

Sub Mental Intubation in Facio-Maxillary Injury

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ABSTRACT

Background: Airway management in patient with Facio-Maxillary injury is challenging due to disruption of components of upper airway, and anesthesiologist has to share the airway with the surgeons. Submental Endotracheal Intubation is safe, simple and useful technique, where oral and nasal Endotracheal Intubation cannot be performed. It avoids tracheostomy and its consequent morbidity. Here is described a case of Submental endotracheal Intubation in a 52 years old patient with panfacial trauma (FMI). He was scheduled for surgical reconstruction involving Maxillo-Mandibular Fixation. Intermittent intra-operative, dental occlusion was needed to check alignment of fractured segment. Patient had nasal bone fracture and crush injury to tongue and its challenging task for an anesthesiologist to manage such airway without further damage to upper airway. Several techniques have been proposed. In this case Submental endotracheal Intubation technique for surgery with the help of surgeon was used and intra operative and post-operative period was uneventful.

Keywords: Faciomaxillary injury, Submental intubation.

INTRODUCTION

Surgical repair of Faciomaxillary injury requires modification of anesthesia technique. Nasal endotracheal Intubation is not possible with fractured nasal bone with CSF rhinorrhea. Communicated midfacial fracture cause physical obstruction to passage of nasotracheal tube and further presence of nasotracheal tube interfere with surgical reconstruction of fracture of nasal bone. Surgical reconstruction involves zygoma fracture repair and maxillo-mandibular fixation in the intra-operative period to restore the patency of dental occlusion. This precludes use of oral Endo-Tracheal Intubation in such cases.

In these conditions alternatives are Tracheostomy and retromolar Intubation.

Tracheostomy carries significant morbidity, and for retromolar intubation, retro-Molar space may not be adequate in adult patient.

CASE REPORT

A 52 years old male met with a road traffic accident and was admitted to emergency department. On admission, patient was conscious with Glasgow Coma Scale (GCS) of 15. On examination there was facial swelling, epistaxis, bilateral periorbital edema, bilateral subconjunctival hemorrhage, and CSF rhinorrhea.

Radiological investigations were suggestive of fracture of right zygoma, bilateral maxilla fracture, fracture of nasal bone and mandible midline fracture. Nasoendotracheal intubation was contra indicated in the presence of CSF rhinorrhea, nasal bone fracture and epistaxis. Oral-endotracheal intubation was not possible as surgical



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Fig 1: Patient with Sub Mental Intubation.

procedure involves intra-operative intermaxillary fixation to check occlusion. All laboratory investigation like ECG, CXR and Echocardiography were normal. Patient was kept fasting for 8 hours pre operatively and monitored for ECG, NIBP, SpO₂, EtCO₂ and urine output. Patient was pre oxygenated with 100% O₂ over 5 minutes. Anaesthesia was induced with premedication with inj Glycopyrrolate 0.2 mg, inj Fentanyl 2 mcg/kg, inj ondansetron 8 mg, and inj Propofol 2 mg/kg i.v. Ventilation was checked and was found to be adequate. Injection suxamethonium 1.5mg/kg i.v. was given. On direct laryngoscopic examination no airway edema was seen. Endo-Tracheal intubation was performed with armoured 8.0mm cuffed tubed. Anaesthesia was maintained with 50% oxygen in nitrous oxide with sevoflurane (Figure 1). Intra operatively analgesia was maintained with Inj, morphine 0.1 mg/kg i.v. and muscle relaxation achieved by Inj Atracurium 0.5 mg/kg i.v. bolus was followed infusion.

A 2cm incision was made in submental region parallel and medial to inferior border of mandible by the surgeon. It was extended intraorally through myohyoid muscle by blunt dissection. The endotracheal tube was briefly disconnected from the breathing circuit and the tube connector was removed from the tube. The pilot balloon followed by endotracheal tube was gently pulled out through the incision. Tube connector was reconnected and endotracheal tube

reconnected to the breathing circuit. Bilateral air entry was rechecked and found to be equal on both side and tube fixed with silk suture.

So intra-operative tube was away from the surgical field and surgeon could easily do inter-Maxillary fixation to clear occlusion. The total duration of surgery was 5 hours. At the end of surgery, submental endotracheal intubation was converted to oral intubation. First pilot balloon and the endotracheal tube were pulled intra orally. Submental incision was closed with sutures.

Direct laryngoscopy was performed again which showed no airway edema. So neuro muscular blockage was reversed with injection glycopyrrolate (0.04 mg/kg) and injection neostigmin (0.05 mg/kg) i.v. Patient was allowed to regain consciousness and trachea was extubated after the return of protective reflexes.

Intra operative and post-operative periods were uneventful. No episode of desaturation while converting oral intubation to submental intubation and vice-versa were seen. Tube connector was easily removed and reattached firmly. Care was taken not to damage the pilot balloon. Endotracheal suction was easily administered through the submental route. Peri operative patient received antibiotic coverage and oral hygiene was maintained. No complication was noted and the submental scar after 2 months was almost invisible.

DISCUSSION

Altermir, first described the submental route for Endo-Tracheal Intubation in 1986. Submental Endo-Tracheal Intubation provides a secure airway, unobstructed intraoral surgical field and allowed maxillo mandibular fixation while avoiding the complications and drawbacks of nasotracheal intubation tracheostomy⁸. Nasotracheal intubation is not possible in presence of fractured nasal bone and CSF rhinorrhoea. Any attempt towards nasotracheal intubation can lead to passage of tube in to cranium, meningitis, sepsis and sinusitis^{7, 8, 9}.

All these conditions precludes nasotracheal intubation. Tracheostomy, an alternative technique but it is associated with complications like subacute emphysema, haemorrhage, pneumothorax, recurrent laryngeal nerve damage, respiratory tract

infection, pneumomediastinum, tracheal stenosis, dysphagia, excessive scarring and decanulation.^{1,2,6}

Sub-mental intubation is not free of adverse events and complications. Problems can occur while Endo-Tracheal tube is passed through the incision from interior to exterior. It may be difficult to pass the tube through incision or reattach the connector to Endo-Tracheal tube. These can be overcome by modified Green and Moore 's two tube technique. This technique is more useful when design of tube prevents removal of tube connector. However grasping and drawing the tracheal end of Endo-Tracheal tube can damage the cuff.

Maclnnis and Baig used slight lateral exit wound submentally and then they modified the technique to strict midline approach with satisfactory results³. However, in this case original technique was followed and no difficulty was encountered in passing the tube through the incision. The Endo-Tracheal tube connector could be easily detached and reattached and there was no bleeding. Some complications like tube obstruction and damage to cuff (leaking) and accidental extubation are more difficult to manage in Submental Intubation. In such situation Endo-Tracheal tube exchanger has been very useful and used successfully⁴. Other complications like superficial infection of Submental wound, trauma to Sub-lingual and submandibular duct or gland, damage to lingual nerve, orocutaneous fistula, and hypertrophic scar². However no complications occurred in this patient. Perioperative antibiotic cover, good oral hygiene and not so tight closure of incision prevented infectious complications. Submental tracheal tube was kept in situ for 2 to 3 days post operatively. In such cases it is mandatory that an immediate access to oral airway is ensured at all times and maxillomandibular fixation should not be used until after extubation and confirmation of secure airway^{10, 11}. In this patient the endotracheal tube was not kept in situ as there was no airway edema. So, in selected cases with severe maxillofacial trauma, submental intubation is useful and relatively harmless alternative to tracheostomy for securing airway.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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