



Original Article

Submental intubation: An option of airway management for rhinoplasty and rhytidectomy

Kumkum Gupta, Deepak Sharma, Prashant K. Gupta¹, Amit Bhatnagar²

Departments of Anaesthesiology & Critical care, ¹Radio-diagnosis, Imaging & Interventional Radiology, and ²Surgery, N.S.C.B. Subharti Medical College, Subhartipuram, NH-58, Meerut, Uttar Pradesh, India

Corresponding author: Dr. Kumkum Gupta, 108, Chanakyapuri, Shastri Nagar, Meerut 250004, Uttar Pradesh, India. E-mail: kumkumprashant@yahoo.com

Abstract

Context: For rhinoplasty, full control of facial symmetry will improve the aesthetic results. During rhinoplasty, the nasal intubation is contraindicated while oral intubation may interfere with surgical procedure. Hence an alternative airway option of the submental intubation was planned to study the efficacy of the procedure.

Aims: The submental intubation may improve the aesthetic results of rhinoplasty and facial symmetry.


Setting and Design: This is a prospective cohort observational study.

Materials and Methods: Fifteen adult consented patients of ASA grade I and II of either gender aged 20 to 38 years who met the inclusion criteria were enrolled. After induction, orotracheal intubation was done with flexometallic tube, followed by a 1.5-cm skin incision in the submental region, adjacent to lower border of mandible; then endotracheal tube was taken out through this incision. At the end of surgery, the procedure was reversed and submental wound was stitched. Patients were extubated after proper suctioning of oral cavity. No intraoperative and postoperative complications have occurred.

Results: The submental intubation was performed in 15 patients by medial approach without any difficulty. The average time taken to perform the procedure was 7.27 ± 0.63 min. No anesthetic and surgical complications were encountered in any patients. The submental scar was almost invisible after 2 months.

Conclusion: Submental intubation offers a secure airway, efficient ventilation, and uninterrupted operating field to the plastic surgeon. Lack of anesthesia and surgical complications encouraged us to present the advantages of submental intubation on the basis of our own experience.

Key words: Aesthetic scar, flexometallic endotracheal tube, rhinoplasty, submental intubation

Access this article online		
Website	DOI	Quick Response Code
www.aeronline.org	10.4103/0259-1162.84195	

INTRODUCTION

Maxillofacial, dental, and plastic surgery including rhinoplasty and rhytidectomy are commonly referred to as shared airway surgery. Surgical procedures vary from simple to complicated facial reconstruction and airway is at risk of soiling due to bleeding and debris. In aesthetic

surgery of the face and neck, full control of facial symmetry improved the final aesthetic and functional results. The choice of airway management in facial reconstruction surgery is determined by patient factors, surgical requirements, and anesthetist preferences. No consensus exists to date as to which is the best way of securing an airway. A cuffed endotracheal tracheal tube provides the highest level of airway protection in shared airway surgery, but may not always be the most suitable technique due to interference with surgical outcome from aesthetic point of view and the nasal route is either contraindicated or impossible.

We utilized submental endotracheal intubation for nasal reconstruction surgery—rhinoplasty/rhytidectomy as an alternative airway management and our experience has been very satisfying because it has avoided potential complications. Lack of anesthesia and surgical complications encouraged us to present the advantages of submental intubation on the basis of our own experience.

The study was planned to observe the efficacy of the submental intubation to improve the aesthetic results of rhinoplasty and facial symmetry.

MATERIALS AND METHODS

The study protocol was approved by the Institutional Ethical Committee. After written informed consent, 15 patients of ASA grades I and II aged 20 to 38 years of both gender scheduled for elective rhinoplasty and rhytidectomy due to cosmetic reasons, from August 2009 to September 2010, were included for this prospective trial study. Infections at the site of incision, bleeding diathesis, disrupted laryngotracheal anatomy, and restricted retromolar space were exclusion criteria. To assess the results of submental intubation technique, time required for submental intubation, accidental extubation, postoperative complications like hemorrhage, injury to the sublingual duct/submandibular duct or lingual nerve, orotracheal fistula, infection, and healing of intraoral and submental scars were evaluated. The time required for submental intubation was calculated starting from the completion of the orotracheal intubation to the fixation of the submental tube.

All the patients had preanesthetic evaluation, including history, general physical examination, systemic examination, and review of biochemical investigations. The technique was explained to the patients to ensure their confidence.

Anesthetic technique

In operation theatre, intravenous infusion of ringer lactate was started and routine monitoring of heart rate, arterial blood pressure, SpO₂ and EtCO₂ was

done. They were premedicated with midazolam 0.05 mg/kg, glycopyrrolate 0.2 mg, fentanyl 2 µg/kg, and metoclopramide 10 mg intravenously. After preoxygenation for 3 min, induction of anesthesia was done by propofol 2 mg/kg in a dose sufficient to abolish eyelash reflex and after proper mask ventilation succinylcholine 2 mg/kg was given to facilitate the initial oral intubation with a 7.5-mm ID flexometallic nylon reinforced (Mallinckrodt® Medical, Athlone, Ireland) cuffed endotracheal tube. The position of the endotracheal tube was checked using capnography and chest auscultation and throat was packed. Before intubation, the universal connector of the flexometallic tube was separated with an artery forceps and reattached so that it can be easily removed from the tube while pulling the tube submentally and can be reattached in the next step.

