Sub-mental Intubation in Oral and Maxillofacial Trauma Patients

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Abstract Oral and maxillofacial surgical procedures present a unique set of problems for both the surgeon and the anesthesiologist as achieving dental occlusion is one of the most important aims of the treatment. Sub-mental intubation is a reliable and safe method of alternative airway management in maxillofacial surgery. This article presents the technique of sub-mental intubation along with a brief comparison with other techniques.

Keywords Oral and maxillofacial · Trauma · Submental · Intubation · Tracheostomy

Introduction

The type of intubation to be done in a maxillofacial trauma case depends on the fracture location, number, type and the need for reconstructions. For fractures that do not involve occlusion, such as nasal, zygoma, naso-orbito-ethmoidal, etc., oral intubation is indicated while for fractures that involve occlusion, such as mandibular and Lefort fractures, nasal intubation is indicated as oral intubation would interfere with occlusion. However, under certain circumstances, such as persistent cerebrospinal fluid leakage and panfacial fractures where the surgeon needs to evaluate occlusion during surgery, nasotracheal intubation is not recommended and it is in these cases that sub-mental intubation is indicated [1].

Technique

Under general anesthesia, oro-tracheal intubation is done and a throat pack is placed. After the administration of 2 % lidocaine, a mediolateral midline incision is made at a position 1.5–2 cm behind the mandibular lower border in the sub-mental region (Fig. 1). A thin beaked curved hemostat is introduced through the incision, and dissection is done toward the oral cavity (Fig. 2). Blunt dissection is performed through the platysma, deep fascia, myelohyoid and the floor of the mouth. The entrance point into the oral cavity is in the midline between the sublingual caruncle and the medial mandibular border. The anterior belly of the digastric and geniohyoid muscles is retracted. The patient is ventilated with 100 % oxygen before taking out connector from the tube then the deflated pilot tube cuff is held with artery forceps and taken out through the sub-mental incision. The tip of the artery forceps is quickly re-inserted through the sub-mental incision to grasp the tracheal tube end and taken out through the same incision. Now, the tube instead of coming through the oral cavity, it is coming a through sub-mental incision (Fig. 3). Connector is reattached and patient is ventilated through a breathing circuit. The anesthetic tube is fixed by a 2–0 silk suture to the sub-mental skin to prevent tube dislodgement. At the end of the procedure, the anesthetic tube is returned to the mouth and the sub-mental skin then sutured. The intraoral floor of the mouth exit point usually does not require suturing. It is possible to retain the sub-mental tube for as long as 48 h after the procedure [2–5].

Discussion

The sub-mental intubation consists of pulling the free end of an endotracheal tube through a sub-mental incision, after a

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Fig. 1 Midline incision is made at a position 1.5–2 cm behind the mandibular lower border in the sub-mental region

Fig. 2 A curved hemostat is introduced through the incision and dissection is done toward the oral cavity and tracheal tube is taken out through the incision

usual orotracheal intubation has been performed. The technique was introduced by Hernandez Altemir in 1986. Sub-mental intubation is very useful in panfacial maxillofacial trauma patients where it may be used instead of tracheotomy unless it is necessary to support the airway for a prolonged period. The resulting scar formation was minimal and easily hidden in the sub-mental crease. When a nasotracheal or orotracheal intubation is unsuitable in managing severe facial

Fig. 3 Tube exiting the sub-mental incision

Table 1 A comparison of different techniques of airway access in maxillofacial injury

Intubation technique	Indications	Contraindications	Advantages	Disadvantages	Possible complications
Orotacheal	All fractures not involving occlusion Emergency airway	Restricted mouth opening Upper airway obstruction	Fast procedure Avoids nasal trauma Nonsurgical technique Conventional	Intermaxillary fixation not possible Interferes with surgical field	Airway injury Bleeding
Nasotracheal	Limited mouth opening Surgeries not requiring nasal correction	Anatomical nasal abnormalities Trauma with CSF Rhinorrhea	Nonsurgical Allows occlusion maintenance during surgery	Cannot be used for surgeries requiring nasal correction	Inflammation, injury or trauma to nasal mucosa Epistaxis
Tracheostomy	Emergency airway Prolonged postoperative airway maintenance	Localized infection Anatomical abnormalities	Long term maintenance of airway Avoids nasal trauma	Surgical technique requiring expertise Requires special maintenance	Bleeding Postoperative scar Infection Surgical emphysema Tracheal stenosis
Sub-mental	Any type of maxillofacial surgery	Local infection Prolonged postoperative airway maintenance Tendency for keloid formation	Aesthetic scar Good surgical access Permits occlusion maintenance Specialized post operative care not required Avoids nasal trauma Easy procedure Less traumatic Noninvasive	Can be used for short duration Not feasible for patients requiring repeated surgeries	Bleeding Infection Scar Fistula formation
Retromolar	Any type of maxillofacial surgery	Limited retromolar space Need for prolonged postoperative airway control		Partially interferes with maxillofacial surgical procedures	Mucosal trauma Long buccal nerve palsy

injuries, a tracheostomy has long been the airway of choice. This is still the case when postoperative MMF is required in a patient with a head injury and in patients who require intubation for an extended period. However, a tracheostomy is usually not required in patients once the MMF is removed intraoperatively and is not the best option if simpler techniques are available that have a lower complication rate. Patients who receive a tracheostomy are left with a scar in an often obvious location, which can be depressed or hypertrophic. The potential complications associated with a tracheostomy include loss of airway, haemorrhage, surgical emphysema, pneumomediastinum, pneumothorax or recurrent laryngeal nerve damage. These complications usually rare are completely eliminated with the use of sub-mental intubation. However, possible complications of this technique include ranula formation, hypertrophic scarring, orocutaneous fistula, lingual nerve injury, bleeding, hematoma and infection. Retromolar intubation has been described as an alternative to sub-mental intubation. Retromolar intubation is a safe technique being noninvasive. This technique is easy to perform, nontraumatic and less time-consuming and optimal intra-operative dental occlusion can be achieved. Limited retromolar space is the only disadvantage of this technique [1–5].

A comparison of different techniques of airway access in maxillofacial injury is presented in Table 1.

Conclusion

Sub-mental intubation is a reliable and safe method of alternative airway management in maxillofacial surgery. This technique is simple, safe and quick to perform. The incidence of complications is very low as compared to tracheostomy. This technique should be considered by both the anesthetists and the surgeons in challenging cases, where an alternative technique is required.

Conflict of Interest None

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