

LETTER TO THE EDITOR

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Anatomical approach to submental intubation through a paramedian transcervicular approach

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Abstract

Submental intubation has been established as a useful technique in securing the airway and is also less invasive as compared to a tracheostomy. This approach is especially useful in cases of fractures involving the naso-orbito-ethmoid complex, where a nasotracheal intubation would be contraindicated. Also, in case of orthognathic surgeries, where occlusion is considered to be the key to success, an orotracheal intubation could hinder the surgical procedure. In this technical note, we have described a modified submental intubation technique that is less invasive and at the same time facilitates successful airway management, thus reducing postoperative complications.

Keyword Submental intubation; Paramedian route; Naso-orbito-ethmoid complex fracture; Orthognathic surgery

Background

Submental intubation is a well-accepted option for intraoperative airway management. During orthognathic surgery, surgeons require ample access to the nasal region, whereas in patients with mid-facial trauma involving naso-orbito-ethmoid complex, nasotracheal intubation is a relative contraindication. In such cases, submental intubation is a viable option, which enables surgeons to have greater control over occlusion and nasal esthetics. During orthognathic surgery, it also eliminates deviation of nasal septum and improves nasal breathing outcomes in patients with obstructive sleep apnea [1]. Another advantage is the ability to avoid tracheostomy and its complications [2]. Other indications include oronasal fistula, intranasal pathology, maxillary sinus cyst, obstructive tumours, and patients with history of nasal bleeding or CSF leak [3]. In this letter, a modification of the

conventional submental intubation technique has been described.

Main text

In the proposed technique, a 2 cm incision is placed 2 cm from the midline in the para median region within the shadow of the mandibular lower border (Fig. 1). Incision is extended down to the platysma. The platysma is then detached at its insertion to the lower border of mandible (Fig. 2). After exposure of the lower border of the mandible, sub-periosteal dissection is carried out medial to the mandible till the mylohyoid attachment. The insertion of the mylohyoid up to the mylohyoid line is detached using electro-cautery.

Intra-oral crevicular incision is then placed in relation to canine and premolar (Figs. 3 and 4), and muco-periosteal flap is raised to connect with the extra-oral incision, thus facilitating an unhindered passage of the endotracheal tube (Figs. 5 and Fig. 6).

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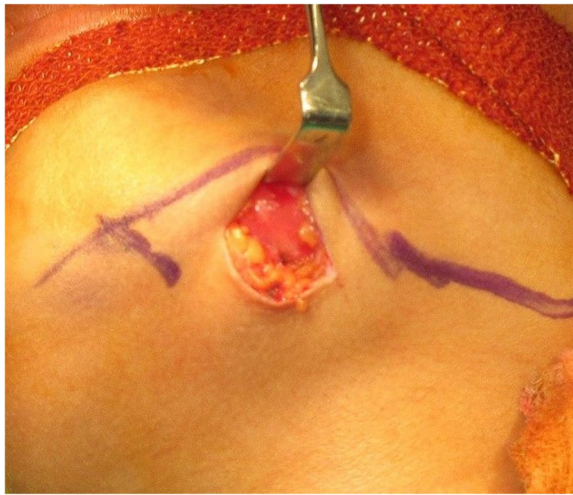


Fig. 1 Paramedian incision placed 2 cm away from the lower border of mandible

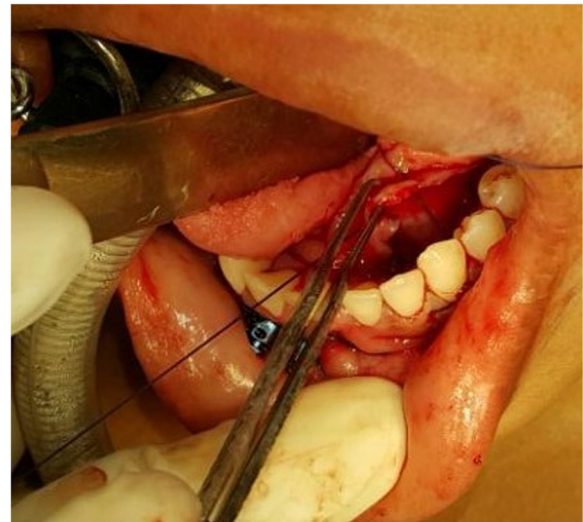


Fig. 3 Intra-oral transcrevicular incision placed in the region of canine-premolar, taking care not to injure the Wharton's duct and without violating the floor of the mouth