Technique of submental intubation

Under sterile painting and draping of chin and mouth, 2 ml of 2% xylocaine with adrenaline was infiltrated and a small 1.5 cm transverse skin crease incision was made in the medial region of submental area, 2 cm behind the mental symphysis and adjacent to lower border of mandible [Figure 1]. Blunt dissection was done through the subcutaneous fat, platysma, cervical fascia, and anterior bellies of diaphragic, geniohyoid, and genioglossus muscles to create a tunnel. The mouth opening was maintained using mouth gag. The floor of the mouth was exposed by retracting the tongue. A closed artery forceps was introduced through the submental skin incision and formed tunnel, until the tip of the artery forceps tented the mucosa of the floor of the mouth staying close to the lingual surface of mandible in order to avoid injury to the submandibular duct and the lingual nerve. The tented oral mucosa was incised to make a small opening and the blades of the artery forceps were separated to a distance equal to the diameter of the tube. The endotracheal tube was then disconnected from the breathing circuit and the connector removed. Now the pilot balloon was grasped with an artery forceps and pulled out gently through the passage in the floor of the mouth. The tip of the artery forceps was quickly reinserted through the submental incision and the proximal end of the tracheal tube was brought out through the tunnel using gentle rotational movement in the oral to skin direction while stabilizing the tracheal tube in the oral cavity with Magill's forceps. The connector and breathing system are reattached and the cuff was reinflated. The tracheal tube now lies in the floor of the mouth between the tongue and the mandible. The endotracheal tube fixed by the muscles of the oral floor and may be additionally secured to the underside of the chin with 2-0 black silk suture with cutting needle and elastoplast to prevent accidental displacement, after ensuring bilaterally equal air entry [Figure 2].



Figure 1: Medial approach for submental intubation



Figure 2: Endotracheal tube through submental region

Intraoperative period

Careful monitoring of hemodynamic parameters and SpO₂ was done during the changeover period. Anesthesia was maintained with isoflurane, nitrous oxide 60% in oxygen. Neuromuscular blockade was achieved with vecuronium bromide 0.08 mg/kg and the patients were mechanically ventilated to maintain the normocapnia (CO₂ between 35–40 mmHg) with no tracheal tube within the reconstructive surgical field.

At the end of surgery, the intubation process was reversed. The submental skin sutures were cut, the tracheal tube disconnected, and universal connector was removed. Now the tracheal tube followed by pilot balloon was pulled back through the passage in the floor of the mouth. The tube was reconnected with breathing circuit and secured. The submental incision was closed with 3-0 nonabsorbable surgical suture (Prolene) with 16 mm 3/8 circle cutting needle. The intraoral incision was not closed. The throat pack was removed and residual neuromuscular block was antagonized with appropriate doses of neostigmine 0.05 mg/kg and glycopyrrolate 0.01 mg/kg. Extubation was performed when respiration was adequate.

Postoperative followup

The patients were transferred to anesthesia care unit and monitored for bleeding or any airway problems. The submental stitches were removed after 5–7 days.

RESULTS

Patient's demographic and clinical data included 15 patients (12 males and 3 females) with a mean age 29.2±8.22 years (20–38 years) and mean weight 62.57±7.61 kg. The submental intubation was performed for rhinoplasty or rhytidectomy by medial approach in all patients without any difficulty. The average time taken to perform this procedure was 7.27±0.63 min with minimal

bleeding. The airway was never compromised, and no episode of arterial desaturation occurred while converting oral intubation to submental intubation and vice versa for the surgery. Care was taken not to damage pilot balloon, and universal connector could be easily removed or reattached firmly. During the procedure, no difficulty was encountered in passing the tube through the floor of the mouth. The submental skin incision was sutured with 3-0 nonabsorbable surgical suture and stitches were removed after 5–7 days. There was no requirement for intraoral sutures. All patients were extubated through oral route after proper suctioning of oral cavity.

In one patient, there was accidental disconnection of tube from the circuit perioperatively, which was recognized immediately and reconnected to breathing circuit. No postoperative hemorrhage, no salivary gland or duct injury were encountered in any patients. In all patients, submental incision scar was almost invisible after 2 months. All patients were satisfied with the aesthetic appearance of the submental scar as well as of aesthetic appearance of nose shape.

DISCUSSION

The aesthetic surgical procedure of the face and neck presents problems of shared airway as well as facial symmetry after conventional oral intubation, while nasal intubation is contraindicated. No consensus exists till date as to which is the best way of securing an airway for such a surgery. For the present study, submental intubation was used for nasal reconstruction surgery–rhinoplasty/rhytidectomy as an alternative with very satisfying results.

