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Modified Submental Intubation –RD Technique

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Abstract
Patients with panfacial fracture pose a unique set of problems to the anaesthesiologist and surgeon and both are competing for the same space. In such cases submental intubation can be done. Here we discuss a modified approach to submental intubation which reduces apnoea time and damage to pilot balloon of tube.

Introduction

Panfacial fractures involving the cranium, midface and the mandible are challenging cases for the anesthesiologist.[1] An important consideration at the time of surgery is the maintenance of airway without interfering with the reconstruction of fractured segments. Patients with panfacial fracture pose a unique set of problems to the anaesthesiologist and surgeon and both are competing for the same space. The surgeon needs access to an unobstructed field; and in most instances; maxillomandibular fixation is required intraoperatively for adequate reconstruction of facial fractures.[2],[3] Therefore, in these types of injuries, the mode of intubation is controversial, with many anaesthesiologists arguing against nasal intubation. Oral intubation may interfere with proper maxillomandibular reduction. In situations where maxillomandibular fixation is required and nasoendotracheal intubation is contraindicated, a cricothyrotomy or tracheostomy has been the traditional method of airway control.[4] Submental intubation technique is passing the tube through the anterior floor of mouth, which gives free intraoperative access to oral cavity and nasal pyramid without endangering patients with skull base trauma.[5,6] Submental intubation, thus, as an alternative to tracheostomy can be used when short-term postoperative control of airway is desirable with the presence of undisturbed access to oral as well as nasal airways and a good dental occlusion.

We are reporting two cases of modified submental intubation at our institute.

Case I

7 yr old male child weighing 19 kg had trauma due to entrapment beneath a hand cart. He suffered multiple facial injuries, nasal, oral bleeding accompanied by unconciousness for one hour. CT revealed communited fracture involving both nasal bones,medial and posterior wall of both maxillary sinuses, ethmoid, trabeculae, lateral wall of both orbits and bilateral medial and lateral pterygoid plates.

The child was posted for ORIF for nasoethmoid #.On examination there was gross facial oedema, abrasions and nasal bridge flattening. Vital parameters were stable. Mouth opening was adequate with mallampatti grading-I .Neck

extention was restricted because of neck pain.On auscultation he had bilateral wheeze.

Investigations: all routine investigations were within normal limit. CT BRAIN-normal

Cervical spine X ray-no # revealed.

Consent for submental intubation was taken. Preop bronchodilator nebulisation given with Salbutamol and Budecortisone. Inj. glycopyrrolate 0.2 mg i.m given. Patient was preoxygenated with 100% O2 for 3 minutes and induced with Inj. Propofol 60mg and inj.vecoronium 2 mg.

Maxilla-Mandibular fixation was mandatory for surgery,which precluded the option of oral intubation and because of nasoethmoidal # nasal intubation was not possible. The only two options left were tracheostomy and submental intubation.We opted for submental intubation. Oral intubation was done under direct laryngoscopy with no. 5 portex south pole tube. Anaesthesia was maintained with O2:N2O 40:60 and sevoflurane. Plastic surgeon made an incision around 1.5 cm in left submental region,dissected the area safeguarding salivary duct ,extended the incision intraorally. A 5mm cuffed flexometallic tube was advanced through the incision in the oral cavity. Distal end of the tube with cuff was visualized in the oral cavity with help of direct laryngoscope. Care was taken while advancing the tube to prevent trauma to the cuff at distal end. Under direct vision with laryngoscopy the intial south pole tube was removed and the flexometallic tube was advanced using Magill`s forcep. Tube position was confirmed and fixed with sutures and throat packing done. Surgery started and went uneventfully over 5 hrs. At the end of surgery, direct laryngoscopy done and patient end of submental flexometallic tube was removed and a cuffed portex tube was inserted orally and connected to patient circuit i.e. reverse of the intubation technique done and flexometallic tube is removed though submental incision and incision in closed. The patient was reversed and oral tube extubated after adequate recovery from neuromuscular blockade after which inter dental occlusion was done.

Case II

37 yr old male patient with history of accident had multiple facial #.He was unconscious for few minutes and also gave history of oral bleeding.

On examination patient was consious oriented, vitals were stable. He had oedema around left orbit, left subconjunctival haemorrage, oedema over nasal bridge,# left radius and #right tibia. Mouth opening could not be assessed because of interdental occlusion. CT scan revealed minimally displaced # symphysis menti.# bilateral maxillary sinus,#pterigoid and #right zygomatic.

Interdental occlusion was released before induction and the method of induction was same as in the first case. 8.5mm portex tube was put orally, which was replaced with 8mm flexometallic tube inserted from right submental incision. Throat packing was done. Surgery went uneventful over 6 ½ hr. Surgeons were insistent about interdental occlusion so decision was made to extubate from submental incision. Lignocaine injected at the submental wound with tube in place. Tounge stitch used as in cases of maxillofacial surgeries where both nasal and oral intubations are contraindicated.Patient reversed and extubated from the submental incision after adequate reversal of neuromuscular blockade by cutting the fixation stitch. Submental incision was sutured under local anesthesia.