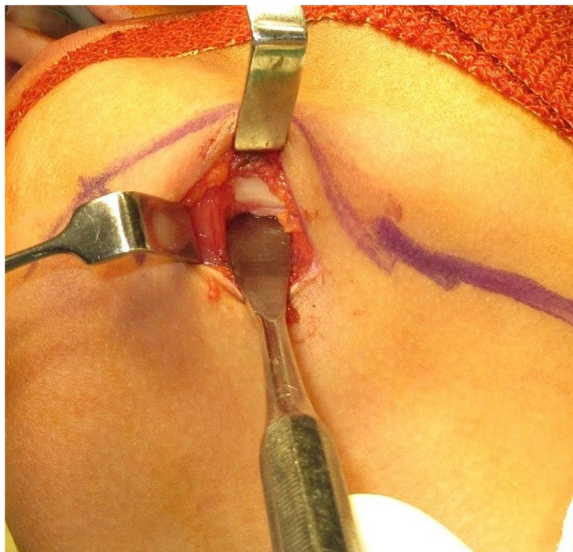


Fig. 2 Identification of platysmal attachment to mandible

There are several variations in sequence, route and tube passage while performing a submental intubation. In terms of sequence, some variations are the Altemir sequence [4] and the Green and Moore sequence [5]. In terms of route, the submental

(median) and submandibular (paramedian) routes can be compared with their own set of advantages and disadvantages.

Submental route avoids trauma to the lingual nerve, submandibular duct, and sublingual gland. It also avoids sublingual hematoma and edema [6]. The disadvantage of the submental route is that it interferes with the attachment of the genioglossus and geniohyoid muscles and, if not carefully performed, injury to the Wharton ducts can occur. Injury to the mandibular lingual perforating vessels (present in the midline in 98% of instances) could lead to bleeding [7].

The proposed technique is different from the original Altemir technique, in that no dissection through the platysma and mylohyoid muscles is involved, that is, a trans-mylohyoid dissection is avoided. Both the platysma and mylohyoid muscles are detached from the insertion to the mandible, thus reducing the chances of intraoperative blood loss, hematoma and edema. Also, the crevicular incision used in this technique avoids placing an incision in the floor of the mouth as compared to the conventional sublingual lateral sulcus incision. This in turn reduces the chances of mucocele, sublingual gland damage, submandibular duct injury and lingual nerve injury.

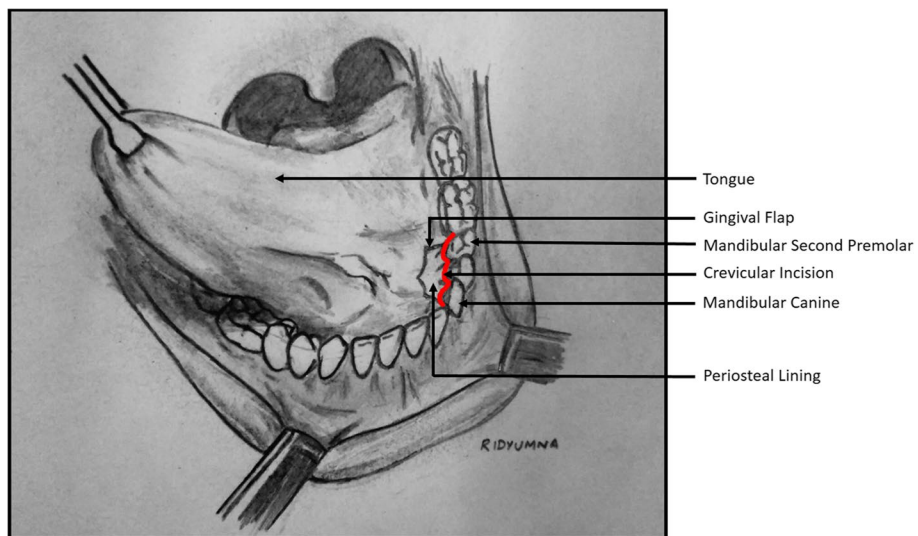


Fig. 4 Sketch demonstrating intra-oral transcrevicular incision placed in the region of canine-premolar without violating the floor of the mouth

