



RESEARCH ARTICLE

SUBMENTAL INTUBATION: A USEFUL ALTERNATIVE FOR FACIAL TRAUMA SURGERY. CASE REPORT

^{1,*}Denise Yuliana Vázquez Bautista, ²Lourdes Trinidad Castillo García and ³Norma Elizabeth Carrillo Molina

¹Anesthesiologist, Department of Anesthesiology, American British Cowdray Medical Center, Mexico

²Anesthesiologist, Pain medicine, Department of Anesthesiology, American British Cowdray Medical Center, Mexico

³Anesthesiologist, Critical care, Department of Anesthesiology, American British Cowdray Medical Center, Mexico

ARTICLE INFO

Article History:

Received 15th April, 2019

Received in revised form

19th May, 2019

Accepted 28th June, 2019

Published online 31st July, 2019

Keywords:

Submental Intubation,

Le Fort Fracture,

Airway Management.

*Corresponding author:

Denise Yuliana Vázquez Bautista

ABSTRACT

The management of Le Fort-type fractures, their surgical repair and the management of the airway are a challenge for the surgeon and the anesthesiologist. Although orotracheal intubation is the most frequently used route in securing airway, it interferes with the surgical field, as an alternative nasotracheal intubation is commonly used. However, nasotracheal intubation is contraindicated in cases of skull-base trauma, therefore the tracheostomy is a good route for securing the airway, nevertheless, this procedure is associated with various complications. In 1986 submental intubation was described for the first time, since then it has been used as an attractive option in the control of the airway management for this type of situations. We present the case of a patient with multiple fractures of the maxillofacial complex, in whom tracheostomy was avoided and the submental intubation technique was chosen.

INTRODUCTION

The incidence of facial fractures is higher in men between 16 and 40 years of age. Among them, the most affected region is the mandible, followed by orbitozygomatics and maxillary fractures (Hernandez, 1986). The most commonly used classification for maxillary fractures is that of the French René Le Fort (1901), which distinguishes three types: Le Fort I or horizontal, Le Fort II or pyramidal, Le Fort III or craniomaxillary disjunction (Meyer, 2003). In 1986, Manson added a fourth type: Le Fort IV, when the fracture affects the frontal region. Treatment should be started as soon as possible, taking into account Müller's classification of fractures (AO): anatomical reduction, stable internal fixation, atraumatic surgical technique and early mobilization (Caubi 2008). Titanium miniplates have been of great benefit for the treatment of Facial fractures, because they allow better aesthetic and functional results. Surgical procedures that occupy the oral cavity may be hampered by the presence of the orotracheal tube. Nasal intubation allows an adequate approach, however, there are certain conditions that contraindicate its use. In 1986, Hernández Altemir described the technique of submental intubation as an alternative to classical methods (Nyárády, 2006). The technique consists of passing the endotracheal tube through the anterior floor of the mouth, which allows free access to the surgical field and nasal pyramid, without endangering patients with trauma to the base of the skull (Sepúlveda Voullieme, 2008). Submental intubation allows an adequate surgical approach and is a simple, fast and safe alternative associated with low morbidity

rates compared to tracheostomy. Different studies have been carried out since the description of the technique in 1986. These studies report that there is no motor or sensory deficit, in addition to an adequate mucosal healing, as well as to preserve the salivary ducts and their production (Figueiredo Caubi, 2008).

