

# Submental Intubation: A Valuable Technique for Airway Management in Complex Head and Maxillofacial Trauma: A Case Report

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**Abstract:** *Patients with complex head and maxillofacial trauma present with unique challenges to the anesthesiologist. Provision and maintenance of a secured airway control throughout the surgery is of prime importance. It is always needed to explore the better available options for airway management according to the individual needs of patients and surgery. Submental intubation (smi) is one such technique that can be very useful. Submental intubation is an interesting 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. There were no perioperative complications related to the submental intubation. Submental intubation is a simple technique associated with low rates of morbidity. It is an attractive alternative to tracheotomy in the surgical management of selected cases of panfacial trauma. We report an interesting case of leforte type 3 injury for open reduction and internal fixation with plating, for which we opted for submental intubation as an airway management.*

**Keywords:** submental intubation, maxillofacial, fractures, tracheostomy, airway

## 1. Background

An airway management is of utmost important in complex maxillofacial trauma patients as most of the time airway anatomy is disturbed. Therefore securing an airway is always a challenge to anaesthesiologist in the management of complex maxillofacial trauma.

Airway management in such cases can be either nasotracheal intubation or tracheostomy. Nasotracheal intubation gives access to all kind of approaches and removes all disturbances for intermaxillary fixation (imf). but, sometimes nasal intubation is contraindicated and in such situations tracheostomy is considered as most common way of securing an airway. (1)

A Spanish author hernández - altemir first described the use of a sub-mental approach for orotracheal intubation. This technique was advised for procedures involving transoperative imf, to avoid the tracheostomy and its possible complications. (2)

A recent reviews suggest that submental intubation (smi) is a useful, simple and safe alternative technique for airway management in panfacial fractures. (3) Additionally, submental intubation allows majority of intra and extra oral approaches and making the oral cavity free of disturbances for intermaxillary fixation with most appropriate dental occlusion. Therefore smi was recommended for procedures of selected cases of maxillofacial fractures. (4) (5) we are reporting an interesting case of a young male having le forte

type 3 injury following road traffic accident posted for open reduction and internal fixation with plating.

## 2. Case Description

A 34-year-old male victim of a road traffic accident with cranial and facial trauma was proposed for an open reduction and internal fixation with plating for fractures of bilateral infraorbital rim with bilateral maxilla and bilateral nasal bone at Divine Life Hospital, Adipur - Kutch. After complete preanaesthesia evaluation with relevant cross references patient was given fitness under high risk consent.

On airway examination, the patient had restricted mouth opening of 2–2.5 finger breadth with mild bearable pain, Mallampati class 3, no loose teeth and normal neck movements.

A plan for general anesthesia with submental endotracheal intubation was made.

After explaining the procedure, written and informed high risk consent was taken. Then patient was shifted to operation theatre. Monitors were attached, and vitals were noted (pulse - 84/minute, blood pressure - 120/84 mm hg, spo2 - 98%). Intravenous (iv) access was secured with two 18 gauge iv canula and iv fluids were started.

An adequate preoxygenation with 100% oxygen for 5 minutes and premedication with injection glycopyrrolate (0.2 mg), midazolam (1 mg) and ondansetron (4 mg) was done. Then general anaesthesia induced with injection

fentanyl (150 mcg), propofol (150 mg) and cis - atracurium (14 mg). intermittent positive pressure ventilation done for 180 seconds and orotracheal intubation was performed with a reinforced cuffed endotracheal tube no.8. It was confirmed with auscultation and endtidal co2 readings. Throat packing was done using moistened gauze tape with the help of magill's forceps. Eye tape was applied and the head was positioned on the head ring. Under all aseptic precautions, painting and draping of submental area was done.

Afterwards, a 2 - centimetre submental incision was performed. Initially curved hemostat forceps were introduced into the incision and then passed through the subcutaneous layer, mucosal layer and into the sublingual space by creating a submental tunnel. First, the cuff of the et

tube was deflated and pilot balloon taken out through the submental tunnel in the submental area with artery force p and inflated again. Now the 15 mm connector was removed and the machine end of the et tube was also taken out to submental area. The breathing circuit was connected again along with the 15 mm connector and bilateral air entry was checked by auscultation and confirmed by capnography. The ET tube was secured to the submental area with sutures and through oropharyngeal suction was done. Surgery progressed and completed without any complications. The airway tube was placed back to its oral position and the submental region was sutured. Extubation was performed in awake state. the patient was discharged without any complication during his stay. Patient followed - up after a month, with a good recovery and minimal scarring.

