

SUBMENTO-SUBMANDIBULAR APPROACH FOR TRACHEAL INTUBATION

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ABSTRACT

Background: In some maxillofacial surgical procedures, orotracheal intubation obstruct the surgical field and nasotracheal intubations are contraindicated or interfere with surgical procedure. In these patients, tracheostomy is the only way for protection of airways. However, it carries high incidence of complications, demands high quality of postoperative care and longer hospital stay. We performed submento-submandibular intubation in selected patients as an alternative to tracheostomy in such situations.

Aims & Objective: The aim of the study is to evaluate the problems encountered during submento-submandibular intubation. This study also investigates the long term complications of this route.

Materials and Methods: This study was conducted on 20 adult ASA – I and ASA – II grade patients of either sex, scheduled for faciomaxillary surgery under general anaesthesia where oral intubation was not suitable for the procedure or nasal intubation was contraindicated or impossible. Extra time needed for submento-submandibular route, problems encountered during procedure and long term complications were recorded.

Results: Extra time needed for this intubation was less than 10 mins; mild hypoxia was encountered in one patient while negotiating the tube through submento-submandibular incision. No other complications were occurred during intraoperative period. Follow up examinations revealed no injury to adjacent structures. The small cutaneous scar was found which left no aesthetic damage.

Conclusion: Submento-submandibular intubation is better alternative to tracheotomy in selected patients in whom postoperative airway protection not required. It shortens hospital stay and less postoperative care is required as compared to tracheostomy.

Key Words: Submento-Submandibular Intubation; Panfacial Trauma; Complications; Airway; Maxillo-Facial Surgery

Introduction

Anaesthetic management for maxillofacial surgical procedures is challenging for anaesthesiologist as these procedures require a protected airways but an unobstructed field. The standard oral route for endotracheal intubation is very uncomfortable for the surgeons as endotracheal tube may obstruct the field. In some cases, when there are maxillary fractures present, dental occlusion is necessary for open reduction and internal fixation. In these cases, an oral tube makes the procedure impossible. Nasotracheal intubation is an attractive option for these cases but may lead to complications (brain damage, leakage of CSF and meningitis). When there are also fractures of the base of skull.^[1-3] It may also obstruct the surgical field in patients requiring simultaneous nasal or naso-orbital ethmoid reconstruction after the rigid fixation of mandible and maxilla. Elective short term tracheostomy is the conventional method for airway management in these patients. However it is difficult to do tracheostomy in children, obese patients and in patients with thyroid swelling.^[4] It may be associated with immediate and late complications. The incidence of immediate complications is 6-8% and they include haemorrhage, surgical emphysema, pneumothorax, pneumomediastinum and

recurrent laryngeal nerve palsy. The incidence of delayed complications is 60 % and they include stomal and respiratory tract infections, blockage of the tube, dysphagia, difficulty with decannulation, tracheal stenosis, tracheoesophageal fistula and suboptimal visible scar.^[5] Another option is submento-submandibular intubation in which after oral endotracheal intubation distal end of the tube is passed through the submento-submandibular incision thus bypassing the surgical field and avoiding the complications of nasotracheal intubation and tracheostomy. The present study was aimed to evaluate the advantages and disadvantages of submento-submandibular tracheal intubation as an alternative method for airway management in such situations.

Materials and Methods

This study was conducted on 20 adult ASA I and II patients of either sex, scheduled for faciomaxillary surgery under general anaesthesia where oral intubation was not suitable for the procedure or nasal intubation was contraindicated or impossible. In these cases, Submento-submandibular intubation was done after written informed consent. The study was approved by the institutional ethical committee. Exclusion criteria for

Submento-submandibular intubation are patient's refusal, bleeding diathesis, laryngotracheal disruption, infection at the proposed site, gunshot injuries in the maxillofacial region, long term airway maintenance, tumour ablation in maxillofacial region and history of keloid formation.



