

Fiberoptic Intubation as a Boon in Limited Mouth Opening Surgeries

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ABSTRACT

Surgery of temporomandibular joint ankylosis under general anesthesia poses a great challenge to anesthesiologists. This surgery falls in the category of difficult intubation as direct vocal cord visualization is difficult due to an inability to open the mouth. The present case report suggests that the fiberoptic intubation has become an essential skill for anesthetists dealing with patients in whom orotracheal intubation is anatomically difficult.

Keywords: Temporomandibular joint, Fiberoptic intubation, Ankylosis, Limited mouth opening, Gap arthroplasty.

INTRODUCTION

Surgery of temporomandibular joint ankylosis, under general anesthesia, poses a great challenge to anesthesiologists. This surgery falls in the category of difficult intubation¹⁻³ as direct vocal cord visualization is difficult due to an inability to open the mouth. There is associated retrognathia with a relatively large tongue, and a pseudomacroglossia in a confined space that narrows the pharyngeal passage.⁴ Many patients suffer from obstructive sleep apnea.^{5,6} All of these factors make intubation much more difficult. Options are few and difficult: a blind nasal intubation,⁷ fiberoptic laryngoscope-assisted intubation,^{2,8} binasopharyngeal airway^{9,10} fluoroscope-aided retrograde placement of guide wire for tracheal intubation,¹¹ retrograde endotracheal intubation using a pharyngeal loop,¹² semi blind technique of nasal intubation¹³ and tracheostomy.¹⁴ Blind nasal intubation has high failure rates^{9,15,16} and chances of trauma to the air passage and larynx are high.

Fiberoptic laryngoscope is the best option and is often the gold standard where oral route is impossible. The nasotracheal fiberoptic intubation has certain advantages such as the route to larynx is easier than mouth and also the patient is unable to bite the scope. Most experts agree that awake fiberoptic intubation is the technique of choice with an informed, prepared patient and a trained operator with appropriate equipment. The technique ensures that spontaneous respiration and upper airway tone can be maintained and has been extensively described by others.¹⁷ The literature does provide few complications following the procedure of fiberoptic intubation, such as nasal abrasion and epistaxis which are very rare and mild. Following is a case report where in the surgery for ankylosis took place in a very noninvasive and atraumatic manner.¹⁸

CASE REPORT

A 20-year-old male reported to our department with complaints of restricted mouth opening as little as 6 mm of 6 month duration without significant illnesses (Fig. 1). Systemic examination was within normal limits.

Radiological examination ruled out any significant narrowing of airways and the absence of hypertrophied adenoids (Fig. 2).

- *Preoperative assessment:* With interdental distance = 6 mm and airway assessment Mallampati class IV, the patient was classified as difficult for intubation.
- *Preparation of the nasal mucosa:* For minimal discomfort in awake intubation, the topical anesthesia with 10% lignocaine was sprayed into the nostrils and base of the tongue. Local infiltration into trachea (Fig. 3).
- *Choice of tube:* Soft, flexible and small with internal diameter of 6.5 mm to avoid bleeding.
- *Method of insertion:* Gently advanced slowly through the nose and slid into pharynx in an atraumatic way so as to avoid bleeding which could otherwise obscure the view and lead to failure.

The suggested treatment then was awake fiberoptic intubation. The pros and cons were explained to the patient and an informed consent was obtained from the patient for the same.

After adequate preoxygenation, intravenous induction agents, were infused continuously, to allow for controlled sedation that does not affect airway and breathing. The patient's head and neck was then placed in the 'sniffing position'.^{19,20} The right naris, for intubation was used to pass the endotracheal tube along the floor (inferior aspect) of the nose and oriented to 'aim' at the larynx, making an anterior curve in the endotracheal tube (Fig. 4). The breath sounds were listened to and the tube was advanced into the trachea through the glottis (Fig. 5).