Clinical Case: A 51-year-old male patient with the following important antecedents: Infantile Cerebral Palsy (ICP) and neonatal hypoxia epilepsy. In treatment with Keppra (Levetiracetam), Epival (Valproic Acid) and Topamax (Topiramate). He presented a week prior to his admission falling from his own height, with mild cranioencephalic traumatism and facial trauma. Prior to admission, she went to the emergency department of another institution where face suturing was performed. Later he went to another institution where antimicrobial therapy and anti-edema management was started, it was evaluated by neurology, orthopedics and ophthalmology. Axial computed tomography (CT) was performed, which evidenced findings compatible with Le Fort III fractures on the right and left II. It was programmed for surgical reduction of said fractures. Preoperative assessment was performed: Physical state ASA III, high thromboembolic risk, airway: Mallampati III, oral opening of 3 cm, Patil Aldreti II, Bellhouse Dore I, mandibular protrusion I. He entered the operating room. Type II monitoring with non-invasive blood pressure, electrocardiogram (DII V5), pulse oximetry, plethysmography, capnography, hourly uresis and arterial blood gases. Baseline vital signs: Blood pressure 140/90 mm Hg, heart rate 62 beats per minute, respiratory rate of 21

breaths per minute, peripheral oxygen saturation (SpO₂) of 98%. Subsequently, pre oxygenation and denitrogenation with face mask and supplemental oxygen 8 L / min for 3 minutes with inspired fraction of oxygen (FiO₂) at 100%. Intravenous induction with Fentanyl 200 µ, Propofol 80 mg, Cisatracurium 10 mg. Direct laryngoscopy with Macintosh sheet 3, Cormack Lehane 1 was performed, endotracheal tube (ETT) number 8.0 was introduced, pneumatic tamponade with 5 ml of air. Eye, thermal and bony prominences were placed. Maintenance with Sevoflurane, Fentanyl boluses, crystalloid solutions, mechanical ventilation controlled by volume. Subsequently, intra-oral asepsis and antisepsis was performed in the lower jaw area. 2% lidocaine was infiltrated with epinephrine and an incision of 1.5 cm and 2 cm lateral to the midline was made in the submandibular region. The submandibular fatty tissue, platysma muscle, mylohyoid and oral mucosa were dissected using Kelly forceps. The EET connector was removed and gauze was placed to protect the tube light. Once the oral cavity was reached, the forceps were introduced to allow the passage of the tube through the orifice formed (Figure 1). The connector was recoloured and connected to the anesthetic circuit to continue mechanical ventilation in established parameters. Pulmonary fields were auscultated and the tube was fixed with suture. At the conclusion of the surgical act, sutures were removed around the endotracheal tube, and this was returned through the hole to the oral cavity. The skin was sutured with simple stitches and the closure of the oral incision was made by second intention. The anesthetic emersion was by metabolic lysis of drugs, with adequate ventilatory automatism and after aspiration of secretions, EET was withdrawn and passed to the recovery area for immediate postoperative monitoring. Continuous postoperative management in the intermediate care unit for continuous monitoring and close monitoring.

Table 1. Benefits of submental intubation

1	Early extubation after operation.
2	Avoiding the cumbersome task of post-operative tracheostomy tube care.
3	Avoidance of possible known complications of tracheostomy tube



DISCUSSION

The submental intubation was described as a simple and safe technique, which allows access to the oral and nasal cavity, especially in those patients with a fracture in the anterior base of the skull, or those that require reduction of fractures with adequate intermaxillary fixation. Being an effective procedure in the management of the airway in cases of maxillofacial trauma, which has allowed to avoid the risk of epistaxis, meningitis and / or trauma, as well as complications related to the tracheostomy such as hemorrhage, pneumomediastinum, obstruction of the cannula, cellulitis, tracheal stenosis, damage to the cervical vessels, thyroid gland, subcutaneous emphysema, pulmonary atelectasis, tracheoesophageal fistula,

tracheocutaneous fistula, pneumothorax, dysphagia, decannulation problems or damage to the recurrent laryngeal nerve (Caubi, 2008; Lobo Leandro et al., 2015; Eisemann et al., 2014). The submental approach has been used in order to avoid tracheostomy in patients who do not have an indication for it, as previously mentioned, there are documented risks in relation to it. The submental intubation does not involve considerable risks, the intubation time ranges from 7 to 10 minutes (Mahmood, 2002; Faraj et al., 2013).