Figure-1: Submento-submandibular intubation

Glycopyrrolate 0.2 mg was administered i.m. as premedication. In the operative room, 18 gauge IV cannula was secured in the left arm. Monitoring included ECG, pulse oxymeter and NIBP. Patient was preoxygenated with 100% O₂ for 3 minutes and anaesthesia was induced with i.v. fentanyl 2 µg/kg followed by propofol 2 mg/kg. Succinyl choline 100 mg i.v. was administered as the muscle relaxant for intubation and orotracheal intubation done with flexometallic endotracheal tube with removable connector. Throat was adequately packed. Atracurium 0.5 mg/kg was used for muscle relaxation and the anaesthesia was maintained with isoflurane 0.8-1% and nitrous oxide 70% in oxygen 30%. An incision was given

approximately 2 1/2 inches anterior to the angle of mandible below 1st and 2nd premolar teeth, just medial to inferior border of mandible; a blunt dissection is done with straight mosquito artery forceps. Keeping the reference point of medial border of mandible, a through and through passage created, wide enough to insert endotracheal tube, in floor of the mouth. Patient was switched over to 100% O₂ for 1 minute. Surgeon introduced artery forceps from outside in to the oral cavity through tract. Distal end of tube was supported by anaesthetist's thumb and index finger and pilot balloon was pulled out by surgeon. Tube was disconnected from Bain circuit. Tube connector was removed. Distal end of tube was pulled out through skin incision and cleaned of any blood or secretion. Tube connector was again attached to the tube and tube connected to Bain circuit. The tube was supported in the oropharynx throughout to prevent accidental extubation or inward pushing of the tube. After checking the tube position, a mark was made on the tube skin exit site. A silk stay suture was made to fix the tube of the skin in the submandibular region. The tube was further secured by adhesive tape applied circumferentially. Any blood present was suctioned and throat pack was changed to a fresh one. Anaesthesia was continued with isoflurane 0.8 - 1% and nitrous oxide 70% in oxygen 30% controlled ventilation was facilitated by atracurium besylate. At the end of the operation, the stay suture and adhesive tape were removed and tracheal tube was pulled back to the oral cavity followed by pilot balloon. The Submento-submandibular incision was sutured with nylon 3-0 and intraoral sublingual wound was also sutured with 3-0 vicryl, to avoid any secondary infection in oral cavity. Neuromuscular block was reversed with glycopyrrolate 0.2 mg and neostigmine 2.5 mg. the patient was allowed to regain consciousness and after confirmation of airway security, the trachea was extubated. We recorded extra time needed for Submento-submandibular intubation. Any complications occurred during intraoperative period were also observed.

During the postoperative period, care of intra oral wound is done by mouth wash six hourly with 0.12% chlorhexidine. The extra oral wound was taken care by giving antiseptic ointment dressing, every alternate day. The patients are followed up till discharge and after 1, 3 and 6 months postoperatively.

Results

20 adult patients of ASA - I and ASA - II grade were

included in the study. There were male and female ratio was 3:2. The mean duration for Submento-submandibular intubation was less than 10 minutes. Intubation through Submento-submandibular route was found to be convenient and comfortable for both surgeon as well as anaesthetist without obstructing airways it permitted surgical occlusion and manipulation very effectively and freely. It also prevented injury and bleeding in already traumatized nasal bones thereby avoiding complication occurring in airways mild hypoxia was encountered in one patient while negotiating the tube through Submento-submandibular incision. Difficulty in suctioning the tube was faced in one patient who was immediately corrected by extending the neck. Trauma to endotracheal tube was not observed in any case.

Postoperative period was uneventful. None of the patient had found infection in follow up period on 1, 3 and 6 months small cutaneous scar was found which left no aesthetic damage. Follow up examination revealed no injury to adjacent structures.

