

## Use of oral RAE tube for submental intubation - A case report

- Dr Lulu Sherif Mahmood, MD<sup>1</sup>      ■ Dr Natasha Olga Vas, MD<sup>2</sup>  
 ■ Dr Mohandas Bollur Soorappa, MD<sup>3</sup>   ■ Dr Kishan Shetty, MD<sup>4</sup>  
 ■ Dr Prithi Jain, D.A, D.N.B<sup>5</sup>      ■ Dr Manjunath Rai, MDS<sup>6</sup>

### ABSTRACT :

A 38 year old male patient with Le Forte's type 2 fracture was scheduled for maxillofacial surgery. The surgical constraints precluded the use of oral and nasal route of intubation. This case report describes the use of submental route of intubation with oral portex preformed tube and the associated anaesthetic difficulties encountered during the initial part of the surgery.

### KEYWORDS :

Submental intubation, oral RAE tube, desaturation

### INTRODUCTION

Airway management in patients with maxillofacial trauma is a challenge for both the anaesthesiologist and the surgeon, and requires good communication between them.

Detailed discussion with the surgeon regarding securing the airway, route of intubation, type, size and securing of the tracheal tube and alternative methods of intubation is of paramount importance.<sup>1</sup>

*The method of managing an airway that does not interfere with the technical aspect of repair and that which ensures a safe perioperative care must be planned.*<sup>2</sup>

When both nasal and oral intubation are deemed unsuitable, control of the airway can be achieved with submental route of intubation.<sup>3,4,5,6,7</sup> It is a simple, safe and useful technique in maxillofacial trauma which involves exteriorizing

- 1) Assistant Professor, Dept.Of Anesthesiology, Father Muller Medical College, Mangalore.
- 2) Assistant Professor, Dept.Of Anesthesiology, Father Muller Medical College, Mangalore.
- 3) Assistant Professor, Dept.Of Anesthesiology, Father Muller Medical College, Mangalore.
- 4) Associate Professor, Dept.Of Anesthesiology, Father Muller Medical College, Mangalore.
- 5) Associate Professor, Dept.Of Anesthesiology, Father Muller Medical College, Mangalore.
- 6) Consultant, Dept.Of Oral & Maxillofacial Surgery, Father Muller Medical College, Mangalore.

Corresponding Author : Dr.Lulu Sherif MD

Asst.Professor, Dept.Of Anesthesiology, Fr.Muller Medical College, Mangalore  
 Email: lulusherif@gmail.com, Fax: +91 0824-2203904, Phone: +91 9972029972

the free end of an orotracheal tube (universal connector removed) through a submental incision.<sup>8</sup> Ideally, this manoeuvre is performed by using a reinforced tube. Unfortunately, however, some reinforced tracheal tubes are manufactured with nondetachable connectors, thus making it difficult to divert the proximal end of the tube through the floor of the mouth and the submental incision. To overcome this, various other alternative techniques have been reported in literature.<sup>6,9,10</sup> We have not come across any published report using oral portex RAE tube as an alternative to reinforced tubes for submental approach.

In this case report, we document the use of oral preformed RAE tube for submental intubation, the initial desaturation encountered and the successful management of the problem.

## CASE REPORT

A 70 kg male patient aged 30 years with history of alleged road traffic accident was posted for internal fixation of Le Fort's fracture type 2. He also had fracture of the nasal bone. His pre anaesthetic evaluation did not reveal any co morbid illness and the routine investigations were normal. Airway assessment revealed a restricted mouth opening with a Mallampatti scoring of grade 3, dentition was normal, neck extension was restricted, mento hyoid distance was 2 finger breadths. CT scan showed multiple fractures. The patient was kept nil per mouth overnight and was premedicated with Butorphanol 2mg and glycopyrrolate 0.2mg via the intramuscular route. We had decided to secure the airway via the nasal route since there was no basal skull fracture. Just prior to induction the senior consultant surgeon arrived and requested for a submental intubation as he wanted to repair the nasal fracture also. As we were not prepared for a submental route of intubation we had not kept reinforced tube with detachable connectors ready and the flexometallic tubes we had in our operation theatre were the tubes with non

detachable connectors. We then decided to use portex oral preformed RAE tube with detachable connector for submental route. After preoxygenation the patient was induced with Thiopentone 350mg, Fentanyl 75ug and Succinyl choline 75mg. Patient was then intubated with 8mm cuffed Portex preformed oral RAE tube. Tracheal placement of tube was confirmed with bilateral auscultation of chest and by capnography. Anaesthesia was maintained with nitrous oxide in oxygen and vecuronium. The surgeon then made a left submental incision under asepsis, and holding the patient end of the tube in the oral cavity with one hand, he brought the disconnected machine end of the tube through the floor of the mouth and exteriorized it through the submental incision. After confirming bilateral air entry the surgeon fixed the tube with sutures. Oxygen saturation was 100%. The surgeons then painted and draped the head to begin fixation. As the head position was changed for draping, there was a sudden drop in saturation from 100 to 80%. We cut off nitrous and used halothane in oxygen to maintain an FiO<sub>2</sub> of 1. Suctioning of tube was done to clear out blood or mucus held in the tube during exteriorization. The suction catheter passed through the tube freely ruling out any kinking of tube. We performed laryngoscopy again to rule out endobronchial migration of the tube but the tube position showed the tube cuff just below vocal cords. After repositioning the head to midline position, the saturation became 100% again. A tilt of the head to the left again brought a fall in the saturation. This time we suspected a kink at the preformed part of the tube which was lying in the floor of the mouth with tilting of the head. We performed a laryngoscopy again, held the tracheal end of the tube with a Magill forceps, released the sutures which fixed the tube at the submental site and pulled out the tube till the preformed part of the RAE was also exteriorized. The tube was then fixed at that level after confirming bilateral air entry. The oxygen saturation was now 100% and it did not change with the change of head position. Anaesthesia was

