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Submental / Transmylohyoid intubation in maxillofacial surgery: Report of two cases

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Abstract

The submental / transmylohyoid intubation technique, as an alternative technique of airway management in oral and maxillofacial surgery, and its modifications, have been widely reported in the literature since it was first described by Altemir in 1986. However, the technique is not yet popular in Nigeria and Africa in general. A report of two cases in which this technique was used in orofacial reconstruction is presented here. The surgical / anesthetic outcome was satisfactory. No complication was seen in the two cases, and healing of the submental wound was uneventful. Submental intubation is a reliable technique of alternative airway management in oral and maxillofacial surgery. The submental / transmylohyoid technique should be considered by both the anesthetist and the maxillofacial surgeon in challenging cases, where an alternative airway technique is required for maxillofacial surgery.

Key words: Intubation, submental, technique

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Introduction

Oral and maxillofacial surgical procedures present a unique set of problems both for the surgeon and the anesthetist.^[1,2] Achieving dental occlusion is one of the fundamental aims of most oromaxillofacial procedures. Oral intubation precludes this surgical prerequisite of checking dental occlusion. In other instances, oral intubation is a nuisance in some procedures in oromaxillofacial surgery and skull base surgery.^[1-4] Nasotracheal intubation is contraindicated in nasal fractures, midfacial fractures and panfacial fractures, and other pathologies involving the nose.^[3,4] Conventional tracheostomy, as an alternative method of airway management in maxillofacial surgery, has many inherent complications.^[5-7]

The technique of submental / transmylohyoid intubation as an alternative airway to orotracheal / nasotracheal intubations and tracheostomy was first described by Altemir in 1986.^[8] The technique consisted of diverting the proximal end of an orotracheal tube through the floor of the mouth and

submental region.^[9] Since 1986, the technique has undergone various modifications and found new indications.^[2-4]

The use of this intubation technique in oral and maxillofacial surgery has not been reported in Nigeria. A report of two cases in which this technique was used in orofacial reconstruction is presented.

Case Reports

Case 1

A 22-year-old man was planned for surgical closure of an oronasal fistula [Figure 1a] with a tongue flap, under general anesthesia. Nasotracheal intubation was not possible due to a lack of patency of the nasal cavity, as a result of previous surgical reconstruction of a nasal defect [Figure 1b]. Orotracheal intubation was also avoided due to the fact that there would be a need to place a maxilla-mandibular fixation after the tongue flap placement, to prevent excessive mobility

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Figure 1a: Oronasal fistula in a 22-year-old man



Figure 1b: Frontal view of patient in 1a with complete obliteration of the nostrils



Figure 1c: Securing of airway was done by orotracheal intubation



Figure 1d: Submental intubation (paramedian) in place before surgical repair



Figure 1e: Submental surgical wound before suture removal

of the tongue during healing. The submental intubation technique rather than tracheostomy was opted for, after discussion with the anesthetist.

Submental technique

The airway was secured through orotracheal intubation [Figure 1c]. A 2 cm long skin incision was made midway between the angle of the mandible and the symphysis, just medial to the lower border of the mandible (paramedian incision). With blunt dissection, an orocutaneous connection (extra-periosteal) large enough to allow the passage of the endotracheal tube was created. A hemostat was introduced into the oral cavity through the skin incision; the endotracheal tube was disconnected from the anesthesia machine and the open end of the tube was covered with a nylon tube sac, which was held with the hemostat, and pulled through the wound extraorally while securing the tube, to prevent accidental extubation. The tube was then secured in place with sutures [Figure 1d]. The procedure was successfully carried out, and extubation (done immediately after surgery) through the submental route was uneventful. Healing of the

submental wound was uneventful [Figure 1e]. No postoperative complication was seen.

Case 2

A 10-year old boy presented with post cancrum oris defects affecting the left side of his upper lip, floor of the nose, and commissure [Figure 2a]. The associated defects included collapse of the right and left alae of the nose. The patient was planned for surgical reconstruction of the defects under general anesthesia. Nasotracheal intubation was not possible due to collapse of the alae of the nose, and orotracheal intubation was also jettisoned, due to the possibility of disruption of the surgical wound during recovery and extubation. The submental intubation technique rather than tracheostomy was opted for after discussion with the anesthetist. The procedure was successfully carried out using the submental intubation technique [Figure 2b]. The procedure was essentially the same as that of Case 1, except that a midline rather than paramedian incision was made [Figure 2c]. Extubation was done immediately after surgery. No postoperative complication associated with submental technique was recorded.

