ANAESTHETIC MANAGEMENT IN T-TUBE REMOVAL IN A PATIENT WITH TRACHEAL STENOSIS

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ABSTRACT

The Montgomery T tube is a device which will be used as a combined tracheal stent and an airway after laryngotracheal surgery.The device is used mostly in specialized centres for head and neck surgery and therefore many anaesthetist may be unfamiliar with its use.

Removing the T tube is more complicated as inserting it as the airway might collapse and securing the airway will be impossible. The choice of airway maneuvers must be individualized depending on the severity of the stenosis and experience of the anaesthetic team

We have reported a case of 15yr old female o/c/o tracheal stenosis due to prolonged intubation with tracheostomy and T-tube insitu came for T-tube removal with a brief review of airway management options

Keywords: Montgomery T-tube,Difficult airway

INTRODUCTION

Tracheal stenosis is a condition where inflammation or scar tissue occurs in trachea that makes trachea narrower and makes it more difficult to breathe. The most common reason is prolonged intubation in ICU and when the cuff pressure is not monitored regularly.

The Montgomery tube was introduced in the mid-1960s to support the trachea following laryngotracheoplasty. In its original form, the device is an uncuffed silicone T-tube that is inserted with the long limb in the trachea and the short limb projecting through the tracheostomy stoma. It is a valuable option in the management of upper and mid–tracheal lesions. The proximal and distal end of the intraluminal limb is tapered to prevent mucosal abrasions. The proximal end is shorter compared to distal end. It is available in sizes ranging from 4.5 to 16 mm external diameter for pediatric and adult use, respectively[1].

The Montgomery T tube is a device which will be used as a combined tracheal stent and an airway after laryngotracheal surgery.The device is used mostly in specialized centres for head and neck surgery and therefore many anaesthetist may be unfamiliar with its use. The Montgomery T-tube presents the anaesthetist with challenges both during its surgical insertion and removal when acute loss of the airway might occur and also during induction of anaesthesia in patients who have such a tube in situ. Anaesthetists who are unfamiliar with the tube may have to resort to ingenious ways of coping with the problems of a shared airway with a T-tube. Safe management of such patients requires careful planning.

During the management of general anaesthesia for patients undergoing T-tube removal anaesthesiologist may have to deal with some difficulties such as loss of airway, hypoventilation, cant ventilate cant intubate situation. Hence we report a case of montgomery T-tube removal in a patient with tracheal stenosis which was managed successfully

CASE REPORT

15 yr old female o/c/o tracheostomy with T-tube insitu came for T- tube removal

Patient had history of dengue on september 2021 and was admitted in our hospital and was shifted to intensive care unit (ICU) and then intubated and put on ventilator in view of low GCS, extubation was done 1 week later , discharged and then sent home.

Patient developed breathlessness at her residence and was taken to our hospital, diagnosed to have tracheal stenosis for which tracheostomy and T-tube insertion has been done under GA on november 2021and then sent home with T-tube insitu now came for T-tube removal.

Preoperative systemic examination and investigations are within normal limits, CT neck and chest (plain) shows concentric narrowing of trachea at the level of C6,C7 and T1 vertebrae with T-tube insitu, informed consent was taken from the parents and she was kept NIL per oral for 6 hours prior to surgery.

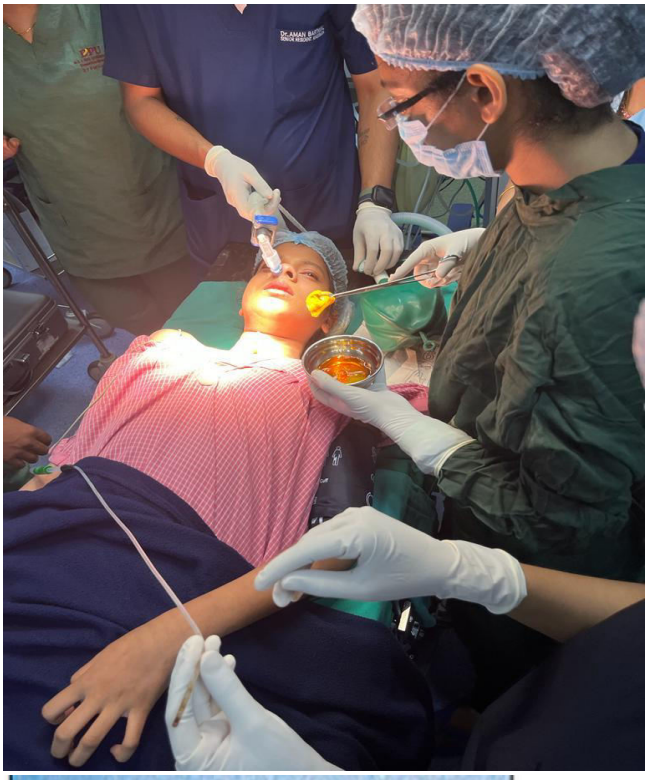
On the day of surgery consent checked, NBM confirmed OT was prepared in such a way emegency airway cot, laryngoscope blades, Cmac, stylet, bougie, second generation supraglottic airway device Igel 3no and 4no kept ready, emergency tracheostomy tray fibre optic bronchoscopy kept ready, bains circuit, nasal airway 6,6.5,7,7.5, endotracheal tube 6.5,7.5 kept ready

