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Original Research Paper

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"RETROMANDIBULAR INTUBATION IN A PATIENT WITH MAXILLOFACIAL TRAUMA: AN ALTERNATIVE TO TRACHEOSTOMY."

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ABSTRACT An anesthesiologist is presented with a serious challenge when a patient with pan facial trauma comes for maxillofacial surgery to the operating room. Here we have a 26 year old female patient with bilateral left sided Le Fort's II fracture in which we performed an oral endotracheal intubation which was further modified to submandibular intubation approach. The submandibular intubation is a modification of submental intubation and is a better alternative method than short term tracheostomy.

KEYWORDS : Maxillofacial Surgery, Panfacial Fracture, Le Fort's Fracture, Tracheostomy, Submandibular Intubation.

INTRODUCTION

Shared airway is the primary concern of an anesthesiologist during maxiloofacial surgeries. It is also a surgical concern because the tracheal tube might impede the surgical field and may get displaced or dislodged. To avoid such scenarios the anesthesiologists employ techniques such as fiber-optic guided nasal intubations. However, in panfacial fractures where the surgeon requires an unobstructed surgical field an elective tracheostomy can provide the solution.

Submandibular intubation is an atypical method of establishing a definitive airway. It was invented by a Spanish maxillofacial surgeon, Francisco Hernandez Altemir, who described the technique of submental intubation in his original work published in 1986 as an alternative to tracheostomy [(1)]. This technique copes up with the associated side effects and patient discomfort arising due to elective tracheostomy procedures. The submandibular intubation is a better alternative method for short term tracheostomy [(2)].

Case Report

A 26 year old, American Society of Anesthesiologist (ASA) Grade - II female patient allegedly had a road side accident and presented with panfacial fractures. She was evaluated and posted for open reduction and internal fixation of the fractures.

She had no history of loss of consciousness, no history of vomiting or abnormal body movements. She had swelling over bilateral maxilla and nose area. Blood clots were present in the nostrils but there was no active bleeding. Oral cavity could not be assessed due to the inability to open her mouth. Facial Nerve examination was normal. She was moderately built and nourished with stable vitals and normal cardiovascular and respiratory system findings. She was conscious, co-operative and well oriented to time, place and person. On airway examination, we found a restricted mouth opening of only one and half fingers (due to pain). Mallampatti scoring couldn't be assessed. The temporoma ndibular joint mobility was restricted. Both the nares of the patient were patent with bilateral equal free flow of air on forced expiration. Her laboratory investigations revealed a normal haemogram and coagulation profile. X-rays were suggestive of maxillary, nasal and symphysis fractures. Her NCCT Head and Face showed comminuted Fractures on the posterior wall of bilateral Maxillary sinus extending to the right medial pterygoid plate and left medial and lateral pterygoid plate. There was comminuted fracture of the bilateral nasal bones and nasal septum. There was comminuted fracture of inferior alveolar process extending to the angle of mandible along with fracture of bilateral ramus of mandible and fracture of the superior alveolar process in midline.

The patient was planned for surgery using oral endotracheal intubation modified to submandibular approach as a technique for securing the airway under general anesthesia. The procedure was explained to the patient and his relatives in their own native language and written informed consent was obtained. However, fibreoptic nasal intubation was kept standby for possible tracheostomy in the event of any emergency. The patient remained fasting and was given Tablet Alprazolam 0.25mg with Tablet Ranitidine 150mg the night before surgery.

The patient was brought in the operating room on the day of the surgery with an 18G i.v. cannula in the left forearm along with an infusion of 0.9% normal saline at 90ml/hour. All standard monitoring including ECG, pulse oximeter and non-invasive blood pressure was attached.