Fig. 1 - Orotracheal Intubation With No.6 South Pole ETT & Circuit Attached

Fig. 2 - 1.5 Cm LT Sub Mental Incision Taken

Fig. 3 Sub Mental Incision Extended In Oral Cavity

Fig. 4 - Fexometallic Tube With Pateint End Inserted In Sub Mental Incision

Fig. 5 - Portex Tube Removed & Flexometallic Tube Advanced In Trachea Using Magill's Forceps

Fig. 6 Flexometallic Tube In Trachea, Circuit Attached And Tube Fixed

Discussion

Submental intubation was introduced in 1986 by Altemir.[7] It is the route of intubation for panfacial fracture in which maxillo –mandibular fixation is essential. Surgery is considered successful when the stable relation between maxilla and mandible is obtained.[8] Because of the need of maxillo-mandibular fxation,oral intubation is obsolete. Nasotracheal is contraindicated in fear of displacing the fractures, or causing CSF rhinorhea or meningitis. Initially tracheostomy was the only option available. Now a days submental intubation is the best access for airway in such cases.[9] Submental intubation

offers security to the anaesthesiologist, optimal operating field to surgeons, allows intermaxillary fixation and less morbidity to patient. So this technique is ideal for such surgeries.

Tracheostomy has complications like pneumothorax, subcutaneous emphysema, tracheal stenosis, tracheomalacia, haemorrhage, cosmetic disfigurement etc.[10,11] It increases morbidity of the patient. Submental intubation has few complications like infection, orocutaneous fistula and it causes very minimal discomfort to the patient in postoperative period.[12] This route doesn`t leave noticeable scar at incision site. Thus it is preferred over tracheostomy.

Submental intubation can be at times challenging to the anaesthesiologist. Accidental displacement of tube is possible during conversion from oral to submental tube and viceversa. As the tube connector has to be disconnected during manipulation, chances of accidental disconnection are more. Apnea time is prolonged as circuit is disconnected. Trauma to machine end of tube & pilot tube can occur.

In our cases we opted for the R.D. technique-modification of Sub mental intubation to surpass the drawbacks of conventional technique & avoid complications of tracheostomy.

Submental intubation reported uptill now, anaesthetist had passed flexometallic tube orally. The machine end with pilot balloon, (after removing the connector) was taken out from submental incision. We introduced orotracheal portex tube at the time of induction. When submental incision was taken we introduced patient end of flexometallic tube through the incision into the oral cavity. After direct laryngoscopy the initial portex tube was removed and the flexometallic tube was guided with Magill`s forceps into the trachea. The changeover from oral to the submental tube was under vision thus the tracheal intubation was confirmed. We noted the markings on the tube at the level of submental incision and fixation stitch was taken.

The advantages of modified submental intubation-

- Apnea time is reduced.
- No trauma to machine end & pilot tube of ETT.
- No struggle to bring machine end out through submental incision.
- Procedure can be done with leisure time.
- No noticeable scar at incision site.

However, one has to be careful to prevent damage to the cuff of the endotracheal tube. In conventional technique only one tube is used whereas in our technique two tubes are needed.

We noticed one difference between two cases. For child left sided submental intubation was done and for adult right sided submental intubation was done. We normally use right handed laryngoscopy so left submental tube was getting compressed by the blade at the time of intubation and it made the manipulation difficult. In adult the visualization and introduction of right submental tube was much easier.

References

1. Adamo AK, Katsnelson T, Rodriquez ED, Karasik E. Intraoperative airway management with panfacial fractures: alternative approach. J Craniomaxillofac Trauma 1996 Fall;2(3):30-5.
2. Markowitz BL, Manson PN. Panfacial fractures: Organization of treatment. Clin Plast Surg 1989 Jan;16(1):105-14.
3. Shumrick KA, Kersten RC, Kulwin DR, Sinha PK, Smith TL. Extented access internal approaches for the management of facial trauma. Arch Otolaryngol Head Neck Surg 1992 Oct;118(10):1105-12
4. Phero JC, Weaver JM, Peskin RM. Anesthesia for maxillofacial/mandibular trauma. In: Benumof JL, editor. Anesthesiology clinics of North America. Anesthesia of otolaryngologic and head and neck surgery. Philadelphia: Saunders; 1993. pp. 509–23
5. Shetty PM, Yadav SK, Upadya M. Submental intubation in patients with panfacial fractures: a prospective study. Indian J Anaesth. 2011;55:299–304.

6. Kishoria N, Upadhyaya RM, Shah DM, Mahajan A. Submental intubation an alternative to tracheostomy in patients with panfacial fractures. OA Case Reports 2014 Jan 18;3(1):8.
7. Hernández Altemir F. The submental route for endotracheal intubation. A new technique. J Maxillofac Surg 1986;14:64-5
8. Haug RH,Indresano AT : Management of maxillary fractures.In: Peterson LJ.ed. Principles of oral and maxillofacial surgery.Philadelphia:JB Lippincott,1992:469-48
9. Caron G, Paquin R,Lessard MR, et al.Submental endotracheal intubation :an alternative to tracheaostomy in midfacial and panfacial fractures. J Trauma 2002:48:218 -20. [ISI] [Medline]
10. Waldron J, Padgham ND,Hurley SE.Complications of emergency and elective tracheastomy; a retrospective study of 150 consecutive cases.Ann R Coll Surg Engl 1990:72;218-20.[Medline].
11. Callahan V, O Connor AFF. Adult ana paediatric tracheostomy-technique, complications and alternatives. Curr Pract Surg 1994;6:219-22.
12. Ahmed FB,Mitchel V.Hazards of submental tracheal intubation. Anaesthesia 2004:59(4):410-11.