

Transmylohyoid Intubation in the Management of Maxillofacial Fractures: A Case Report

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Abstract

Submental/transmylohyoid intubation in the management of maxillofacial fractures is an alternative for airway management where oro-endotracheal or naso-endotracheal intubation is contraindicated and tracheostomy can be avoided.

Submental intubation allowed reduction and fixation of all fractures without the interference of the tube during surgical procedure in all of the patients. There were no intra-operative complications and none of the patients required post-operative ventilation. There were no significant post-operative complications.

Submental intubation is a safe and extremely useful procedure in severe maxillofacial injuries. It has a low incidence of operative and post-operative complications. It allows both the surgeon and the anaesthetist to deliver a better quality of patient care.

Keywords: Transmylohyoid, intubation, submental intubation, airway, maxillofacial fractures.

Introduction

Airway maintenance in craniomaxillofacial trauma patients is challenging due to disrupted anatomic structure of upper airway.¹Nasotracheal intubation is not recommended in presence of panfacial fracture, comminuted midface fractures, cervical spine injury, skull base fracture with or without CSF rhinorrhea, systemic coagulation disorders and when nasal packing is indicated^{2,3}In maxillofacial trauma, orotracheal intubation cause interference in maxillomandibular fixation (MMF) which is required for achieving functional occlusion.²

Tracheostomy is an option for airway management but it is associated with complications such as hemorrhage, subcutaneous emphysema, tracheal stenosis, pneumomediastinum, pneumothorax, damage to recurrent laryngeal nerve and respiratory tract infection.^{2,4,5}

Submental intubation is an alternative method which provides adequate airway access where naso or orotracheal intubation is inadvisable. Submental/transmylohyoid intubation was first introduced by **Hernández Altemir F**

in 1986 to avoid the tracheostomy and in patients ineligible for nasotracheal intubation.⁵

We are reporting a case of submental intubation in a patient of zygomatico-maxillary (Right) and parasymphiseal fracture of mandible on right side.

Case report

A 34 years male reported in the department of Oral and Maxillofacial surgery, Sardar Patel Postgraduate Institute of Dental and Medical Sciences Lucknow with pain and swelling on the right side of face and lower jaw since last 2 days. Patient also had reduced mouth opening and difficulty in mastication resulting from a road traffic accident.

Clinical and radiological findings were suggestive of zygomatico-maxillary (Right side) and parasymphiseal fracture of mandible on right side. Routine investigations were done and planned for open reduction internal fixation under general anesthesia. Written informed consent was obtained from the patients. Upper and lower arch bar was placed and a standard regimen of antibiotic and analgesic was started preoperatively.

Surgical Technique

Orotracheal intubation was carried out following standard protocol. A 2cm skin incision was marked and made in para-median region of the submental area, directly adjacent to the lower border of mandible. The muscular layer (platysma and mylohyoid) was traversed using a pair of curved artery forceps that was always in contact with the lingual cortex of the mandible. The mucosal layer in the floor of the mouth was incised over the distal end of the forceps and the forceps was opened creating a tunnel.

The tube was passed in two steps: The tube cuff was first exteriorised from mouth passing through the tunnel with the help of forceps. The same maneuver was carried out with the proximal end of the tube itself after disconnection from the ventilator and the tube connector.

After the tube is positioned, the connector was re-attached to the tube and the circuit was re-established. The tube was secured onto the skin in the transmylohyoid region with 3-0 silk and adhesive tape. At the end of surgery the maxillomandibular fixation was released and transmylohyoid intubation was converted to oral intubation and extubation was done in the classic manner

Discussion

It is important to maintain patent airway in management of maxillofacial trauma⁶. The commonest treatment modality for maxillofacial trauma is open reduction and internal fixation. Intra-operative maxillomandibular fixation (MMF) is essential to restore pre-traumatic occlusion and anatomic reduction which precludes the use of oro-tracheal intubation⁴.

Nasotracheal intubation is contraindicated in case of skull-base, naso-orbital-ethmoid and pan facial fracture.⁴ When both oral and nasal routes of intubation cannot be chosen, tracheostomy is next option, but it has its own disadvantages such as hemorrhage, pneumothorax, pneumo-mediastinum, injury to recurrent laryngeal nerve and tracheal stenosis.⁷ In literature 14% to 45% complication rate for tracheostomy has been documented therefore it should be opted very judiciously.⁸

Figueiredo et al.⁹ stated that submental intubation combines the advantages of both nasoendotracheal and oro-tracheal intubation, which allows the reduction of fracture segments, restore dental occlusion and allows access to fronto-nasal fractures. It also avoids the risks of complications of tracheotomy.

Altemiret al.¹⁰, **Gadre** and **Kushte**¹¹ emphasized the surgical performance of submental incision made in the para-median region, in the anterior vertex of the submandibular triangle parallel to the mandibular lower border, which is an anatomically "clear zone". In our patient, we opted to use single reinforced endotracheal

tube, through paramedian transmylohyoid approach. Submental intubation allowed all the surgical procedures without any interference in the surgical field.

Complications for transmylohyoid intubation technique includes detachment of pilot balloon, damage to the cuff of the endotracheal tube, dislodgement of the tube from trachea, abscess formation in the floor of mouth, infection of the transmylohyoid wound and facial scarring. Complications associated with transmylohyoid intubation can be avoided by following a proper surgical technique. Chanduet al.¹² mentioned two episodes of dislodgement of tube from trachea. Due to absolute care taken throughout the procedure, we never encountered such problems.

K. A. Jeevan Kumar et al.⁶ and **N Kishoria et al.**¹³ stated that for the patient with panfacial or midfacial fracture, submental intubation procedure remains a useful and one of the best procedure available. They achieved adequate reduction of fracture segments followed by fixation and occlusion without interference from the intubation intraoperatively without compromising the airway.

Duration of intubation (calculated starting from commencement of oral intubation to the fixation of tube in transmylohyoid area) was recorded to be 6 minutes and duration for extubation (calculated from release of suture to the shifting the tube to oral cavity and extubation) was 4 minutes. Similarly, **S. Thomas, Y. Vaithilingam et al.**² recorded the mean time for intubation is 9 min and for extubation is 2.5 min which is slightly greater than the overall results of our study. There is no effect on the time of the surgery reported with this technique.

Damage to any vital structure (sublingual vessel/ lingual nerve/salivary gland/duct etc.) was not observed in the patients. No restriction of tongue movement, any dehiscence and abscess was noted in the patient at any point of time during follow up visit.

Surgeon found no interference in visualization and accessibility in all the procedures due to submental intubation. Ease of intubation, extubation, saturation control and monitoring was observed by the anaesthetist in the patient.

Conclusion

Transmylohyoid intubation is alternative option for intraoperative airway management in maxillofacial trauma patients. We experienced that transmylohyoid intubation is a simple technique with low morbidity. The technique required no specialized equipment or additional training. It has the advantages of both orotracheal and nasotracheal intubation by allowing access to the intraoperative occlusion correction and nasal pyramid, respectively. Transmylohyoid intubation has proven effective in terms of both the result and surgical time required. It has a low incidence of operative and postoperative complications and eliminates the risks of tracheostomy.

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Legends Figure



Fig 1: Extraoral Incision in the submental region.



Fig2: Final position of the Endotracheal tube