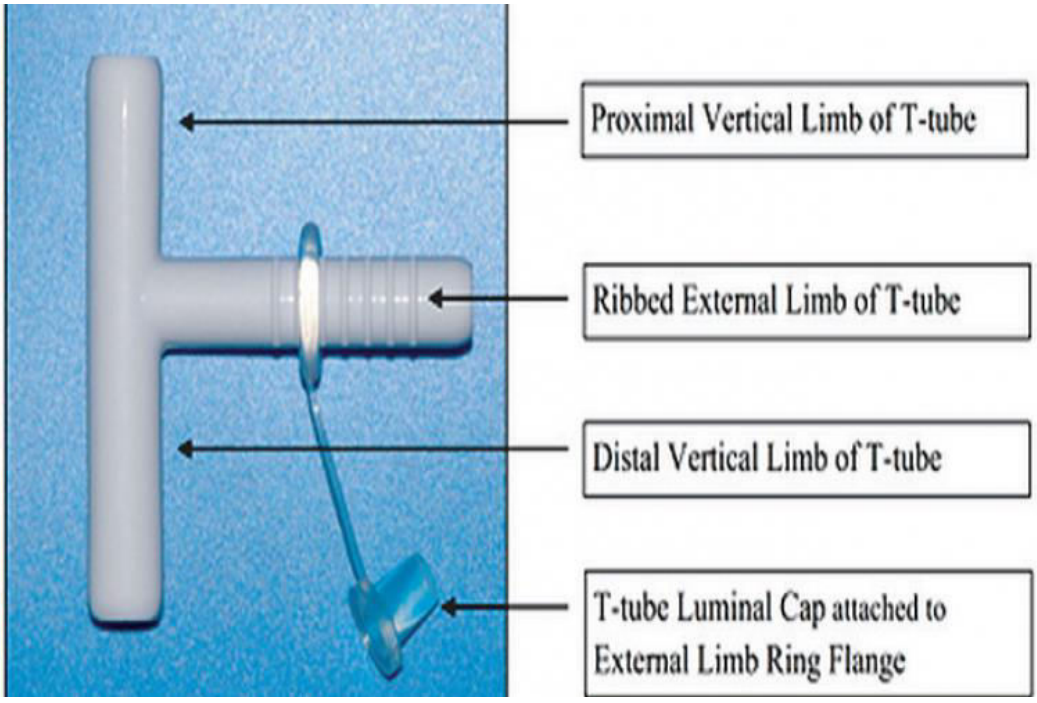
After receiving the patient in OT NIBP, ECG, pulseoximeter, IV fluids attached, nasal airway 7no inserted after topicalising with otrivin drops and lignocaine jelly bains circuit attached to nasal airway with universal connector and ETCO2 monitoring.

Patient was preoxygenated with 100% o2 for 3 mins via nasal airway, inj.glycopyrolate 0.004mg/kg IV + inj. Midazolam 0.02mg/kg IV given, inj. Fentanyl 2mcg/kg IV given

Considering the difficulty in airway fibre optic bronchoscopy with minimal sedation attempted as patient was uncooperative procedure abandoned, IV sedation with inj.ketamine 1mg/kg IV and propofol 1mg/kg in graded doses given ventilation was maintained with assisted spontaneous ventilation using Bains circuit.

Once patient was unconscious local infiltration given in tracheal area, incision taken approx 1cm below T-tube adhesions and granulation removed ,T-tube removal done airway patency assessed for 10 mins tracheostomy closure done and airway patency reassessed for 10mins, subcutaneoous and skin closure done procedure unevenful without any haemodynamic instability.





DISCUSSION

The unique design of Montgomery T-tube presents with various challenge for the anaesthetist. Most common problems encountered during removal include the following:

- The airway is not fully under the control of anaesthesiologist and may get complicated by sharing of surgical field with the airway.

- The nonstandard fitting at the external opening of the extratracheal lumen requires modification withthe tracheal tube 15mm connector for attachment of an anaesthetic circuit.
- Both the upper and lower end of intraluminal linb are open and therefore inspired gas may leak through upper end and may lead to hypoventilation ,inadequate depth of anaesthesia and chance of awareness
- Montgomery used a fogarty embolectomy catheter passed through extraluminal limb to the upper end to occlude the end by inflating its balloon[2] and a smaller size ET was then positioned in extraluminal limb next to fogarty catheter,other methods described in literature are using of oropharyngealpack[3] or laryngeal mask[4] airway to occlude the lumen
- As this patient was having concentric narrowing of trachea at the level of C6 and C7 once after the removal of T tube there's an high chance patient may have airway collapse leading to can't ventilate situation
- Inhalational induction of anaesthesia[5] was chosen over Iv induction agents since transient apnoea caused by them and or respiratory paralysis with neuromuscular blockers without means to prevent the upwards loss of gases would have been hazardous
- But in our case since the surgeon wanted to know the extend of tracheal stenosis and correct positioning of Ttube insertion of LMA or oropharyngealpack to prevent loss of gases at the upper end of intraluminal end,were unsuitable as they would have compromised the surgeons vision
- The preoperative preparation of airway with lignocaine spray and IV administration of fentanyl helped to reduce pressor response during procedure and decrease the anaesthetic requirement
- Review of preoperative computed tomography scans(CT) with the treating surgeons can aid in determining the extend of tracheal stenosis,visualizing the trachea before the procedure by indirect or video laryngoscopy can save vital time if an emergent airway becomes necessary
- The other options for managing if airway collapse had happened would have been removal of t-tube and insertion of a small-size TT or J-shaped laryngectomy tube . However the insertion of TT or ET, as it is would have enlarged the tracheostomy stoma and may have caused difficulty in weaning. Loss of airway control while removing or reinserting t-tube and kinking of t-tube at junction of extraluminal and intraluminal part, could have led to complete obstruction
- Adequate premedication and preoperative upper airway preparation combined with spontaneous breathing using inhalational or IV agents is the preferred anaesthetic technique

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