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Case Report

Submental endotracheal intubation: an alternative to short-term tracheostomy

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Abstract

Patients with pan facial trauma require maxillomandibular wiring in the intraoperative period to check the alignment of the fractured segments. So oral intubation is not possible in these cases. Associated nasal bone and base of skull fracture in these patients make nasal intubation unsuitable. The submental route of endotracheal intubation provides a secure airway, an unobstructed intraoral surgical field and allows maxillomandibular fixation. It is the preferred mode of intraoperative airway management in cases where maxillomandibular fixation is required but the non-invasive methods of airway management are contraindicated.

Key words: Intermaxillary fixation, Maxillofacial trauma, Submental intubation

Introduction

Airway management is very challenging in patients with maxillofacial trauma. Surgical reconstruction often requires intermaxillary fixation (IMF) in the intraoperative period to restore patient's dental occlusion which precludes oral endotracheal intubation. The submental route of endotracheal intubation was first described by Altemir in 1986.¹ This technique involves creating an orocutaneous tunnel and diverting the proximal end of the endotracheal tube (ETT) through anterior floor of the mouth. This will provide an unobstructed surgical field. It is the preferred mode of intraoperative airway management in cases where IMF is required but the non-invasive methods of airway management are contraindicated.

Case report

A 35 yrs old male of 68 kgs with a history of road traffic accident leading to epistaxis and multiple fracture of medial wall and roof of right orbit, depressed skull fracture of right frontal bone, fracture base of skull, compound fracture right mandible (Le Fort 2) was planned for reduction of mandibular fracture with

requirement of dental occlusion in the intraoperative period.



Figure 1: 3 D scan

Pre anaesthetic evaluation revealed normal airway examination of Mallampati class 2, mouth opening

3 fingers breadth, adequate extension and flexion of neck, TMJ was freely mobile. Nasal intubation was unsuitable in this case as the patient had history of nasal bleeding and had fracture nasal bones and base of skull. Examination revealed inadequate retromolar space for the endotracheal tube (ETT) to be secured in that space.

After standard orotracheal intubation, painting and draping of chin and anterior part of neck was done following which 4ml of 2% Lignocaine with adrenaline was locally infiltrated. A 1.5 cm transverse skin incision was made in the medial region of submental area, 2 cm behind the mental symphysis and parallel to lower border of mandible. A passage was created in the floor of mouth which was further widened with a curved artery forceps by blunt dissection of the muscular layers through that incision. The deflated pilot balloon of the ETT was taken out from the incision. Then the breathing circuit was disconnected and universal connector was detached from the tube. The tip of the artery forceps was introduced through the incision and the distal end of the ETT was slowly taken out from that incision. The universal connector was reattached and the ETT reconnected to the breathing circuit. There was no episode of desaturation or excessive bleeding during the whole procedure. The skin exit point of the ETT was secured to the skin using stay suture.



Figure 2: ETT coming out from the submental region



Fig 3: ETT inside the oral cavity in the floor of mouth

Intraoperatively, the endotracheal tube was away from the surgical field and the surgeons could easily do the intermaxillary fixation to check dental occlusion. At the end of surgery, submental intubation was converted to oral intubation. First the pilot balloon and then the ETT were pulled intraorally. The submental incision was closed with two skin sutures. After the patient regained full consciousness, awake extubation was done. Submental scar after 2 months was almost invisible.

Discussion

Patients with pan facial trauma require specific considerations for securing airway intraoperatively. The requirement of IMF in the intraoperative period to check for dental occlusion makes orotracheal intubation unfeasible in these cases. So the options are noninvasive methods like nasotracheal intubation, retromolar intubation or invasive methods like submental intubation and tracheostomy.

Nasotracheal intubation in a patient with fracture base of skull and cerebrospinal fluid rhinorrhea is controversial.² Any attempt towards nasotracheal intubation can lead to passage of tube into the cranium, meningitis, sinusitis and epistaxis.³ Due to unavailability of a fiberoptic bronchoscope, we did not consider this patient to be suitable for blind nasotracheal intubation.

Retromolar intubation was first described by Martinez.⁴ But it cannot be done in patients with inadequate

retromolar space. Adequacy of retromolar space can be determined by introducing the index finger in the patient's retromolar space (space behind the last upper and lower molar teeth) and asking him to close the mouth. No compression on the finger means adequate retromolar space. Retromolar intubation is only possible when there is adequate retromolar space or after extraction of the third molar. This osteotomy procedure involves destruction of bony anatomy and is associated with complications.

Tracheostomy is more invasive method having its own early complications such as hemorrhage, pneumothorax, tube obstruction, and accidental decannulation⁵ and late complications such as tracheal stenosis, tracheomalacia, tracheoinnominate-artery fistula, tracheoesophageal fistula, pneumonia.^{6, 7}

Submental endotracheal intubation is a simpler, safer and more time efficient invasive technique than tracheostomy.^{8,9,10} It avoids the need of tracheostomy and its consequent morbidity. Adverse events such as excessive bleeding, accidental extubation and arterial desaturation can occur while the endotracheal tube is passed through the incision from interior to exterior. No such problems were encountered during our procedure. This technique should be considered by the anesthesiologists in cases where an invasive technique of airway management is required for intermaxillary fixation in the intraoperative period in order to avoid tracheostomy.

Conflict of interest: None declared.

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