on room air was 88 % which worsened on lying down. Saturation improved on oxygen supplementation. Her vitals included heart rate of 96 beats per minute, blood pressure 130/80 mmHg and all other systemic examination was unremarkable.



CT Scan Of Patient Showing Tracheal Stenosis

A diagnosis of post-intubation tracheal stenosis was made provisionally. Urgent bronchoscopy was done and revealed severe tracheal stenosis at the level of fourth tracheal ring. Computed tomography (CT), revealed TS with tracheal lumen of diameter 4 mm, 1.5 cm proximal to the carina. The patient was shifted to the ICU and was posted for tracheal resection anastomosis the next day.

In the operating theatre, monitoring included NIBP, ECG, and pulse oximetry was attached. We planned to do a fiberoptic bronchoscopy (FOB) for intubation. The patient was given a superior and transtracheal nerve block and awake FOB intubation was tried. Despite several attempts, we were not able to negotiate the FOB through the constriction.

Therefore, we decided to proceed using direct laryngoscopy under sedation. Low dose propofol (20 mg) was administered and an endotracheal tube (ETT) with an internal diameter of 5.0 mm was tried. It could not be passed 2-3 cm beyond the vocal cords, size of ETT was reduced to 4.5 mm ID which was also a failure and finally patient was successfully intubated with 4.0 mm endotracheal tube. Patient was maintained on O2, N2O, Sevoflurane and fentanyl. We ventilated patient with low flows and then surgeons proceeded with resection and anastomosis of the trachea.

Trachea was dissected anteriorly and airway was opened. Flexometallic tube was inserted in distal airway and oral tube was pulled back. After near completion of anastomosis new oral tube of size 6:0 mm ID was taken. Rubber catheter was passed retrograde into pharynx and catheter was tied with suture on murphy eye of ETT. Rubber catheter was pulled by surgeon to advance ETT Tube distal to anastomotic line and was also confirmed by surgeon. Endotracheal tube from distal airway was removed. Rest of surgery was carried successfully.

After the completion of her surgery, the patient was shifted to the ICU for elective ventilation. She was kept sedated until the next morning with his neck flexed, and was extubated next day. The rest of the course of her treatment in the hospital was uneventful.

DISCUSSION

Tracheal stenosis (TS) following a tracheostomy commonly results from excess granulation tissue formation around the tracheal stoma site caused by abnormal wound healing. Fractured cartilage during the tracheostomy procedure can lead to excess granulation tissue.[2,5]

With a patient with post tracheostomy stricture (PTS), utmost care should be taken, as he or she may present with a full-thickness web as in our case. This patient will desaturate quickly, as it will be difficult to intubate and it will become subsequently difficult to oxygenate the patient The small constriction present through this full-thickness web could be the only channel through which the patient is breathing, and any attempt to take away spontaneous breathing is not advisable.[7]

Any patient with Post tracheostomy stenosis presenting with respiratory difficulty should be approached with caution in emergency department. Deep sedation should be avoided in such patients without adequate back up like fibre optic bronchoscope and preparation of emergency tracheostomy[6,2]

Tracheal reconstruction is one of the complex surgery encountered both by surgeon and anaesthetist as they both share common airway path. Its anaesthetic management should be properly planned. It is important to evaluate the cause and type of lesion. Such patients should be thoroughly pre-evaluated before formulating anaesthetic plan.[6]

Proper equipments should be kept ready for managing such complicated cases. One should be prepared with emergency airway cart. Fibreoptic bronchoscope both rigid and flexible, jet ventilator catheter, sterile circuits, sterile Y piece, flexometallic tube, emergency tracheostomy equipments, should be kept ready before inducing such patients. Several different sizes of endotracheal tubes must be available for use throughout the procedure.[3,6,2] Arrangement of double anaesthesia machines should be done. Second machine may be required during separate ventilation of both lungs at the time of carinal resection. You may land up in situation of inability to ventilate like situation, for such situation ECMO should be kept ready.[1,2,4,6] We made all the arrangements for our patient as stenotic lesion was just 1.5 cm above trachea and patient had severe distress in preoperative period.