Despite being a good option in the management of patients with multiple fractures in the maxillofacial region, it is not free of complications, the most important ones include damage to the tube balloon, submental infection, abscess formation in the floor of the mouth, injury to the salivary gland duct, mucocele formation, injury to the marginal branch of the facial nerve, injury to facial vessels, keloid or hypertrophic wounds.¹¹ Although the incision made often produces a scar less visible and It has been adequately tolerated by patients.²(Table 1). This technique was described since 1986, which has presented discrete modifications over time in different prospective studies, leading to lower risk, complications and income to intensive therapy, secondary to the prompt extubation of patients and the better visualization of the surgical field.

Conclusion

Submental intubation offers a minimally invasive alternative, adequate and easy for polytraumatized patients with affection at the facial level, a technique that allows an adequate reduction and fixation of the fractured segments, since it does not interfere in the surgical field. Being a reliable alternative to tracheostomy in patients with complex maxillofacial fractures that do not require prolonged ventilatory support. It has minimal comorbidity, lower complication rate and avoids potential complications related to the tracheostomy. The authors declare no conflict of interest. Funding Support information in MEDLINE/PubMed

REFERENCES

- Caubi, A. F., Vasconcelos, B.C.D.E., Vasconcellos, R. J. D. H., De Moraes, H. H. A. and Rocha, N. S. 2008. "Submental intubation in oral maxillofacial surgery: review of the literature and analysis of 13 cases," *Medicina Oral, Patologia Oral y Cirugia Bucal*, vol. 13, no. 3, pp. 197–200.
- Eisemann, B., Eisemann, M., Rizvi, M., Urata, M.M., Lypka, M.A. 2014. Defining the role for submental intubation. *J Clin Anesth*, 26, pp. 238-242
- Faraj J. AlKhalil M., Darwishb A., Fara I., El-Zenati H., Altraifi Y. et al., 2013. Submandibular intubation: our experience in Qatar and a short review of literatura. *Egypt J Ear Nose Throat Allied Sci*, 14:119-21.
- Figueiredo Caubi, A., Cavalcanti do Egitto Vasconcelos, B., de Holanda Vasconcellos, R.J., Araújo de Moraes, H.H., Studart Rocha. N. 2008. Submental intubation in oral maxillofacial surgery: review of the literature and analysis of 13 cases. *Med Oral Patol Oral Cir Bucal*, 13, pp. E19-E200
- Hernandez, A. 1986. "The submental route for endotracheal intubation," *Journal of Oral and Maxillofacial Surgery*, vol. 14, p. 645.
- Lima SM., Asprino L., Moreira RW., de Morales M. 2011. A retrospective analysis of submental intubation in

- maxillofacial trauma patients. *J Oral Maxillofac Surg.*, 69:2001-5.
- Lobo Leandro LR., García Guevara HA., Marinho K., Sánchez Rivero C., Lagunez Lópe MA. 2015. Submental Intubation: experiencia with 30 cases. *REV ESP CIR ORAL MAXILOFAC.* 37(3):132-137.
- Mahmood S., Lello G. 2002. Oral endotracheal intubation: median submental (retrogenial) approach. *J Oral Maxillofac Surg.*, 60:473-4.
- Meyer, C., Valfrey, J., Kjartansdottir, T., Wilk, A. and Barrière, P. 2003. "Indication for and technical refinements of submental intubation in oral and maxillofacial surgery," *Journal of CranioMaxillofacial Surgery*, vol. 31, no. 6, pp. 383–388.
- Nyárády, Z., Sári, F., Ólasz, L. and Nyárády, J. 2006. "Submental endotracheal intubation in concurrent orthognathic surgery: a technical note," *Journal of Cranio-Maxillofacial Surgery*, vol. 34, no. 6, pp. 362–365.
- Sepúlveda Voullieme, P., Cosmelli Maturana, R., Cifuentes Fernández, J., Reyes M. 2008. MedinaLa intubación submentoniana, otra opción en trauma oro-facial. *Rev Dent Chile*, 99, pp. 27-31
