

Submandibular intubation in awake patient of panfacial trauma

ABSTRACT

Maxillofacial trauma patients present with airway problems. Submandibular intubation is an effective means of intubation to avoid tracheostomy for operative procedures. Airway is secured with oral endotracheal intubation in paralyzed patient and tube is then transplaced in sub mental or submandibular region. However there may be instances when paralyzing such trauma patients is not safe and short term tracheostomy is the only airway channel available for conduction of anesthesia. We report a case of submandibular intubation in awake patient of maxillofacial trauma with anticipated intubation problems.

Key words: Endotracheal intubation; maxillofacial; submandibular

Introduction

Maxillofacial trauma is a test of innovative skills of anesthesiologist. Nonavailability of oral and nasal airway channels for passage of endotracheal tube and anatomical disruptions pose a challenge to these skills. Having to share a common field with surgeon enhances the challenge further. To combat these instances where the usual route of intubation is not accessible, alternative techniques of intubation have been devised. The standard solution in these situations is to perform an elective short-term tracheostomy^[1] before the operation. Alternative approaches to endotracheal intubation are submental/submandibular to accomplish simultaneous treatment of all fractures.^[2]

Conventional submandibular intubation technique and its modifications using single or two tubes (Rail Road Technique) have been performed after inducing general anesthesia to secure airway with an oral endotracheal tube and then transpositioning the tube in the submandibular segment. We report a case of panfacial fractures where both oral and nasal

routes of endotracheal intubation were not available, and we had to choose either short-term operative tracheotomy or submandibular route for placement of endotracheal tube in an awake patient as we were averse to paralyzing the patient for general anesthesia because of limited mouth opening and restricted temporomandibular (TM) joint movement. We chose submandibular intubation.

Case Report


Twenty-three years male sustained facial injuries in a road traffic accident. He had complex midfacial fractures. Preanesthesia evaluation revealed no history of loss of consciousness, vomiting or seizures, and other significant medical or surgical illnesses in the past. On examination, he was conscious and had stable vitals. His airway assessment revealed a restricted mouth opening of one finger breadth. TM joint mobility was restricted. Mallampatti scoring could not be assessed because of restricted mouth opening. His laboratory investigations revealed a normal hemogram and

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KAMRA SK, KHANDAVILLI HK, BANERJEE P¹

Departments of Anesthesia and ¹ENT, JLN Hospital and Research Centre, Bhilai, Chhattisgarh, India

Address for correspondence: Dr. Sunil Kant Kamra, Department of Anesthesia, JLN Hospital and Research Centre, Bhilai - 490 009, Chhattisgarh, India. E-mail: kamrasunilkant@gmail.com

coagulation profile. X-rays and computed tomography were suggestive of fracture maxilla Le Fort I with a fracture left malar zygoma and also nasal bone fracture extending to outer plate of frontal bone with no cerebral injury. Open reduction and internal fixation for the complex midfacial fracture, closed reduction of the nasal bone fracture, arch bar fixation along with maxilla mandible fixation with submandibular intubation was planned. He was given oral midazolam 15 mg and intramuscular glycopyrrolate 0.2 mg inward. In operating room, the patient was connected to multipara monitor for physiological monitoring and nebulized with 1 ml of 4% xylocaine solution for 15 min. Fentanyl 100 μ g was given intravenous. Oral mucosal anesthesia was achieved with xylocaine spray. A transverse skin incision of 1.5 cm was made after infiltrating the site with 0.5% plain xylocaine in the right submandibular area one inch below and half inch anterior to the angle of the mandible to avoid injury to a mandibular branch of facial nerve. Subsequent tissue layers were dissected, namely fat, platysma, investing layer of deep cervical fascia, and mylohyoid till the mucous membrane of the oral cavity was reached. The incision on the mucous membrane allowed tip of artery forceps to be introduced into the oral cavity. A sterile gum elastic bougie was introduced through the incision into the oral cavity [Figure 1]. Patient's trachea was intubated with endotracheal tube size 8 mm ID using a fiber optic endoscope after achieving surface anesthesia with a first and second dose of 2% xylocaine at laryngeal opening and trachea [Figures 2 and 3].

A new flexometallic tube of size 8 was negotiated over bougie through the incision and bougie was withdrawn. Bougie was then passed through the oral endotracheal tube, and the tube was withdrawn over the bougie leaving it in place. The outer end of the bougie was introduced into the patient end of submandibular flexometallic tube and tube was guided over the bougie into the trachea [Figure 4]. Correct tracheal placement and adequate ventilation were confirmed. The patient was breathing spontaneously all through. Now, propofol and vecuronium were used for induction of general anesthesia. Tube was then secured in place with sutures [Figure 5]. No problems were encountered during the surgery in terms of airway manipulations. The patient was extubated via the submandibular route. The wound was closed by tightening the stay sutures already placed. No complications were encountered in the postoperative period.

Discussion

The submental route for tracheal intubation first introduced by Sir Hernández Altemir, in 1986,^[3] provided an effective alternative to short-term tracheostomy. Stoll later described a similar technique



Figure 1: Bougie introduced from the submandibular incision into the oral cavity

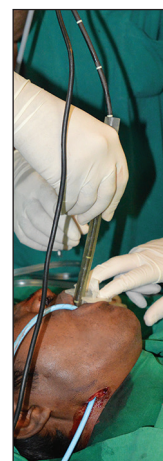


Figure 2: Oral intubation using fiber optic laryngoscope



Figure 3: Bougie and orally placed endotracheal tube

to submental intubation but where the incision is placed further posterior in submandibular region.^[4] This is an easy and convenient modification avoiding potential complications of submental technique like damage to the sublingual gland, submaxillary duct, and lingual nerve. This was followed by another modification



Figure 4: Bougie being threaded into the submandibular endotracheal tube

reporting use of two endotracheal tubes, one antegrade and another retrograde. This is claimed to be superior because there is less chance of hypoxia in paralyzed patient.

Submandibular/submental intubations and modifications have been performed under general anesthesia. However, there are instances when a case of faciomaxillary trauma presents with distinct contraindication to paralysis for intubation and also warrants airway channel away from conventional oral or nasal routes. In such instances submandibular intubation using fiber optic laryngoscope under sedation, surface and infiltration anesthesia is a possibility. We do not intend a debate on merits or demerits of tracheostomy or submandibular intubation but only reporting successful submandibular intubation in the awake patient of maxillofacial trauma.



Figure 5: Submandibular placement of the endotracheal tube

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Conflicts of interest

There are no conflicts of interest.

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