Discussion

The technique of submental intubation was first described by Altemir in 1986.^[1] Indications for submental intubation included midfacial and panfacial fractures, with skull base involvement, orthognathic surgery, facial aesthetic surgery, and rhinoplasty.^[5-7] In the present case series, the reason for preference of the submental technique in the first case was that there would be a need to place a maxillomandibular fixation after the tongue flap placement, to prevent excessive mobility of the tongue during healing. This would not have been possible intraoperatively if the orotracheal intubation technique was used. Collapse of the alae of the nose (difficult nasal intubation), and the possibility of disruption of the surgical wound by the orotracheal tube during recovery and extubation, were the reasons for the choice of submental intubation in the second case.

The technique of submental intubation was found to be a suitable alternative in both cases. The alternative technique in these cases would have been tracheostomy. An advantage of submental intubation over tracheostomy was the fact that extubation was done immediately after the operation, avoiding the stress of care for the *in-situ* tracheostomy tube during the postoperative period. With this technique other possible complications of tracheostomy were avoided. The possible complications included: tracheal stenosis, internal emphysema, damage to the laryngeal nerves, tracheoesophageal fistula, and scarring.^[5-7]

The submental route for endotracheal intubation represents a fast and low-morbidity alternative to tracheostomy.^[10] The submental intubation procedure requires no more than five minutes to perform.^[10] The technique is very easy, and the



Figure 2a: A 10-year-old boy with orofacial defects due to cancrum oris



Figure 2b: Submental intubation (midline) in place



Figure 2c: Suturing of submental incision wound after successful extubation

risk of damage to structures such as the sublingual and submaxillary glands, Wharton's duct, and the lingual nerve is very low.^[11] In fact, these major complications have never been

reported.^[11] Attention to the technical details of the technique and careful blunt dissection close to the medial border of the mandible and a good knowledge of the anatomy can help avoid damage to the structures of the floor of the mouth.^[11]

There are many modifications to the original technique described by Altemier regarding the placement of the skin incision.^[8,10,12] The skin incision can be placed midway between the angle of the mandible and the symphysis and just medial to the lower border of the mandible or one-third of the way from the symphysis to the angle of the mandible (paramedian incision) or in the midline region behind the lower border of the mandible (midline incision).^[4,10,12] In the present series, the incision was placed midway between the angle of the mandible and the symphysis in the first case, whereas, in the second case, the incision was placed in the midline region, behind the lower border of the mandible. Risks to the lingual nerve, submandibular duct, sublingual gland, and submental vessels were possible with the paramedian incision; therefore, the need to stay close to the lingual surface of the mandible, in order to avoid damaging these structures, has been suggested.^[12] Excessive bleeding that may be encountered with the paramedian incision is usually avoided with the midline incision.^[12] The relatively avascular plane between the two bellies of mylohyoid and the anterior bellies of the digastric has been suggested as another advantage of the midline technique.^[13] The midline incision heals imperceptibly and is therefore suggested to be cosmetically superior.^[14]

Although, this technique is termed and known as the submental intubation technique, some authors have suggested that the terminology transmylohyoid intubation seems more appropriate to use than submental intubation, as the passage of the tube is through the mylohyoid muscle.^[15,16] The term 'transmylohyoid' denotes that the incision can be made anywhere from the first mandibular molar on one side to the first mandibular molar on the other side.^[15,16]

Altemir in his original report suggested the creation of the subperiosteal passage for the tube in the lingual surface of the mandible.^[8] However; others have suggested an extraperiosteal approach for the passage of the tube.^[11] The extraperiosteal approach was employed in the two cases in this series.

It has been suggested that the tube be tightly secured after exteriorisation, to avoid accidental extubation.^[13] In the present series, the tubes were firmly secured in place with a 1 / 0 silk suture. In addition, after normal orotracheal intubation, the tube had to be firmly secured intraorally to prevent accidental extubation during the submental procedure.

Submental intubation is contraindicated where more long-term control of the airway is required, for example, gun shot injuries.^[12-14] Other possible contraindications are infection at the site of the incision and bleeding diathesis.^[12-14]

No complication was recorded in the two cases presented.

No episode of accidental extubation, leaking cuff, submental orotracheal fistulae or anomalous scars was seen in the two cases. Complications after submental intubation were rare.^[10-12] These could include submental infection, orotracheal fistula, accidental extubation, and submental scarring.^[11,13] Sharma *et al*,^[13] reported a complication rate of 10% in a series 20 patients who underwent submental intubation. These included wound infection and partial extubation.^[13] Nyarady *et al*,^[17] reported no complication in a series of 13 patients who underwent submental intubation for orthognathic surgery.

Conclusions

Submental intubation is a reliable method of alternative airway management in oral and maxillofacial surgery. The technique demands a surgical skill, but it is simple, safe and quick to perform. The technique presents a low incidence of operative and postoperative complications and eliminates the risks and side effects of tracheostomy. This technique should be considered by both the anesthetist and the maxillofacial surgeon in challenging cases, where an alternative airway technique is required, in maxillofacial surgery.

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