

Submental Intubation in Maxillofacial Surgery—A Case Report and Review of Literature

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Case Report

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Abstract: Submental intubation is a viable alternative to tracheostomy in patients with serious panfacial or other complex maxillofacial injuries where airway management is important. Submental intubation gives the ease of operation to the surgeon and the anaesthetist as the occlusion is an important guide for maxillofacial fixation. Patients in whom the nasal or the oro tracheal intubation possesses surgical difficulty can prefer submental intubation. We are presenting a case where we avoided tracheostomy in a patient with panfacial fracture and opted for submental intubation, along with review of literature.

Keywords: Alternative, Nasotracheal, Oro tracheal, Occlusion, Pan facial fracture, Tracheostomy.

INTRODUCTION

Maxillofacial surgical procedure including panfacial or midface fracture with concomitant mandibular fracture poses a problem to both the anaesthetist and the surgeon. From proper intubation till the completion of surgery the anaesthetist and surgeon both play a great role in the surgical procedure [1]. In patient with nasal pyramid fractures, fracture of cribriform plate of ethmoid, nasotracheal intubation becomes difficult for anaesthetist. In panfacial fracture or midface fracture along with mandibular fracture the intraoperative checking of occlusion is required, so the maxillofacial surgeons need the tube to be out of its field which hinders occlusion [2]. Submental intubation from its time of existence proved to be very useful for the maxillofacial surgeons [3].

CASE REPORT

A 50 year old male with a history of road traffic accident was referred to our department of oral and maxillofacial surgery. The patient was diagnosed with pan facial fractures which included fracture involving all third of the face. Fracture was present over bilateral nasal bones, right frontozygomatic suture, left unilateral lefort II, and bilateral parasymphysis fracture of mandible (figure – fracture). Patients Glasgow coma scale was 15/15, conscious, cooperative well oriented to time place and person. The treatment plan was open reduction and internal fixation with intraoperative intermaxillary fixation, under general anaesthesia.

As the need for intraoperative checking of occlusion was needed along with maxillomandibular

fixation, and bilateral nasal bone was fractured, submental intubation was planned. Before intubation process was commenced, the detachable connector of the flexometallic tube was loosened using a blunt instrument and was checked for ease of removal (figure – 1). Following muscle paralysis and intravenous induction, initially oral intubation was carried out after scrubbing, painting and draping the surgical site. The technique suggested by Hernandez Altemir was followed. The patient was intubated orally with the same flexometallic endotracheal tube. The orotracheal intubation was then converted to a submental intubation. Strict asepsis was followed, sterile scrubbing, painting was done with savlon and povidon iodine over the submental intubation area. Lower border of the mandible was palpated; 2 cm below the lower border of the mandible, a 2cm long paramedian incision

was marked. Lignocaine 2% with adrenaline 1:80,000 was infiltrated at the incision site. Incision was placed over the marked line (figure- 2). A curved hemostat was passed from the submental incision through the subcutaneous layers, platysma, deep fascia, mylohyoid muscle, submucosal layer and mucosa of floor of the mouth (figure - 3). At all times the curved hemostat was kept in close contact with the lingual border of the mandible and then the hemostat was felt intraorally. After an elevation of the hemostat was felt intraorally through the free mucosa of the floor of the mouth, an incision approximately 1.5 cm was made at this site. Curved hemostat was communicated intra orally. A Communication was made from the extraoral to the intraoral site. The endotracheal tube was briefly disconnected from the breathing circuit, and the tube

connector was removed from the tube. First the pilot balloon was gently brought out through the tunnel, then the tube was exteriorised from the submental incision. The tube was connected to the ventilator and pilot balloon was inflated, rechecking of breath sound was done to assuring proper placement of the tube. , the tube was secured to the chin with silk sutures (figure -4) According to the treatment plan intermaxillary fixation was done according to the desired occlusion. Open reduction and fixation was done with miniplates for proper stabilization of the fracture fragments. At the end of the surgery the intermaxillary fixation was removed and the submental intubation was changed to oral intubation and incision site was sutured back (fig – 5, 6, 7). The patient was extubated uneventfully.

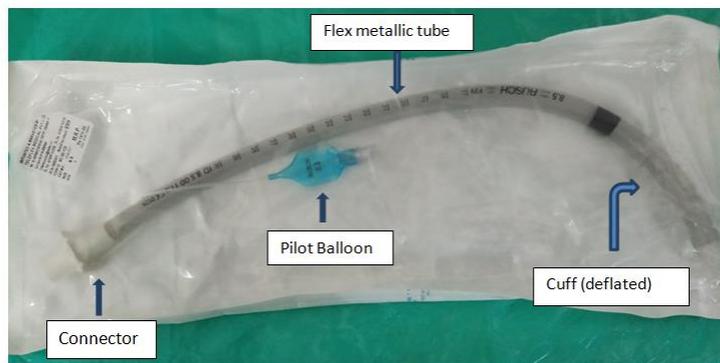


Fig-1: Flexo metallic tube



Fig-2: 2 cm incision given on the paramedian to the symphysis region



Fig-3: Curved hemostast is introduced extraorally from skin incision site and the lingual mucosa is breached, close to the lingual surface of the mandible