Premedication was given using Inj. Glycopyrrolate 0.01 mg/kg, Midazolam 0.5 mg/kg and Fentanyl 1-2mcg/kg. Patient was preoxygenated with 100% oxygen for 3 minutes and anesthesia was induced Propofol 1.5 mg/kg. Suxamethonium 100mg intravenously was administered as the muscle relaxant for intubation and the patient was intubated using 7.0 mm ID flexometallic cuffed endotracheal tube (Figure 1). Tube placement was confirmed using bilateral chest auscultation and capnograph tracing. On successful placement, the tube was secured and the breathing circuit was attached. The patient was ventilated using oxygen (40%), N_2O (60%) and Isoflurane (0.2-1%) and Injection Atracurium 0.5mg/kg was given. The throat was adequately packed and anesthesia was maintained using 60% nitrous oxide, 40% oxygen and Isoflurane 0.2 – 1%.

Figure 1: Oral Endotracheal Flexometallic tube

Subsequently, a 1.5 cm incision is made through the skin in the left anterior submandibular region parallel to the inferior border of the mandible so as to avoid injury to the marginal mandibular branch of the facial nerve. In our case we prefered the anterior submandibular approach instead of the submental approach as there is a risk of the endotracheal

tube pushing the tongue upwards and blocking the surgical field. Then we performed blunt dissection through the platysma, the deep cervical fascia and the mylohyoid muscle upto the lingual cortex of the mandible, preventing any injury to the ducts of the lingual and submandibular salivary glands. After the track was successfully created we first pulled out the pilot balloon through the track below the mandible (Figure 2). The breathing circuit was then detached from the machine end of the tube and the machine end of the tube was grasped, exteriorized and secured to skin below the mandible with sutures (Figure 3). An adhesive plaster fixing was placed over the tube. The patient was put on 100% FiO_2 before disconnectiong from the breathing circuit to increase the margin of safety. The breathing circuit was re-attached and ventilation was confirmed using auscultation and capnograph tracings. Anesthesia was maintained using Oxygen (40%), Nitrous (60%) Isoflurane (0.2-1%) and Atracurium (0.1mg/kg) in incremental doses and the surgery was proceeded.

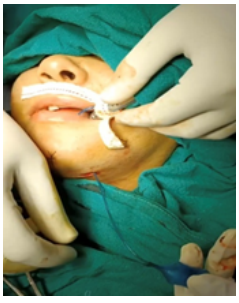

Figure 2: Pilot Baloon through the submandibular inscision.

Figure 3: Left submandibular approach of intubation.

At the end of the surgery, the sutures and adhesive plaster fixing were removed while all the anesthesia gases were stopped. The patient was put on 100% FiO_2 and was extubated. The submandibular incision was sutured and bandaged. The extubation was smooth and the patient recovered spontaneously.

Complications associated with submandibular intubation include localized infection, scarring, post-operative salivary fistula, mucocele formation on the floor of the mouth and paraesthesia of the lingual nerve. We observed no such complications in our patient in the post operative period.

DISCUSSION

The submental route for tracheal intubation was first introduced by Sir Hernandez Altemir in 1986 [2]. Submental tracheal intubation also avoids the potential complications associated with nasal intubation and tracheostomy [3].This technique provides a secure airway while at the same time allowing an unobstructed surgical field for adequate reduction and fixation of midface and panfacial fractures [4].

Stoll described a similar technique to submental intubation but where the incision is placed further posteriorly in the submandibular region and Prochno reported 14 patients who underwent submanbular transmylohyoid intubation [5, 6]. Submandibular intubation is a modification of submental intubation. It was found to be an easy and convenient technique which avoids the potential complications of submental approach like, damage of sublingual and submaxillary ducts, sublingual gland and lingual nerve. Partial extubation of the tube was a common documented complication [7]. Securing the tube by both skin sutures and adhesive bandage by doing the submandibular positioning of the tube under direct laryngoscopic vision prevented the above complications.

In conclusion, the submandibular method is a novel, alternative method for tracheal intubation in patients with craniomaxillo-facial injuries coming for surgery. It is a low morbidity technique, avoids the complication that occur with tracheostomy and nasal intubation. The procedure has minimal complications and patient's airway is not compromised. This technique has changed the way of establishing an airway in complex types of facial surgeries; it is simple, almost devoid of complications in comparison with tracheostomy, has a better aesthetic outcome and is certainly recommended.

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