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Review Article

SUBMENTAL INTUBATION AS AN ALTERNATIVE TO TRADITIONAL METHODS OF GENERAL ANAESTHESIA – REVIEW

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ABSTRACT

Airway management in patients undergoing maxillofacial surgery, the surgeon needs to control the dental occlusion and nasal pyramid assessment. For these reasons, oral and nasal endotracheal intubations are contraindicated. Tracheostomy often has perioperative and postoperative complications. Submental orotracheal intubation is now a recognized method of airway control during maxillofacial surgery. It provides a secure airway and does not interfere with maxilla mandibular fixation or access to naso- orbito - ethmoid fractures.

INTRODUCTION

Airway management in patients with maxillofacial trauma is a challenge for both the anesthesiologist and the surgeon, and requires good communication between them. In most cases, the airway can be initially secured by oral endotracheal intubation. However, optimal surgical management of complex facial fractures requires temporary occlusion of the teeth and an unobstructed access to the oral cavity. At the same time, a secure patent airway must be maintained throughout the operative period (Shaji Thomas *et al,* 2012).

Various techniques of airway management have been used. In many cases, nasotracheal intubation will secure the airway without interfering with maxillomandibular fixation and the surgical approach. However, in patients with facial fracture involving the naso-orbital ethmoidal (NOE) complex, surgical reconstruction often requires switching the endotracheal tube from the nasal to oral route, which may compromise airway. Furthermore, fractures of the midface (Le Fort II or III) are frequently associated with the skull base fractures, involving the cribriform plate of the ethmoid, potentially creating a communication between the nasal cavity and the anterior cranial fossa with cerebrospinal fluid leakage. In such cases, attempts at nasotracheal intubation may lead to a major complication, i.e ., passage of the tube into the cranium. Other potential complications include meningitis, sepsis, sinusitis, and epistaxis.5 Therefore, nasotracheal intubation is considered to be relatively or even absolutely contraindicated in those patients (พัชรี มาบุญญานนท์ พ.บ, 2015) (Shaji Thomas *et al,* 2012).

An alternative technique for airway control is to perform tracheostomy, considered the method of choice by many surgeons and anesthesiologists. However, tracheostomy also carries its own morbidity. Perioperative complications include loss of airway, arterial desaturation, hemorrhage, subcutaneous emphysema, pneumomediastinum, pneumothorax, and recurrent laryngeal nerve damage, with incidences ranging from 6 to 8%. Late complications, including stomal and respiratory tract infections, tracheal stenosis, tracheoesophageal fistula, and unesthetic scar, can even reach an incidence of 60% (Shaji Thomas *et al,* 2012).

Hernandez Altemir *et al,* 1986, described an alternative method of airway management in maxillofacial trauma patients. This technique, called submental orotracheal intubation, it provides a secure airway, an unobstructed intraoral surgical field and allows maxillomandibular fixation while avoiding the drawbacks and complications of nasotracheal intubation and tracheostomy (พัชรี มาบุญญานนท์ พ.บ, 2015)

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Submental intubation was first described by Hernandez Altemir in 1986 (Altemir FH, 1986). Stoll described a similar technique to submental intubation but where the incision is placed further posteriorly in the submandibular region (Stoll P *et al*, 1994).

A study by shaji *et al* which study submental intubation permitted simultaneous reduction and fixation of all fractures and intra-operative control of the dental occlusion as well as access to the tumor mass without interference from the tube during the operation. During the procedure no additional difficulties in passing the tube through the floor of the mouth was encountered and the total duration of the procedure was less than 10 min(Fig.1) (Shaji Thomas *et al,* 2012).

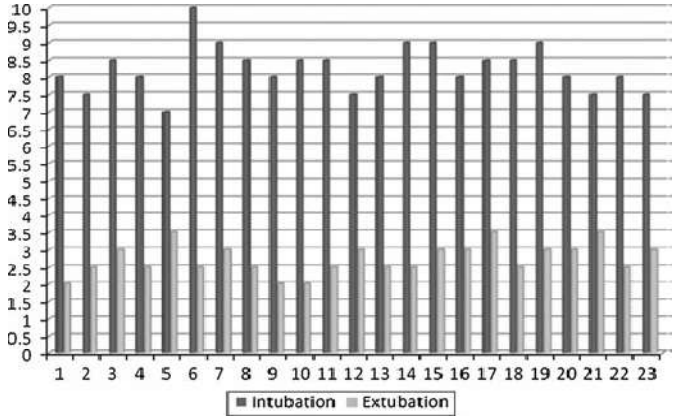

Fig 1 Distribution of time taken for intubation and extubation (Shaji Thomas *et al*, 2012)

A study published by Thai journal of Anesthesiology Submental orotracheal intubation was performed 41 times on 41 patients. In all the patients ,the submental orotracheal intubation permitted simultaneous reduction and fixation of all fractures .There were only two intra-operative complications, when the pilot balloon was leakaged and loosening of the connector after re-attachment. No postoperative complications were reported Conclusion: Submental orotracheal intubation is a simple technique associated with a low morbidity. It is an alternative to tracheostomy. For operative airway control in major maxillofacial traumas (พัชรี มาบุญญานนท์ พ.บ, 2015).

Prasant *et al* reported Submental intubation technique takes less time, is easy and risk of damage to the structures such as the submandibular glands, lingual nerve, Wharton's duct and structures of the floor of the mouth is very low (Shaji Thomas *et al,* 2012) (Caubi AF *et al,* 2016).

The risk associated with this technique includes reduced oxygen saturation during the change over from oral intubation to submental intubation and vice versa. While, passing the tube through the incision difficulty may be encountered (Gordon NC and Tolstunov L 1995).

Since the first application of this technique, less than 20 years ago, many authors have studied the clinical use of this procedure. Very low rates of complications have been reported. Many trials have shown the submental route to be a simple, quick and safe approach to airway management (Shaji Thomas *et al,* 2012).

It also avoids the risks of iatrogenic meningitis or trauma of the anterior skull base after nasotracheal intubation, as well as complications, such as tracheal stenosis, injury to cervical vessels or the thyroid gland, related to tracheotomy (พัชรี มาบุญญานนท์ พ.บ, 2015) (Shaji Thomas *et al,* 2012) (Caubi AF *et al,* 2016) (Gordon NC and Tolstunov L 1995) (Altemir FH, 1986) (Stoll P *et al*, 1994)

CONCLUSION

Submental orotracheal intubation is a useful alternative technique of airway management in patients with panfacial fractures. This technique is simple and safe to be performed with a very low morbidity and complication rate. It allows checking the dental occlusion perioperatively and concomitant surgery of the nasal pyramid in major maxillofacial traumas. It also avoids the potential complications associated with nasotracheal intubation and tracheostomy. Thus, when possible, this method of airway management should be used for patients experiencing panfacial fractures.

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