Submental intubation technique was first described by Hernandez Altemir, a maxillofacial surgeon in 1986 as an alternative method for intraoperative maxillomandibular fixation in the presence of injuries that preclude nasal intubation, and tracheostomy is not otherwise required

due to its many inherent complications and cosmetic disfigurement.^[1] Many trials have shown that the submental route is simple, quick, and safe approach to the airway management. Although several have used Altimer's technique with good success, but it has potential complications of damage to adjacent structures such as sublingual and submandibular ducts, sublingual gland, and lingual nerve. Now this technique has undergone various modifications with new indications.^[2] MacInnis described the midline incision to avoid injury to the lingual nerve, submandibular duct, and sublingual gland with relatively avascular plane in between the two bellies of the mylohyoid and the anterior bellies of the digastric muscles. The midline approach also allows surgeon to maintain symmetry. Some authors have recommended lateral incision technique through the body of mandible, but it also has risk of injury to the lingual nerve, submandibular duct, or the sublingual gland.^[3]

We have opted for medial approach because there was minimal risk of neurovascular damage and it heals almost imperceptibly with cosmetically superior scar. To prevent kinking of the endotracheal tube, nonkinkable flexometallic tube with removable universal connector was used.

Submental intubation offers a secure airway with efficient ventilation and optimal operating field for surgeon with minimal morbidity. There is avoidance of tracheostomy complication. In aesthetic surgery of face and neck, submental intubation facilitates the simultaneous performance of rhinoplasty, face and neck lift, and lip correction in a one-step procedure under general anesthesia without changing the position of the endotracheal tube.^[4,5] The technique has low reported incidence of complications such as displacement of the tube and accidental extubation. None of our patient had any problems related to tube displacement or accidental extubation; this may be due to proper fixation and use of capnography during the process of conversion of orotracheal to submental intubation and throughout the surgery. Amin *et al.* have also supported the technique of capnography.^[6]

Stranc and Skorachi have reported the development of mucocoele while dissecting mucocutaneous track from the oral side to the skin. No such complication occurred in our series as the track was dissected from exterior to interior.^[7] Postoperative submental scarring has been acceptable irrespective of the approach as it is hidden from direct view in the submental region. Paetkau *et al*

have not suture the submental incision and left it to heal by secondary intension. In our patients, skin incision was always sutured with 3-0 nonabsorbable surgical suture.^[8] Infection, orocutaneous fistula, and postoperative submental scarring are rarely associated with submental intubation.

Contraindications for submental intubation are infection at the site of incision, bleeding disorders, and neoplastic infiltration of the floor of the mouth and neck. Inability to open the mouth was considered a contraindication but Arya *et al.* in 2005 have used the pharyngeal loop assembly for retrograde submental intubation.^[9]

CONCLUSION

The submental intubation is an effective and useful alternative technique of airway management for rhinoplasty and rhytidectomy. The safety and simplicity of the technique required no specialized equipment or technical expertise. It is useful both in the emergency and for elective nasal reconstructive procedures to provide better quality of patients care. The technique has low reported incidence of complications and leaves a cosmetically acceptable scar.

REFERENCES

1. Altimer FH. The submental route for endotracheal intubation. A new technique. *J Maxillofac Surg* 1986;14:64-5
2. Bale DR, Clark M, Jefferson P, Stewart T. Improved submental intubation. *Anaesthesia* 2003;58:189-90.
3. MacInnis E, Baig M. A modified submental approach for oral endotracheal intubation. *Int J Oral Maxillofac Surg* 1999;28:344-6.
4. Green JD, Moore UJ. A modification of submental intubation. *Br J Anaesth* 1996;77:789-91.
5. Patel H. *Anaesthesia for burns, maxillofacial and plastic surgery*. London: Edward Arnold, 1993.
6. Amin M, Dill-Russel P, Manisali M, Lee R, Sinton I. Facial fractures and submental intubation. *Anaesthesia* 2002;57:1195-9.
7. Stranc MF, Skorachi R. A complication of submandibular intubation in a panfacial fracture patient. *J Craniomaxillofac Surg* 2001;29:174-6.
8. Paetkau DJ, Stranc MF, Ong BY. Submental orotracheal intubation for maxillofacial surgery. *Anaesthesiology* 2000;92:912.
9. Arya VK, Kumar A, Makkar SS, Sharma RK. Retrograde submental intubation by pharyngeal loop technique in a patient with faciomaxillary trauma and restricted mouth opening. *Anesth Analg* 2005;100:534-7.

How to cite this article: Gupta K, Sharma D, Gupta PK, Bhatnagar A. Submental intubation: An option of airway management for rhinoplasty and rhytidectomy. *Anesth Essays Res* 2011;5:63-6.

Source of Support: Nil, **Conflict of Interest:** None declared.