



## SUBMENTAL OROTRACHEAL INTUBATION IN EXTENSIVE MAXILLOFACIAL TRAUMA: A BETTER ALTERNATIVE TO TRACHEOSTOMY

### Anaesthesiology

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### ABSTRACT

Faciomaxillary injuries are very common following trauma, specifically following road traffic accidents. Such patients require surgical stabilization and fixation of the fractures. Submental intubation is a better alternative to tracheostomy, especially when short-term postoperative control of airway is desirable with the presence of undisturbed access to oral as well as nasal airways and a good dental occlusion. Here, we opted for the sub-mental endotracheal intubation and patient was extubated successfully and was hemodynamically stable. Our case report re-establishes that submental intubation is a useful alternative of airway management in patients with panfacial fractures. It demands a certain surgical skill without specialized equipments; however, it is safe and quick to execute. It allows intraoperative correction of occlusion and enables surgery for associated nasal fracture in the event of concomitant skull base trauma, and avoids complications associated with tracheostomy.

### KEYWORDS

Submental intubation, Pan facial fracture, Tracheostomy

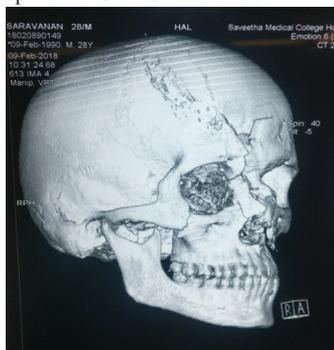
### INTRODUCTION:

The anaesthetic management of patients with maxillofacial injuries presents unique challenges especially with regard to the airway. Tracheostomy had been used previously to establish the airway in such patients. The submental route of intubation has emerged as an alternative to tracheostomy in the airway management of patients with maxillofacial injuries since its introduction in 1986 by Altimer. We present a 28-year-old male with complex maxillofacial trauma where we opted for sub-mental endotracheal intubation.

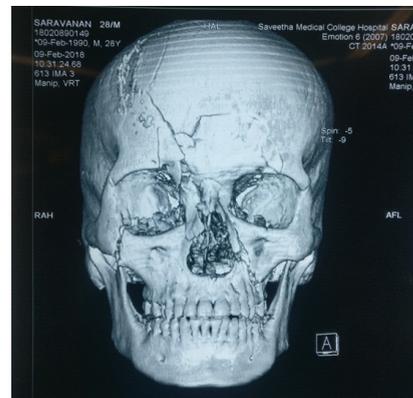
### CASE REPORT:

A 28-year-old male presented with pain in the left mid facial region and forehead following an RTA. His blood investigations were normal. CT Brain with facial bones showed multiple fractures of frontal bone, sphenoid bone, right nasal bone, displaced fractures of both maxillary sinuses, and medial and lateral pterygoid plates. Mouth opening was normal, Mallampatti Grade-I, loose teeth and unrestricted neck movements. He was posted for open reduction under GA.

After fasting for 6 hours he was premedicated with intravenous glycopyrrolate 0.2mg, ondansetron 4mg and ranitidine 50mg. Preoxygenation with 100% oxygen was done for 3 minutes and after ascertaining bag-mask ventilation, induction was done with IV fentanyl 2-mcg/kg, propofol 2-mg/kg and atracurium 0.5mg/kg. Orotracheal intubation done using 8.0-cuffed flexometallic endotracheal tube and position was confirmed with capnography and SpO<sub>2</sub>. Submental intubation was done. Throat pack was inserted. Anesthesia was maintained with O<sub>2</sub> and N<sub>2</sub>O (50:50), isoflurane and atracurium (0.1mg/kg). At the end of surgery, sub mental intubation was converted into orotracheal intubation. After return of oropharyngeal reflexes, reversal was done with intravenous neostigmine 0.05-mg/kg and glycopyrrolate 0.01 mg/kg. Throat pack was removed and patient was extubated awake.



**Figure 1: Lateral view of the 3D reconstruction of CT- Facial bones showing multiple maxillofacial fractures.**



**Figure 2: Anterior view of the 3D reconstruction of CT- Facial bones showing extent of the fractures.**

### TECHNIQUE:

1. Incision made in the submental region and blunt dissection using an artery forceps performed to floor of mouth.
2. Oral mucous membrane incised to create mucocutaneous passage.
3. Pilot tube and balloon of ETT guided through this mucocutaneous tract using an artery forceps.
4. Patient disconnected from ventilator circuit and universal connector removed from ETT.
5. Oral component of ETT pushed back into the floor of the mouth and into the mucocutaneous tract.
6. Oral component of ETT exteriorized through the submental incision guided by artery forceps and reconnected to ventilator.
7. Correct position confirmed with auscultation and capnography and ETT position secured with sutures.



**Figure 3: Orotracheal intubation has been done and ET tube is fixed at the angle of the mouth.**



**Figure 4:** Pilot tube and balloon of ETT guided through this mucocutaneous tract using an artery forceps.



**Figure 5:** ETT position secured with sutures and connected to the ventilator circuit.

#### DISCUSSION:

Airway management is a primary concern in all maxillofacial surgeries. A good surgical access should be provided for the surgeon and at the same time, the safety of airway and ventilation should not be compromised. Modern techniques for surgical treatment of midfacial and panfacial fractures in maxillofacial trauma pose special problems for airway management.

Nasotracheal intubation should be avoided in these patients as it can complications such as cranial intubation, epistaxis, trauma to the pharynx, pressure necrosis of external nares, otitis media, sinusitis, sepsis and inability to pass a tube through nasal passages. Often surgical correction of these nasal fractures requires tube-free surgical areas, which can be achieved by opting for avoidance of nasal intubations. Orotracheal intubation significantly hinders manoeuvres for reduction and stabilization of the jaws, which often requires immobilization with arch bars and wires. Hence oral intubation is avoided.

Tracheostomy is an alternative for short-term airway management. However, tracheostomy has its own set of complications. These include laryngeal or tracheal stricture, haemorrhage from large blood vessels, tracheo-oesophageal fistula, cardiac arrest caused by stimulation of vagus nerve, post-hypercapnic shock due to sudden lowering of the carbon dioxide level and air embolism. Early local complications include haemorrhage, subcutaneous emphysema and recurrent laryngeal nerve damage. Submental intubation provides a secure airway, allows maxillofacial fixation while avoiding the drawbacks and complications of tracheostomy which include hemorrhage, surgical emphysema, recurrent laryngeal nerve injury, tube blockage, tracheal stenosis and is too invasive. Minor complications such as superficial skin infection, orocutaneous fistula and transient lingual nerve palsy associated with submental intubation are less frequent than those associated with tracheostomy.

Furthermore, it requires minimal postoperative care and is less invasive.

#### CONCLUSION:

There is still no consensus regarding superiority of one technique over another as a mode of securing airway in complex craniofacial injury repair. Paucity of published literature and quality of evidence limit definite recommendation on its use. Patient's ability to cooperate with the procedure, liaison between the surgeons and the anesthesiologists, experience of airway managers to deal with the situation, and benefits of single versus multiple surgical interventions are important considerations. Prolonged period of time is required for the adequate planning, preparation of the patient, personnel and procedure, which limits the utility of this technique in emergency situations. Submental intubation is a better alternative to tracheostomy for fixation of pan facial fractures. Though it demands some surgical skill, the technique is simple, rapid, and easy to learn. Its other advantages include minimal complication, better cosmetic appearance and lesser expenses.

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