Intubação submento-orotraqueal em fratura mandibular: Relato de caso

Submentum-orotracheal intubation in mandibular fracture: A case report

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RESUMO
A intubação submento-orotraqueal é um procedimento que consiste no repositionamento da extremidade livre de um tubo endotraqueal por meio de uma incisão submentoniana após a realização da intubação orotraqueal convencional. Essa técnica permite o acesso às estruturas faciais sem interferência do tubo oro ou nasotraqueal. Este relato teve como objetivo apresentar um caso de intubação submento-orotraqueal em paciente com fratura mandibular e necessidade de bloqueio maxilar mandibular transoperatório com impossibilidade de intubação nasotraqueal e fornecer uma breve revisão da literatura das principais indicações, limitações e complicações da técnica. A utilização da técnica SOI é simples e bastante difundida na literatura e apresenta poucas complicações em seu uso. Deve ser indicada quando os benefícios são maiores que as limitações da técnica, como em pacientes que necessitam de um longo período de ventilação assistida, ou seja, pacientes politraumatizados, apresentando graves danos neurológicos e grandes traumas torácicos e necessitando de múltiplas cirurgias a posteriori.

Palavras chave: Intubação, Cirurgia Maxilofacial, Fraturas De Crânio, Mandíbula.

ABSTRACT
Submentum-orotracheal intubation is a procedure that consists of repositioning the free end of an endotracheal tube through a submental incision after conventional orotracheal intubation has been performed. This technique allows access to facial structures without interference from the oro- or nasotracheal tube. This report aimed to present a case of Submentum-orotracheal intubation in a patient with a mandibular fracture and the need for the transoperative maxillary mandibular block with the impossibility of nasotracheal intubation and to provide a brief literature review of the main indications, limitations, and complications of the technique. The use of the SOI technique is simple and significantly disseminated in the literature and presents low complications in its use. It should be indicated when the benefits are greater than the limitations of the technique, such as in patients who need a long period of assisted ventilation, i.e., polytrauma patients, presenting severe neurological damage and major chest trauma and requiring multiple surgeries a posteriori.

Keywords: Intubation, Maxillofacial Surgery, Skull Fractures, Mandible.

1 INTRODUCTION
Submentum-orotracheal intubation (SOI) is a procedure that involves repositioning the free end of an endotracheal tube through a submental incision, after conventional orotracheal intubation has been performed, allowing the unimpeded reduction and fixation of maxillofacial fractures, thus avoiding the need for tracheostomy.

It was first described in 1986 by Altemir, with the main indication of trauma to the craniomaxillofacial complex that required maxillary mandibular block (MMB). This technique allows access to facial structures without interference from an oro or
nasotracheal tube\textsuperscript{4,5}, because for the precise functional reconstruction of facial fractures involving teeth and bone segments, intraoperative block is essential\textsuperscript{6}.

Other indications for SOI reported in the literature are orthognathic surgeries associated with rhinoplasty and septoplasty, cosmetic facial surgeries, nasal diseases, skull base tumors, extensive tumors on the face, and post-traumatic facial sequelae\textsuperscript{7}. Procedures such as tracheostomy or cricothyroidotomy may be viable alternatives for intraoperative airway management in the absence of conventional intubation; however, they are associated with a greater number of complications\textsuperscript{8}.

This article aims to report a case of SOI in a patient with a mandibular fracture who required transoperative MMB with the impossibility of nasotracheal intubation and to provide a brief literature review of the main indications, limitations, and complications of the technique. This report was written per the case report guidelines\textsuperscript{9}.

\section*{2 CASE REPORT}

A 28-year-old male patient with a history of a motorcycle accident with trauma to the face was referred to the emergency department of G.V. Hospital in Recife-PE for evaluation by the Oral and Maxillofacial Surgery and Trauma Team.

On physical examination, the main characteristics observed were edema in the lower third of the face, local pain, dental malocclusion, and mandibular mobility during palpation. Computed tomography of the face revealed bilateral mandibular fractures (Figure 1).

Fig. 1 Three-dimensional (3D) reconstruction of computed tomography showing parasympathetic mandibular fracture.
After 11 days of hospitalization, the patient was referred to the operating room to undergo reduction and fixing of the mandibular fractures under general anesthesia. However, due to an extensive deviation of the nasal septum to the left side and the failure of the passage and progression of the tube in the right nostril, nasotracheal intubation was not possible. As there was a need for MMB during surgery to maintain dental occlusion, orotracheal intubation was not indicated. Thus, the team of surgeons and anesthetists decided to perform the SOI (Figure 2).

Fig. 2 Coronal section of computed tomography showing extensive deviation of the septum to the left side.

