APPLICATION OF MONTGOMERY TUBE IN A CASE OF SUBGLOTTIC STENOSIS

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PRESENTATION OF CASE

A 24 year old male having meningitis was on ventilatory support for 15 days. He was discharged from hospital after 25 days of hospitalization. After 10 days he came to emergency ward with complaints of breathing difficulty. Endotracheal intubation was tried but in vain, his subglottic opening was stenosed on laryngoscopic view with Macintosh blade. Emergency tracheostomy was done to secure his airway.[1] Widening of subglottic opening by resection of granulation tissue and cauterization and Montgomery tube placement was planned under general anaesthesia. Preoperatively, extent and severity of stenosis, distance of stenosis from glottis and carina was assessed by surgeon.[2] CT neck and thorax was performed.

Thorough preanaesthetic check-up was done, patient had no other systemic abnormality. There is no fibreoptic bronchoscope or laryngoscope in our setup. Extra anaesthesia machine was kept ready for need of ventilation through tracheostomy route as well as LMA if needed, Laryngeal mask airway of sizes #3 & #4 along with emergency drugs were kept. After institution of non-invasive monitoring, 100% oxygen was given through tracheostomy tube, I.V. Glycopyrrolate 0.2 mg and I.V. Butrum 1 mg was given. Induction was done with Propofol 2 mg/kg and Atracurium 0.5 mg/kg, anaesthesia was maintained with 50% mixture of oxygen and Nitrous oxide along with 1-2% sevoflurane.

After dilatation and cauterization of cervical trachea T tube insertion was planned, tracheostomy tube was removed and laryngeal mask airway #4 was introduced. A gum elastic bougie was inserted through oral route through LMA and it was delivered through tracheal stoma to the exterior. The T tube was rail roaded into the trachea over this bougie. Once in place 5.5 no endotracheal tube was passed through T tube for maintaining the ventilation, but this process resulted in displacement of T tube and kinking of distal tracheal limb. After multiple attempts successful placement of T tube was possible. Proper T tube placement was checked by connecting an endotracheal tube connector of size 6.5 to the extratracheal limb of the tube. Bilateral air entry was checked by Ambu, LMA was removed after proper suctioning. Upper end of T tube was visible through glottis on video laryngoscopy.

Extratracheal limb of T tube was occlude by a spigot after confirmation of proper position of upper part of upper tracheal end as there was no fibreoptic laryngoscope. Anaesthesia was reversed and endotracheal tube was removed after proper suctioning. Patient was awake and his voice was recovered, his respiration was smooth, and he was maintaining SpO2 of 100% on room air, it was a rewarding experience for the whole team.

CLINICAL DIAGNOSIS

Subglottic Stenosis

DIFFERENTIAL DIAGNOSIS

- Subglottic tumour
- Subglottic haemangioma
- Vocal cord paralysis
- Laryngomalacia

Figure 1. Removal of Tracheostomy Tube and Montgomery Tube Placement

Figure 2. Ventilating Patient Through Montgomery Tube

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PATHOLOGICAL DISCUSSION

Subglottic tracheal stenosis is a life threatening condition resulting from airway narrowing due to trauma, burns, infections and most commonly prolonged intubation leading to symptoms such as coughing, breathing difficulty occasionally resulting in death due to respiratory failure.[3] Radical surgical resection & reconstruction are associated with restenosis and postoperative complications. Preoperative assessment and planning along with physical health of patient are important factors to be considered. Montgomery tube or commonly known as T tube which prevents collapse of airway post operatively provides safer & more effective treatment option.[4] Here, we are presenting this case of subglottic stenosis resulting from prolonged intubation, managed by T tube insertion as it's a rare & interesting case and involved many challenges for anaesthetist in our not so well equipped setup.

Among patients on prolonged mechanical ventilation incidence of tracheal stenosis is 1% and it is still on rising trend. Surgeries involving T tube insertion or upper airway surgery in a patient having T tube in situ, involves many an aesthetic challenges as there is acute loss of airway during insertion of Montgomery tube.

The Montgomery tube was first invented in 1964 by William Montgomery, a physician at Harvard Medical School. It is a 'T' shaped tube made up of silicon material. It is inserted with long limb in distal trachea and short limb projecting through stenotic lesion, the extratracheal limb projects through the tracheostomy stoma. The extratracheal limb has spigot, it is used for suctioning and maintaining ventilation in case of blockage of tube due to secretions or blood clots, otherwise it is kept close to facilitate orotracheal respiration. It is supplied in sizes from 4.5 -16 mm external diameter.

DISCUSSION OF MANAGEMENT

The Montgomery tube can be used in acute tracheal injury, as a stent after tracheal reconstruction, and as a substitute for non-reconstructible cervical trachea.[5] During insertion of this tube airway is not fully under control of anaesthetist until the tube is properly secured. The tube can become misplaced or kinked below the junction of the extratracheal portion with the intratracheal part, leading to complete airway obstruction. In such case, the Montgomery tube should be removed and reinserted appropriately.[6]

Use of rigid bronchoscope for insertion of T tube is recommended but it also does not ensure adequate ventilation during the procedure. This method is complicated and needs experience and skill.

Railroading the tube through Gum elastic bougie or Ryle's tube is also employed by many workers, loss of airway control and hypoventilation and air dilution of anaesthetic gases is always a concern during this procedure. LMA insertion provides safe and reliable method of airway control for anaesthetist during T tube insertion.

T tube is an effective and safe device for patency and remodelling of trachea and improves quality of life of patients. Better understanding and knowledge of indications and complications associated with T tube placement gives satisfactory outcomes.[7]

Final diagnosis was made by Indirect laryngoscopy and CT neck and thorax. Endoscope was used for direct visualization of glottis and lesion as fibreoptic bronchoscope was not available.

FINAL DIAGNOSIS

Subglottic Stenosis Resulting from Prolonged Intubation, Managed by T Tube Insertion.

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