Fig- 4: The cuff and endotracheal tube is exteriorised



Fig-5: Bilateral parasymphysis fracture



Fig-6: Fracture above the frontozygomatic suture



Fig-7: Lefort II on right side fixed with 4 whole 'L' plate at zygomatico maxillary buttress and 2 holes with gap straight plate below pyriform aperture

DISCUSSION

Submental intubation was first introduced by Francisco Hernandez Altemir in 1985. The technique of intubation is an easy alternative to tracheostomy or oroendotracheal or nasoendotracheal intubation [4]. In complex maxillofacial fractures, pan facial fractures and lefort fractures, the intraoperative checking of occlusion and intermaxillary fixation is an important step in the fracture treatment [5]. Orotracheal intubation in most of the time is not recommended in maxillofacial fractures as it hinders the checking of occlusion and in the surgeon's field [6]. Nasotracheal intubation can be used as it also allows establishment of occlusion and maxillomandibular fixation without interfering in the intraoral surgical field. But in cases where a fracture of the nasal pyramid or anterior cranial base is present then this kind of intubation is contraindicated. Other conditions like deviated nasal septum, hypertrophic turbinates, nasal polyp, anterior skull fracture, patients with cerebrospinal fluid rhinorrhoea, meningitis and communication of nasal cavity with cranial cavity nasotracheal intubation is contraindicated as it would do more harm than benefit[2].

Tracheostomy has complications like tracheal stenosis, internal emphysema, laryngeal nerve damage, tracheo esophageal fistula, hemorrhage, pneumothorax, blockage or obstruction of the cannula, major scarring

and prolonged hospitalization but in severe cases of airway compromise tracheostomy should be the choice of intubation [7]. Retromolar intubation is also an alternative which can help in checking intraoperative occlusion and maxillomandibular fixation can be done, but decrease in the space posterior to the last molar can complicate this technique of intubation [8]. Another alternative nasal tube switch technique which can be performed, but it is avoided due to problems associated with the intraoperative re-intubation, risk of aspiration due to posterior nasal bleeding, potential airway compromise with need for emergency tracheostomy/cricothyrotomy, unfavourable manipulation of an unstable cervical spine, excessive stress on fixations with possible loosening of plates and screws[9].

Submental intubation technique is carried out after normal oral intubation; mostly a flexo metallic tube with a detachable connector is preferred as the chances of kinking of the tube near the lingual cortex of the mandible is minimised [5]. An incision measuring approximately 2cm is marked paramedian or median to the submental region. The incision should be parallel to the lower border of the mandible and at about one finger breadth away from the lower border of mandible. If a pre-existing laceration or a scar is present the incision position can be modified accordingly [4]. After marking the incision of about 2 cm in length, under

strict aseptic protocol local anesthesia lignocaine 2% with adrenaline (1:80,000) is infiltrated for decrease hemorrhage [9]. A 2 cm long incision is placed over the marking. The skin and the cervical fascia of the neck is incised. A curved hemostat is inserted through the incision keeping always in contact with the lingual cortex of the mandible in the medial aspect. After this the mylohyoid muscle is breached by the curved hemostat, so this technique of intubation is also referred to as transmylohyoid intubation, it was first coined by Gadre and Waknis[3]. Intraorally the lingual mucosa is continuously palpated to feel the elevation created by the tip of the artery, when the artery is felt, an incision approximately 2cm is made in the lingual mucosa and a tunnel is formed [9].

First the pneumatic cuff is deflated and exteriorization of the cuff is done by the curved hemostat or a Macgill forcep from intra oral to extra oral and later the tube is brought outside from the mouth through the tunnel. At last the pneumatic cuff is inflated after connecting the tube with the portex connector [5]. A nasal speculum introduced in the tunnels can help to pass the endo tracheal tube easily [4]. The tube is either sutured to the skin or secured with a dynaplast. After this throat pack is placed and surgery is carried out [10]. During extubation the submental route is reversed to oro tracheal intubation and a similar process of extubation is followed. The submental incision is sutured back [5].

The contraindications of submental intubation are patients' refusal, bleeding diathesis, laryngotracheal disruption, infection at the proposed site, gunshot injuries in the maxillofacial region, long-term airway maintenance, tumor ablation in maxillofacial region, and history of keloid formation [3]. But it should be kept in mind that submental intubation should not be thought as a first line of intubation, it should only be done if the oral or nasal route of intubation is contraindicated or not achievable. Possible complications like skin infections, venous bleeding, oro cutaneous fistula, keloid, dislodgement and obstruction of the endo tracheal tube, mucocele formation, transient laryngeal nerve palsy, partial extubation, pilot balloon entrapment and detachment [4].

Various modifications of this technique have been done by many surgeons. Green and Moore adopted two-tube technique when they had to work with ETT's in which universal connector was nonremovable [10]. Percutaneous tracheostomy dilation kit is also used to aid in this type of intubation [11]. A 100% silicon wire reinforced tube primarily intended for intubation through intubating laryngeal mask airway (ILMA) is a better option as it has an easily removable universal connector [12]. Over the past 3 decades submental intubation and its modification has proved to be an easy alternative when other techniques of intubation are contraindicated [3].

CONCLUSION

Submental intubation is a safer and an easy alternative for patients with pan facial or midfacial maxillofacial fractures, which offers the maxillofacial surgeon the ease to check occlusion and establishment of maxillilommandibular fixation intraoperatively.

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