

Submental intubation for panfacial trauma

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Summary: In maxillofacial injuries wherein patients report with panfacial fractures, airway management in these types of cases are still a challenge to the anesthesiologist. Out of different modes of intubation such as oroendotracheal intubation, Nasoendotracheal intubation, tracheostomy and submental endotracheal intubation an anesthetist and the maxillofacial surgeon have to plan the best way of intubation so they can achieve the proper intubation, best maxillofacial reduction and fixation, and less postoperative complication. In this article we present a case where we had planned the submental endotracheal intubation.

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I. Introduction

In maxillofacial polytrauma, which involves fracture of multiple facial skeleton such as base of skull, midface and the mandible, the routine nasoendotracheal intubation is contraindicated. These comminuted multiple fractures of midface and the mandible can cause visual and physical obstruction to the passage of nasotracheal tube into nasopharynx¹¹. Further the presence of nasotracheal tube can interfere with the open reduction and fixation of these complex panfacial fractures¹. In most of the maxillofacial trauma cases the anesthetist usually secure the airway with nasotracheal intubation. Out of various techniques of airway management performed by the anesthetist in maxillofacial trauma oroendotracheal intubation, nasoendotracheal intubation, Blind nasal intubation, fibro-optic guided nasal intubation, tracheostomy and submental intubation remain the only option. All the above techniques has its own advantages and disadvantages operatively and postoperatively¹⁰. In panfacial trauma during our literature search we noticed that submental intubation has been described as a more useful alternative to other intubation modalities with minimal complications.

II. Case Report

A 32 year old male patient met with a road traffic accident and was admitted in the casualty of People's hospital. On admission patient was conscious with a GCS of 15 (E₄ V₅ M₆). On extra oral facial examination patient had diffuse facial swelling in the mid face, epistaxis, bilateral subconjunctival hemorrhage, bilateral periorbital edema with cerebral spinal fluid rhinorrhea. On intra oral examination there was restricted mouth opening and deranged occlusion.

On extra oral palpation step deformity could be noticed in infra orbital region bilaterally, crepitation in nasal bone and bridge of nose was collapsed. On intra oral palpation there was mobility in maxillary segment which was indicative of Le-Fort fracture. Patient had complained of pain in panfacial region. After stabilizing the patient, the patient was sent for radiological examination. 3D computerised tomography { Fig 1 } revealed that patient had bilateral Le-Fort III fracture, dentoalveolar fracture of mandible with sub condyle fracture and fracture of nasal bone.



Fig. 1

After the condition of patient was stabilized surgical management of panfacial trauma was planned. The patient was scheduled for surgery. Since the patient had nasal fracture which needed to be addressed hence nasoendotracheal intubation was not appropriate. Since occlusion was dearranged in this patient intra operatively maxillo-mandibular fixation was required to check the occlusion hence orotracheal intubation was not indicated. To avoid complications of pre-operative and post operativetracheostomy the maxillofacial surgeon and anesthetist agreed to plan sub mental endotracheal intubation.

Patient was kept on NBM a night before the surgery with routine antibiotic and analgesic. Patient was given injection Dexona 8mg intravenous HS and one hour prior to the surgery. On direct visualization from laryngoscope no. 7.5 cuffed flexometallic endotracheal tube was used to do oroendotracheal intubation. Submental site was prepared for surgery. Local anaesthesia with 2% adrenaline was infiltrated for achieving haemostasis. After 10 minutes a 2cm incision was made in right submental region medially and parallel and 2cm below the inferior border of mandible. Blunt dissection was done medial to the body of mandible and intra oral site was exposed lingually. The flexometallic endotracheal tube was briefly disconnected and tube connector was removed. The pilot balloon and the endotracheal tube were gently pulled out through the incision with the help of artery forceps. After the endotracheal tube was noticed extra orally, the tube connector was reattached and reconnected to Boyle's apparatus {fig 2}.



Fig. 2



Fig.3

Intra orally tube was examined for kink and acute bend to avoid any airway obstruction. After checking bilateral air entry the endotracheal tube was fixed with 2-0 silk sutures {fig 3}. Since the endotracheal tube was in lingual side hence it was easy to perform inter maxillary fixation and check the occlusion when the patient was intubated. Since the endotracheal tube was away from surgical site hence fixation of bilateral Le-Fort fracture of maxilla and nasal bone was performed smoothly. Following reduction and fixation, primary closure was done and maxillo-mandibular fixation was released to check the passive occlusion. At the end of surgery, the sub mental intubation was converted to oral intubation by first pulling the pilot balloon then the endotracheal tube intra orally. And the sub mental incision was primarily closed by 3.0 silk sutures. Patient was allowed to regain consciousness and after the return of productive reflex endotracheal tube was removed. Intra operative and post operative surgery was uneventful. Apart from operative procedures, post operatively we have examined extra oral wound{Fig. 4}for any abscess in floor of mouth, any scar or any wound dehiscence.



Fig.4

III. Discussion

During any maxillofacial surgery the management of airway and reduction and fixation of fracture bony segment is of primary concern as far as maxillofacial surgeon is concerned. His prime concern is to operate the field away from the endotracheal tube to view and check the occlusion whenever required so that a proper management of fracture segment can be done. As far as the anesthesiologist is concerned the safety of the tube and efficiency of the ventilation is of prime importance⁸. In 1986 sub mental route of intubation was first described by Altemir^{1 6}. The advantage of this technique was to provide a secure airway, unobstructed intraoral and extraoral surgical field, allow intermaxillary fixation and allow easy reduction and fixation of bony fragments^{1 2 3 4}.

During Pubmed search, the use of submental intubation was also noted in selected cases like orthognathic surgery and cranial base surgery³. In our case, since the patient had deranged occlusion, left III fracture with nasal bone fracture and CSF rhinorrhea, all these factors precluded towards submental intubation.

Although other procedures like tracheostomy is also being advocated in such cases but its postoperative complications like hemorrhage, subacute emphysema, pneumothorax, laryngeal nerve damage, tracheal erosion causes its limitations.

In 1998 Martilez- Lageet all proposed an alternative technique which was called as retro molar intubation where a semi lunar osteotomy is made in retro molar space and the orotracheal tube is placed in this retromolar region.

For a successful submental endotracheal intubation it is mandatory to have a good communication between surgeon and the anesthesiologist⁸.

Sub mental intubation is contraindicated if mechanical ventilation or intubation is required for longer period postoperatively, patient present with neurological deficit or thoracic trauma. In those cases submental intubation should be switch over to standard orotracheal intubation.

Other contraindications of sub mental intubation includes basilar fracture and Nasal orbital ethmoidal fracture¹⁰. As per the author's view perioperative antibiotic cover, good oral hygiene and not very tight closure of sub mental incision result in lesser complication of sub mental intubation.

IV. Conclusion

To conclude, in case of selective panfacial trauma submental intubation is useful and relatively harmless as compared to other available procedures. This procedure allows intraoperative correction of occlusion and enables surgery of associated nasal bone fracture. Hence sub mental intubation should be chosen. As it demands certain surgical skill, simple, safe and less time consuming to execute.

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