Monitoring should be meticulous in these patients. Besides routine monitoring, arterial catheter should be kept in place. Arterial catheter is required for frequent sampling and also for urgent need if required to go on cardiopulmonary bypass.[4,6] Cardiopulmonary bypass under local anaesthesia through femoral route has been used in such operations.[2] We inserted both radial artery catheter and also femoral artery catheter in our patient and made all arrangements for cardiopulmonary by pass ready for use when required.

Beside the degree of stenosis, position of stenosis is also important for anaesthesia. For upper tracheal stenosis, a tracheal tube can be inserted below the stenotic area under local anaesthesia or cervical epidural block. For most severely obstructed patients with critical stenosis and at risk of complete respiratory failure at any time, conventional anaesthetic technique would be catastrophic as attempts at inserting a small ETT may cause complete obstruction of the airway. In these patients, the anatomy allows ventilation when breathing spontaneously.[5] We were successful in inserting small sized tube beyond the stenosis and were able to ventilate the patient but with resistance.

Alternative airway management in such patient can be use of supraglottic devices but severe airway obstruction may develop during inhalational induction which can worsen the situation.[1]

Use of a tube-exchange catheter can be another option.1 Gum elastic bougie followed by railroading of ETT over the bougie may minimize the risk of ETT malposition and tracheal damage. [2,8]

Analgesia can be provided by short acting opioids and by placing thoracic epidural catheter. Alternative mode of anaesthesia that can be used is propofol with remifentanil infusion. It had also produced good results.[6] In our patient we used optimal dose of fentanyl for providing analgesia.

These patients should be shifted to ICU for ventilatory support, which is necessary in postoperative period. The endotracheal tube must be positioned so that the cuff does not rest on any suture line. Good pulmonary toilet and serial blood gas monitoring is required in ICU[3,6] We extubated our patient after one day ventilatory support and rest postoperative period was unremarkable and patient was discharged seventh postoperative day after getting relived from her symptoms,

CONCLUSION

Due to the nature of stenosis it is not feasible to use standard ventilation techniques in a routine way. The proper method of a safe and efficient gas exchange establishing is the key to the successful management and we advocate that airway management of any PTS patient presenting with respiratory distress should always be approached with caution.

REFERENCES

1. Isono et al Case Scenario: perioperative airway management of a patient with tracheal stenosis Anesthesiology 2010; 112: 970-8
2. Anwar-ul-huda,Muhammad-Qamar-ul-Hoda,SohailAwan Emergency airway management of a patient with tracheal stenosis. J Pak Med Assoc 2010; 60: No. 9: 775-777
3. Chndrashekhar V., Patel R., Kishor S., Madhav S., Chaudhari L. Anaesthetic management for a case of traceotracheal reconstruction. The Internet Journal Of Anaesthesiology 2004; 10: No 1
4. Zhou et al . /J Zhejiang Univ Sci B Anesthetic management of a emergent critical tracheal stenosis 2007; 8(7): 522-525.
5. Ramaswamy A.H., Kurdi M.S., Shaikh I.S., Deva R.S., Syed Uwais Raza Awake rigid bronchoscopy for post intubation tracheal stenosis Anaesth Pain & Intensive Care 2014;18(3):299-301
6. Sandberg, Warren Anesthesia and airway management for tracheal resection and reconstruction. International Anesthesiology Clinics 2000; 38(1):55-75.
7. Yadav et al Airway Management of a Post Tracheostomy Stenosis Patient With Respiratory Difficulty: Make Sure You Have Fibre Optic Guidance Before Administering a Muscle Relaxant Trauma Mon. 2016 July; 21(3):e20927.
8. Juvekar N.M., Neema P. K., Manikandan S., Rathod R.C., Anesthetic management for tracheal dilatation and stenting Indian J. Anaesth. 2003; 47: 307-310