Fig. 1: Assessment of mouth opening



Fig. 4: Intubation through airway

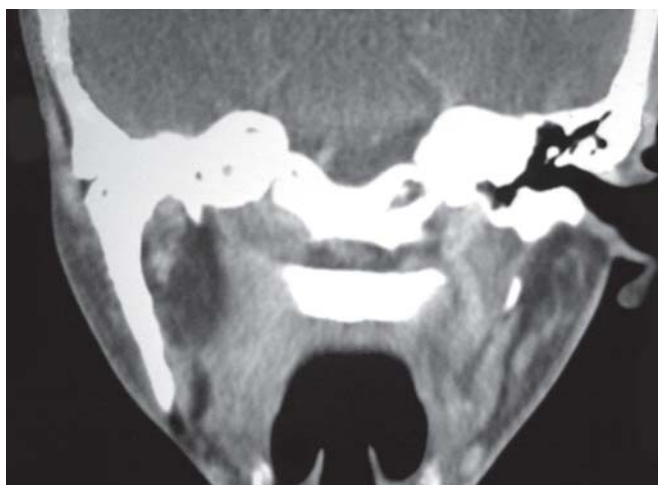


Fig. 2: Coronal CT scan

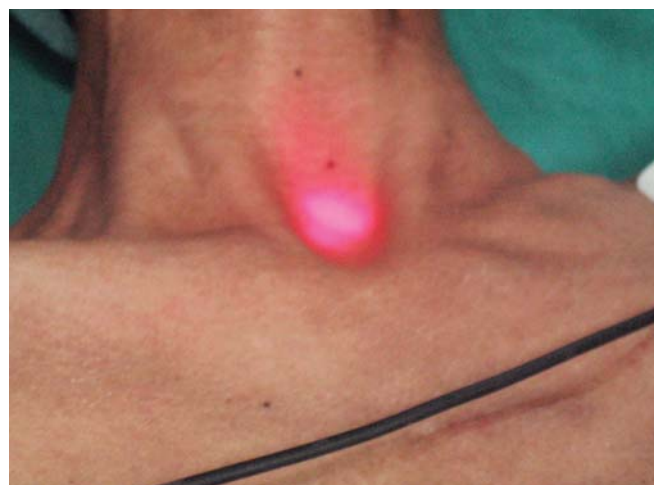


Fig. 5: Intubation through trachea



Fig. 3: Local infiltration

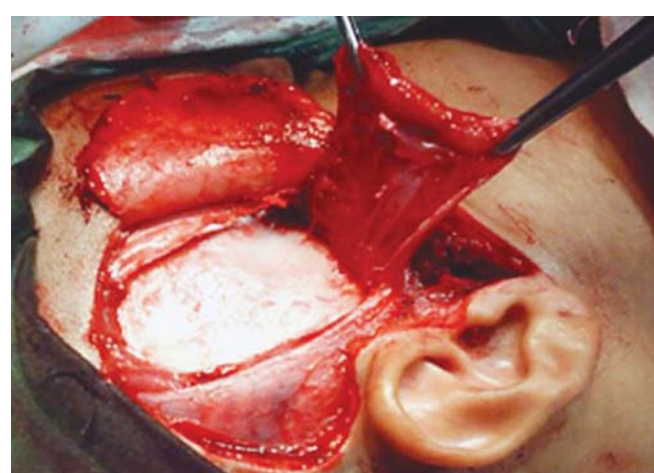


Fig. 6: Gap arthroplasty

Once the tube placement was confirmed, the anesthesia was deepened and long acting muscle relaxants were given. The anesthesia was then continued as usual depending on the requirement and the preferences of the anesthesiologists.

The surgery performed was bilateral gap arthroplasty with interpositional temporalis fascia graft for the correction of ankylosis (Fig. 6). At the end of surgery, adequate suctioning and clearing of secretions, bloods, was done and extubation

was done when the patient was awake and able to maintain airway. Mouth opening achieved was 33 mm after surgery. Post-operatively, the patient recovered uneventfully.

DISCUSSION

Conditions, such as TMJ ankylosis, cause difficult airway management and have become the prime concern of the oral and maxillofacial surgeons during the corrective surgeries. Flexible fiberoptic bronchoscope is the method of choice for coping with difficult tracheal intubations. Although comparative research in this field is rare, most experts agree that awake fiberoptic intubation is the technique of choice with an informed, prepared patient and a trained operator with appropriate equipment. The technique ensures that spontaneous respiration and upper airway tone can be maintained and have been extensively described by other.¹⁷

Fiberoptic intubation is usually more straightforward through the nasal (rather than oral) route and also more advantageous in terms of speed. Considerable skill is required to perform fiberoptic intubation in a limited time frame as rapid emergence from inhalational agent may result in laryngospasm.²¹ Advancement of the nasotracheal tube (NETT) can traumatize nasal passages, causing bleeding, bacteremia, avulsion of a turbinate or even retropharyngeal dissection.²²⁻²⁴ Lubrication, use of a vasoconstrictor, and prewarming of endotracheal tubes (ETT) for softening have been recommended to reduce trauma during nasotracheal intubation.^{23,24,26} Performing a preliminary fiberoptic nasoendoscopy enables the diagnosis or exclusion of intranasal abnormalities and allows the selection of the most patent nostril for intubation resulting in fewer complications.²⁵

Other methods of intubations like blind nasal intubation and retrograde intubation has its own limitation and comparatively more invasive.

In the present case, awake fiberoptic intubation was the choice as it would reduce the risk of aspiration following the topical anesthesia of airway and sedation. Furthermore, in the unconscious patient, reduction of the caliber of the pharyngeal lumen makes fiberoptic visualization more difficult. Extubation in the following case also required great care and neuromuscular monitoring was mandatory.

Apart from using in corrective surgery of ankylosis, the author also used fiberoptic intubation in successfully treating other limiting mouth opening conditions like oral submucous fibrosis, postradiation trismus, post-trauma trismus resulted due to fusion of coronoid process to zygomatic arch also in correction of trismus due to space infection.

CONCLUSION

The success of the present case report suggests that the fiberoptic intubation has become an essential skill for anesthetists dealing with patients in whom orotracheal intubation is anatomically difficult. The use of fiberoptic nasotracheal intubation, though expensive in terms of time and equipment has clearly taken an important place in anesthetic practice and is a safer and better alternative to the classical blind awake nasal intubation technique and tracheostomy.

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