Discussion

Submento-submandibular intubation is a suitable alternative to tracheostomy in patients in whom orotracheal and nasotracheal intubation are contraindicated, impossible or may interfere the surgical access or techniques. Tracheostomy itself has several inherent risks and needs more intense postoperative care. It also increases the duration of hospital stay. In submento-submandibular intubation, less postoperative care is required and patient discharged from the hospital early. Submento-submandibular intubation is a modification of submental intubation, first described by Hernandez Altemir in 1986.^[6] There is difficulty in passing the tube through submental incision.^[7] Pulling the end of the tube through the deep cervical fascia in the submandibular area may probably be easier than in the tight submental area.^[8] There are chances of hypoxia if there is difficulty in passing the tube. Traumas to adjacent structures such as and submaxillary ducts, sublingual gland and lingual nerve have also been described in submental intubation.^[6,9,10] Submandibular intubation at the angle of the mandible should be avoided because of the more risk of injury to the submandibular salivary gland and its duct, lingual nerve and the facial blood vessels. To avoid damage to such important structures we opted for submento-submandibular route. Postoperative follow up confirmed

the safety of this route.

Development of mucocele is reported by Stranc and Skorack.^[11] But no such complication has been reported in our patients. However mucocele is developed due to faulty surgical technique when surgical route is prepared from exterior to interior is not developed.

In some patients, after maxilla-facial surgical procedures, postoperative airways protection is necessary. In our study, we excluded these patients and we chose tracheostomy for them. However, HMF Anwer et al.^[8] left the submandibular tube in place for up to 2 days after the operation. Submandibular tube appeared safe and allowed adequate postoperative care.

Conclusion

Submento-submandibular intubation is a better alternative to instead of tracheostomy in selected patients. Extra time required for doing submento-submandibular intubation is nullified by its potential advantages. It can be used in other surgical procedures also in which both oral and nasal intubations are contraindicated. The complications reported by other authors are due to faulty surgical technique. Proper selection of patients, use of flexometallic endotracheal tube with removable connector, proper coordination between surgeons and anaesthetists and frequent checking of endotracheal tube after intubation are key factors for avoiding complications related to the technique.

References

1. Lew D, Sinn DP. Diagnosis and treatment of midface fracture. In: Fonseca RJ, Walker RV, editors. Oral and maxillofacial trauma. Philadelphia: WB Saunders; 1997. p. 515-42.
2. Taher AA. Nasotracheal intubation in patients with facial fracture. *Plast Reconstr Surg* 1992;90:1119-20.
3. Seebacker J, Nozik D, Matheu A. Inadvertent intracranial introduction of a nasogastric tube, a complication of severe maxillofacial trauma. *Anesthesiology* 1975; 42:100-2.
4. Durbin CG, Jr. Early complications of tracheostomy. *Respir Care* 2005;50:511-5.
5. Caron G, Paquin R, Lessard MR, Trepanier CA, Landry PE. Submental endotracheal intubation: an alternative to tracheostomy in patients with midfacial and panfacial fractures. *J Trauma* 2000;48:235-40.
6. Hernandez Altemir F. The submental route forendotracheal intubation. A new technique. *J Maxillofac Surg* 1986;14:64-5.
7. Malhotra N, Bhardwaj N, Chari P. Submental endotracheal intubation: A useful alternative to tracheostomy. *Indian J. Anesth* 2002;46:400-2.
8. Anwer HMF, Zeitoun IM, Shehata EAA. Submandibular approach for tracheal intubation in patients with panfacial fractures. *Br J Anaesth* 2007;98:835-40.
9. Gordon NC, Tolstunov L. Submental approach to oroendotracheal

- intubation in patients with midfacial fractures. Oral Surg Oral Med Oral Path Radiol Endod 1995;79:269-72.
10. Labbe D, Kaluzinski E, Badie-Modiri B, Rakotonirina N, Berenger C. Intubation Sous-mentale en traumatologie cranio-maxillo-mental Note technique. Ann Chin Plast Esthet 1998;43:248-51.
 11. Stranc MF, Skoracki R. A complication of submandibular intubation in panfacial fracture patient. J Maxillofac Surg 2001;29:174-6.

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