maintained with nitrous and oxygen.

Surgery lasted 2 hours and was performed without any untoward problems. After maxillary fixation and nasal repair, the patient was reversed and extubated through the submental site. The wound was sutured under local anaesthesia.

## DISCUSSION

Airway management in complex craniomaxillofacial trauma is often difficult. The choice of intubation technique requires a good assessment from a multidisciplinary team that includes maxillofacial surgeons and anaesthesiologists as well as a good communication between the two.<sup>3</sup>

Nasal endotracheal intubation is often contraindicated in the presence of fracture of the base of skull.<sup>11</sup>

Further, the presence of a nasotracheal tube can interfere with surgical reconstruction of fractures of the nasoorbital ethmoid (NOE) complex.<sup>8</sup>

Surgical reconstruction often involves maxillo-mandibular fixation in the intraoperative period to restore patient's dental occlusion. This precludes the use of oral endotracheal intubation in such cases. In these conditions tracheostomy may be indicated but it carries a significant morbidity. Submental endotracheal intubation has been described as a useful alternative to tracheostomy with minimal complications in these conditions.<sup>3, 4, 7</sup>

Ever since it was first described by Altemir in 1986,<sup>4</sup> the technique of submental intubation has undergone various modifications and found new indications.<sup>5,9,10,12-14</sup> Contraindications for this technique are infection at the site of incision, bleeding diathesis, disrupted laryngotracheal anatomy and a restricted retromolar space to allow suctioning.<sup>15</sup> Complications described with the technique of submental intubation would include the displacement of the tube and consequently, accidental extubation

or endobronchial intubation.<sup>6</sup> Supporting the tube in the oro-pharynx by the surgeon while the tube is being pulled through the track prevent the occurrence of such events. Fixing the tube adequately with sutures at the submental site would also ensure further securing of the tube.

Choosing material and equipment for submental intubation can represent a technical problem. The universal connector of some armoured tubes are designed to be irremovable and may be required to be cut off and the cut edges of the reinforcing wire may need to be trimmed.<sup>6</sup> Green and Moore<sup>9</sup> suggested using two tubes: a conventional oro-tracheal tube securing the patient's airway whereas a second armoured tube is passed through the incision, from exterior to interior. A drawback of this modification is that the cuff of the tracheal tube can be damaged during the vigorous manipulation by the magill forceps.<sup>15</sup> Also, to overcome the problem of the irremovable connector, Drolet and colleagues<sup>10</sup> used a lubricated tube exchanger to replace the submental tracheal tube with a fresh reinforced armoured tube and Amin and colleagues<sup>6</sup> used a 100% silicone wire-reinforced tube with a removable connector, originally designed for use with the intubating laryngeal mask airway.

Careful removal of the fixed connector using a mosquito forceps, before the start of the procedure, can smoothly transform a non detachable connector into an acceptably fitting removable connector.<sup>16</sup>

Arya et al had described the technique of retrograde submental intubation with the help of a pharyngeal loop assembly for the first time in a patient with maxillofacial trauma and restricted mouth opening in whom oral and nasal intubations were not possible and tracheostomy was the only alternative.<sup>17</sup>

Our patient was posted for maxillofacial fixation which precluded the use of oral intubation. He had no basilar skull fracture, so we decided to go ahead with a nasal intubation. In the operation theatre, the senior consultant asked for a submental intubation

as he wanted to repair the nasal pyramid. We had not kept the flexometallic tube with detachable connector ready and we did not want to forcefully remove the non-detachable connector from the flexo metallic tubes we had, fearing a loosely fitted connector during the intra operative period. So we used oral RAE tube for intubation. At this point we would like to highlight the importance of proper communication between the surgeon and the anesthesiologist well ahead of the planned procedure to ensure adequate patient safety and smooth surgical intervention.

Use of a preformed RAE tube for submental

intubation has not been reported in literature so far. Lack of prior experience as to the correct length of fixation of the RAE tube at the submental site; led to the initial desaturation we encountered due to the kinking of the preformed part of the tube in the floor of the mouth during movement of the head. This was rectified by exteriorizing the preformed part of the tube.

We report the successful use of an oral preformed RAE tube for submental intubation as an alternative technique, when the ideal flexometallic tube with a detachable connector is not available.

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