**Table 1: indications and contraindications of submental endotracheal intubation.**

Indications	Contraindications
Midface fractures with occlusal alterations	Need for long - term airway maintenance
Panfacial fractures	Multiple mandibular fractures requiring submental or transcervical approaches
Nasal fractures associated with occlusal alterations	Associated cranial base fractures
Le fort ii and iii fractures	
Posterior nasal bleeding	
Intranasal pathologies	
Conditions when conventional nasotracheal intubation or nasofibrosopic intubation is not possible	



**Figure 1**

### 3. Discussion

SMI is a simple, secure, and effective airway option for airway management in selected maxillofacial traumas which was first described in 1986 by altemir as an alternative to tracheostomy. (2)

Panfacial fractures with skull base fracture with or without cerebrospinal fluid rhinorrhea, distorted nasal anatomy, and situations where nasal packing is required precludes nasal intubation.

In such situations tracheostomy is considered as a choice of

securing an airway. Although tracheostomy has its own set complications. It is difficult to perform in obese patients, children, and patients with thyroid swelling. The complications of tracheostomy include haemorrhage, bleeding, surgical emphysema, pneumothorax, pneumomediastinum, recurrent laryngeal nerve palsy, stomal and respiratory tract infection, tracheal stenosis, tracheal erosions, dysphagia, tracheoesophageal fistula, problems with decannulation, suboptimal visible scar. Also it needs careful perioperative management. (6) (7)

In our case, patient was having afractures of bilateral maxilla, inferior orbital rim and nasal bone with h/o nasal bleeding posted for open reduction and internal fixation.

hence a decision of general anaesthesia with smi was taken to carry out surgery.

The primary advantage of the submental intubation is the to avoid a tracheostomy with its resulting morbidity and complications. the risks and complications associated with submental intubation are less frequently seen as compared to tracheostomy. The time required to complete submental intubation is less than the time required for tracheostomy and the resulting scar is more aesthetically acceptable. (5) (8) (9) minimal postoperative care and ease of reversibility also support the benefits of the submental technique over tracheostomy, whenever appropriate. In patients without a need for long - term ventilatory support, smi provides an attractive alternative to a tracheostomy. (5) (6) (10)

Submental intubation technique also provides the ability to ensure adequate dental occlusion throughout the procedure which is of great benefit. Any oral tube would prevent any analysis and precludes adequate dental occlusion. So instead of by manipulating and to work around the tube, the submental intubation technique allows for a better and undisturbed operative field as well. (8) (9)

In the present case, a decision of smi was taken under all aseptic precaution with reinforced endotracheal tube to give the benefits of a secured airway, optimal surgical exposure, and good dental occlusion for better surgical outcome. our experience is similar with a comprehensive literature review of 812 patients by Jundt et al. (11)

SMI is associated with its own set of complications such as et tube damage, endobronchial intubation, et tube obstruction, accidental extubation, bleeding, orocutaneous fistula, hypertrophic scar, mucocele infection, and lingual nerve paresthesia. majority of these complications can be prevented and avoided by measures like the use of meticulous surgical technique, strict aseptic precautions during handling of airway equipment in the surgical field and use of wire reinforced et tube etc. (9) (12)

The primary objective of our case report is to provide safe and secured airway. However, smi is not intended to replace tracheostomy, but in selected cases of facial trauma or orthognathic surgery it may be a better option. our patient tolerated this method successfully with secured airway and adequate field for the surgeon to fix the facial fractures. More research into this area of airway management is warranted.

#### Learning points:

- SMI provides superior airway protection to anaesthesiologist in complex maxillofacial trauma with a clear surgical field.
- SMI can be a useful and safe alternative to tracheostomy for selected fasciomaxillary trauma surgeries with early recovery.

#### Funding

The authors did not receive sponsorship to carry out this article.

#### Conflicts of interest

The authors have no conflicts of interest to disclose.

Right to privacy and informed consent.

The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

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