

Submental exteriorization of an endotracheal tube in panfacial fractures

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Introduction

Securing the airway in patients with injuries in the maxillofacial region is often a serious challenge to the clinical skills of the anesthesiologist. Submental endotracheal tube exteriorization may be an alternative method for airway management of panfacial fractures [1]. In addition, it allows exposure and reduction of fractures in the maxillofacial area without interference by the orotracheal tube. We report a patient with panfacial fractures who was managed successfully using this uncommon approach.

Case report

A 36-year-old man was admitted to our hospital after a traffic accident. He presented with multiple facial injuries. He was awake but looked agitated, in imminent danger of losing his airway. Orotracheal intubation was performed in the emergency room after rapid-sequence administration of induction agents (thiopental and succinylcholine). Following control of the airway, the emergency staff ruled out other life-threatening injuries.

On admission to the operating room, surgical and anesthesia management was planned. The maxillofacial surgeon preferred to reduce the fractures with intermaxillary fixation, thereby not interfering with the oral tube. Nasotracheal intubation was ruled out owing to

the potential risk of removing the tracheal tube in the presence of airway edema. Submental exteriorization of the tube was considered because of the presence of a penetrating wound in this region and possible tracheal extubation within a few hours.

The wound was dissected with digital intraoral control. After intra/extraoral perforation was accomplished, the distal tip of the endotracheal tube was pulled out via the submental route. The patient was immediately reconnected to the anesthesia machine and the tube secured in place with a simple suture (Fig. 1). Anesthesia was provided with fentanyl and isoflurane and neuromuscular relaxation with vecuronium. The anesthesia proceeded without complications.

The surgical procedure with rigid internal fixation was successful, and the fractures were reduced. His immediate postoperative recovery was uneventful. The trachea was extubated 24h later when the patient was able to maintain protective airway reflexes, although wire cutters and a surgical tracheotomy tray were available at the bedside because it was possible to lose the airway. He was transferred to a regular surgical ward 48h after the accident and was discharged home 10 days later without sequelae.

Discussion

Patients with severe midfacial fractures may have upper airway obstruction secondary to the presence of foreign bodies in the airway, edema, or compression of the larynx or trachea by active bleeding within the closed fascial planes of the neck. Blood, edema, or altered anatomy may prevent visualization of the trachea, at which time the decision must be made rapidly to obtain a surgical airway by whatever means available.

In less emergent situations more careful assessment of the best method of airway control and surgical procedure is possible [2]. For the maxillofacial surgeon, one

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Fig. 1. Submental route and stabilization of the endotracheal tube with sutures

of the principal concerns about treating these fractures is correct reduction of the bones of this region and being able to finish the procedure with intermaxillary fixation. It is clear that airway management during less urgent cases is complex and requires advance planning and close communication between surgeon and anesthesiologist.

Techniques such as nasotracheal intubation and tracheotomy are considered the methods of choice for airway control in patients who need intermaxillary fixation. Nasotracheal intubation is the usual route. However, patients with concurrent intracranial damage, inhalation injury, pulmonary pathology, or pathology requiring prolonged postoperative ventilation of the lungs are commonly managed with tracheotomy [2]. Otherwise, subjects with altered anatomy, such as those with facial trauma, the nasal approach may be impractical or impossible. Furthermore, nasotracheal intubation is relatively contraindicated in patients with concurrent fractures of the cribriform plate or basilar skull fractures [2,3].

When the nasal route is impossible or contraindicated, and the tracheal extubation is expected in a few hours, submental endotracheal exteriorization/fixation may be indicated. This technique was first described by Hernández Altermir in 1986 [1]. The endotracheal tube must pass through the submental and paramedial region, parallel to the lower mandibular border, to reach the sublingual space. This route allows exposure and reduction of fractures in the maxillofacial region without interference by the oral tube. There may be some postoperative complications such as infection or damage to structures of the floor of the mouth and a risk of submental fistula. The principal advantages of

this method are that no further intraoperative repositioning of the endotracheal tube is required there is and no need for tracheotomy [4,5]. Although the decision to choose this procedure seems to concern the surgeon more than the anesthesiologist, it is useful to be familiar with the technique and its advantages and complications for such special cases as the present one.

Another crucial decision during the management of patients with maxillofacial trauma is when to remove the endotracheal tube. Tracheal extubation of these patients is done only after adequate evaluation. It is based on multiple factors, including the alertness of the patient, the patient's ability to maintain airway reflexes, the potential for residual respiratory depression, and airway edema. Despite careful evaluation, it must be recognized that the decision to extubate the patient may still be incorrect. Therefore it is appropriate to have a surgical tracheotomy tray at the bedside. If there is maxillomandibular fixation, wire cutters must always be ready [2].

In summary, submental endotracheal tube exteriorization is a simple, relatively safe approach to be kept in mind by the anesthesiologist and maxillofacial surgeon. In unusual circumstances, it is a useful alternative to more traditional methods for airway management of midface fractures.

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