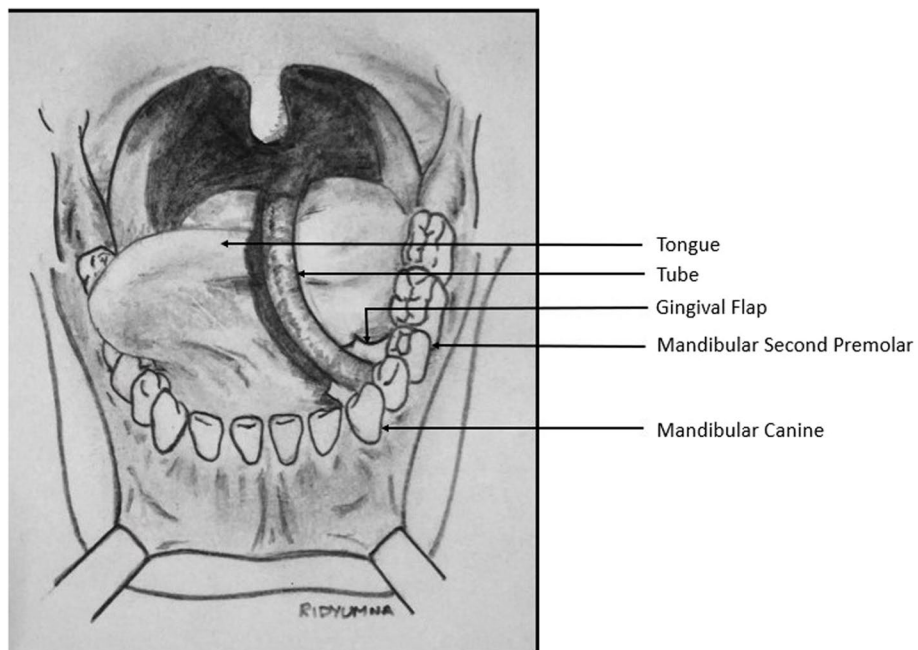


Fig. 5 Sketch demonstrating intra-oral transcrevicular incision and passage of endotracheal tube through the incision

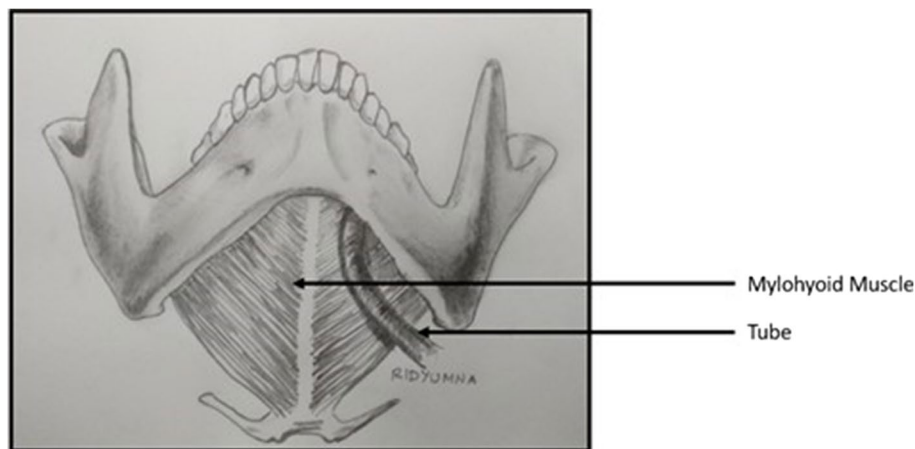


Fig. 6 Sketch demonstrating endotracheal tube passing through the attachment between the mylohyoid muscle and the medial surface of the mandible without penetrating the muscle

Conclusion

The modified submental intubation technique is less invasive and at the same time facilitates successful airway management, thus reducing postoperative complications.

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Authors' contributions

AK and EMV performed the surgical procedures constructed the framework of this article. MS was the major contributor in writing the manuscript. CA and SR contributed to writing the manuscript and photograph assimilation. All authors have read and approved the manuscript.

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Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

All procedures were in accordance with the ethical standards of the institutional ethics committee (IEC, KMC Manipal) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent for publication

Written informed consent was obtained from the patient.

Competing interests

The authors declare that they have no competing interests.

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