Submental Intubation for Maxillofacial Surgery

-A Case Report-

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Abstract

Endotracheal intubation through the floor of the mouth was first described by Hernandez Altemir in 1986 (Altemir, 1986). Since then there have been several articles in the literature describing and modifying the technique (Stoll et al, 1993; Prochno et al, 1996). This method allows temporary intermaxillary fixation to achieve optimal occlusion and avoids interference of the endotracheal tube during the repair of the midface (Paetkau, 2000; Adamo, 1996; Katsnelson, 1994). And in the case of nasal intubation interfering with centralization and stabilization of nasal fractures or of the possibility of basal skull fracture, this technique is more useful than tracheotomies that result in a number of potential complications with esthetically poor scarring in a highly visible anterior neck.

This paper would be like to introduce the case of multiple skull base fracture patient, and also to review...
the advantage, disadvantage and the procedures of the submental intubation.

**Case Report**

A 28-yr-old man in an automobile accident with multiple maxillofacial injuries, cerebral concussion and cervical spine fractures was delivered at the emergency department at the Regensburg University Hospital in Germany (Fig. 1). At first, he had been orally intubated shortly after arrival at the emergency department and his lungs were ventilated.

He was scheduled for repair of the maxillofacial fractures and, because intermaxillary fixation was needed with nasal bone reduction, he would be decided with a submental approach for endotracheal intubation. After general anesthesia, the another tube was repositioned via submental route (Fig. 2) with reinforced tube (Rush, Kemen-Rommelshausen Co., Germany).

After submental intubation, nasal bone fracture with ecchymosis was corrected at the same time (Fig. 3).

**Discussion**

The endotracheal intubation is necessary for the
routine procedures in oral and maxillofacial surgery, and the various methods have been used as surgical intubation; preoxygenation, awake intubation, rapid sequence intubation, retrograde intubation, nasal intubation and submental intubation.

In the craniomaxillofacial trauma with basal skull fracture or panfacial fracture or severe facial bony deformities secondary to beta-thalassaemia major, multiple complications with a tracheostomy can be prevented by using the submental intubation (Mak and Ooi, 2002).

Extensive facial trauma surgery frequently requires intermaxillary fixation. In situations in which intermaxillary fixation is required and nasoendotracheal intubation is contraindicated, a cricothyrotomy or tracheostomy has been the traditional method of airway control. But additional surgery and potential complications associated with either a cricothyrotomy or tracheostomy would be happened as follows; formation of aesthetically poor scarring, thyroid isthmus bleeding, tracheotomy tube displacement, passage error, pneumothorax or pneumomediastinum formation, tracheocutaneous fistula or tracheal stenosis formation and subglottic larynx damages (Fig. 4). Temporary intermaxillary fixation with optimal occlusion is possible with submental intubation and the interference of the endotrachial tube during the midface repair is also advantages of submental intubation (Stranc and Skoracki, 2001).

But the disadvantages are also occurred, for example, damage of the lingual nerve, the marginal mandibular branch of the facial nerve and the duct of the submandibular gland. And the rare cases of mucocutaneous fistulae or mucocele formation and airway complication secondary to the submental edema were also reported (Ogata et al, 2001; Stranc and Skoracki, 2001). Green and Moore reported the submental endotracheal intubation with an endotracheal tube exchanger using two separate tubes (Drolet et al, 2000). After general anesthesia and placement of an oral endotracheal tube, a second endotracheal tube was introduced through a submental incision and subsequently substituted into the larynx. To minimize the apnea time and to minimize the cuff damage and make relatively small submandibular incision while passing the endotracheal tube through the submental passage, they removed and reconnected the plastic connector.

The routine procedures of submental intubation are as follows (Bennet and Spiro, 1999; Laplace et al, 1999):

1. A 2-cm submental skin incision is made parallel and medial to the inferior border of the mandible.
2. Blunt dissection with a hemostat is made along the medial surface of the mandible.
3. The dissection is carried through the skin, subcutaneous tissue, platysma muscle, mylohyoid muscle,
and mucosa.

4. The hemostat should penetrate the mucosa of the floor of the mouth at the junction of the attached and free mucosa.

5. A 2-cm mucosal incision that parallels the mandible is made at this junction.

6. The hemostat is spread to establish a channel through which to pass the endotracheal tube.

7. The connector to the endotracheal tube is removed and the hemostat grabs the end of the reinforced endotracheal tube from within the mouth.

8. The pilot balloon and the end of the reinforced endotracheal tube are then passed extraorally through the floor of the mouth (Fig. 5).

9. A reinforced endotracheal tube is required to accommodate the angulation of the tube through the floor of the mouth.

10. The connector is reattached and endotracheal position with bilateral breath sounds are confirmed.

11. The endotracheal tube is then secured to the skin in the submental region with a suture.

12. If intermaxillary fixation is not maintained and if postoperative ventilation is required, the submental intubation can be reconverted to an oral intubation.

13. And if intermaxillary fixation is maintained, the patient may be extubated in the operating room or postanesthesia care unit (PACU), as indicated through the submental site.

14. Submental skin closure is achieved once the tube is removed from the submental site.

REFERENCES