The SOI technique was performed as follows. Initially, conventional orotracheal intubation was performed by a team of anesthesiologists; it was followed by a right submental extraoral incision approximately 2 cm parallel to the edge of the mandible and divulsion by planes with an orifice in the paramedian oral floor at the midline by the oral and maxillofacial surgeons (Figure 3).
Then, the wire tube was reversed and introduced into the hole created in the oral floor, being externalized in the face together with the cuff through the extraoral hole (submental) with the aid of Allis forceps, and the tube was fixed to the skin using 2-0 nylon sutures to prevent displacement. Both intubation and surgical procedures were performed without complications (Figure 4).

Currently, the patient has undergone a year and a half of postoperative follow-up, with stable occlusion, significant mouth opening, absence of extraoral scars, and no other complaints.
3 DISCUSSIONS

Orotracheal intubation refers to the insertion of a tracheal catheter through the mouth and glottis into the trachea. It provides the best conditions for airway permeability, oxygen supply, the suction of the respiratory tract, and anti-aspiration and plays an important role in the rescue of critical patients\(^{10}\).

The most common method of airway management in patients with oral and maxillofacial surgery and nasotracheal intubation provides good accessibility for oral surgical procedures. However, the most common complication is epistaxis, resulting from trauma to the nasal and pharyngeal mucosa, nasal septum, and turbinates\(^{11}\). Management of the airways in the presence of pan facial or midface fractures with mandibular involvement requires special consideration owing to the possibility of associated skull base fractures\(^{12}\). This type of intubation is contraindicated in these cases, mainly due to the incidence of accidental intracranial tube placement and the risk of rhinorrhea and meningitis\(^{13}\). A similar case of accidental intracranial nasogastric tube placement has been reported in the literature\(^{14}\). When the work area is the oral cavity, orotracheal intubation is generally neglected, and it is considered a risk factor for the development or exacerbation of disorders related to the temporomandibular joint\(^{15}\).

In situations in which the patient requires MMB in the transoperative period of fractures of the craniomaxillofacial complex, tracheostomy is an alternative as it allows airway control and fracture reduction with adequate occlusion\(^{16}\). However, it can involve a significant number of complications, including complex bleeding, subcutaneous or mediastinal emphysema, pneumothorax, damage to the laryngeal nerves, tracheal stenosis, tracheomalacia, tracheoesophageal fistula, wound infection, and non-esthetic scars\(^{17–19}\). Regarding cricothyroidotomy, lesions in the thyroid gland and its adjacent vessels, cardiac arrest caused by vagal nerve stimulation, post-hypercapnic shock, acute pulmonary edema, and air embolism have been documented\(^{19,20}\).

SOI is a useful technique in complex, extensive reconstructions and when MMB is needed, owing to the absence of the tube in the operative field. Its location is advantageous when congenital, pathological, post-traumatic, or post-operative facial deformities hinder orotracheal or nasotracheal intubation\(^{5,21–23}\).

The medical and physical limitations that contraindicate oro or nasotracheal intubation in to the context of tracheostomy, including polytrauma, neurological or pulmonary deficits, need for prolonged mechanical ventilation, upper airway obstruction, and mouth opening limitation, also apply to SOI\(^{24}\). Other limitations are diseases in the
submental region and a tendency to form keloids. In general, SOI has precise applications in carefully selected patients; however, understanding its indications is crucial for treatment decisions⁷. In the present case, there was an extensive deviation of the nasal septum to the left side, in addition to the attempt to pass the tube through the right nostril. Therefore, nasotracheal intubation was not possible. As there was a need for MMB during the operation to maintain dental occlusion due to mandibular fracture, SOI was chosen.

Some transoperative complications have been reported in the literature, including damage or displacement of the tube, extubation accidents, bleeding, and difficulty in performing the technique. Postoperative complications include local infection, hypertrophic scarring, fistula, mucocele, bruising, motor and/or sensory deficit, and dehiscence of the extraoral sutures⁷.

In general, there must be a balance between the inconvenience of extraoral scarring and the benefits of accessing and performing procedures without having to change the tube²⁵,²⁶. In other words, SOI should be indicated only when the benefits outweigh the limitations of the technique. In the present case, there were no trans- or postoperative complications, only a slight extraoral scar, thereby proving SOI to be an effective and safe intubation technique.

4 CONCLUSION

The SOI technique is simple and significantly disseminated in the literature and presents low complications. It should be indicated when its benefits are greater than its limitations, such as in patients who need a long period of assisted ventilation, i.e., patients with polytrauma presenting severe neurological damage and major chest trauma and requiring multiple surgeries a posteriori.

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