

Anaesthetic Management of a Case of Bilateral TMJ Ankylosis with Previous Tracheostomy Scar

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Abstract: Patients with bilateral temporomandibular joint (TMJ) ankylosis are always a challenge to anesthesiologist in terms of managing the airway. TMJ ankylosis is a difficult airway situation with a severely limited mouth opening. Awake fiber-optic intubation remains as a gold standard method for intubation in such cases. Blind nasal intubation, retro-grade intubation and tracheostomy are the other alternatives, but are associated with considerable morbidity. However, in all awake methods of intubation, patient cooperation is required. We are presenting a case of bilateral TMJ ankylosis with nil mouth opening in a 28 years old male who was posted for condylectomy and interpositional arthroplasty. He had undergone operation twice and had a tracheostomy scar mark. So in this scenario the management of the airway becomes challenging and the patient was intubated successfully by awake fiberoptic intubation method and surgery continued with an uneventful recovery.

Keywords: Bilateral temporomandibular joint ankylosis, tracheostomy scar, fiber optic intubation

INTRODUCTION

Patients with craniofacial disorders can challenge the anesthesiologists for securing airway. The term ankylosis means 'Stiff Joint' in Greek terminology, ankylosis of TMJ may be true (intra-articular) or may be false (extra-articular). The commonest causes of ankylosis are trauma or infection in and around the joint region [1].

The aim of presenting this case is to highlight the difficulty in securing the airway in a case of TMJ ankylosis with nil mouth opening and previous tracheostomy which can cause tracheal stenosis and aggravate a difficult intubation scenario [2]. Hence anesthesiologists should be aware of such a complication and be prepared to combat the situation. These difficulties demand a strict adherence to the basic principle of airway management as the patient requires close observation in post-operative period.

CASE REPORT

A 28 year old patient with bilateral TMJ ankylosis was admitted to Oromaxillofacial surgery department, SCB Medical College for TMJ ankylosis release. During the pre-anaesthetic checkup the history reveals patient had a bike accident 24 years back and suffered injury in both the temporomandibular joint, which gradually progressed to ankylosis of both temporomandibular joint. The patient was operated two times before for TMJ ankylosis release under general

anesthesia. On enquiry for the previous surgery the patient narrated that before surgery he had undergone tracheostomy for safe administration of anesthesia as explained by the then concerned anesthesiologist. The patient was having difficulty in mouth opening since 5 years. For last one year patient was unable to chew and having soft diet only and had become nutritionally compromised. Hence the patient was planned for bilateral TMJ release.

On examination the weight of the patient was 40kg and the height of the patient was 168 cm. pulse rate was 80 per minute and supine blood pressure was 128/80 mm of Hg. No history of allergies, bronchial asthma, epilepsy. Systemic examination was normal.

On airway assessment

- A. Extraoral
 - i. Facial asymmetry- present
 - ii. Receding chin- present
 - iii. Antagonial notches- bilaterally prominent
 - iv. Hypoplastic mandible- present
- B. Intraoral
 - i. Mouth opening-zero
 - ii. Intraoral airway examination could not be done as mouth opening was zero.
- C. Airway
 - i. Mouth opening-zero
 - ii. Temporomandibular joint mobility- nil
 - iii. Neck movement- normal
 - iv. Thyromental distance- 6 cm



Fig. 1: X-ray revealed reduced bilateral temporomandibular joint space

All lab investigations were within normal range. The patient and patient's relatives were counseled regarding the nature of difficult airway and its management options like blind nasal, awake-fiberoptic intubation, retrograde intubation or tracheostomy. Informed consent was taken both from the patient and patient's relative. The ENT surgeons were also asked to present during the procedure for emergency tracheostomy if required. The difficult airway management plan was discussed and decided to proceed with awake fiberoptic intubation. Patient was accepted under ASA class I excepting difficulty in intubation for which risk bonds were taken from the patient and his relatives. The patient was kept nil per oral night before surgery. On the morning of surgery the patient was shifted to operation room, an intravenous line with 18 G cannula was secured and crystalloid was started. All noninvasive monitors such as NIBP, ECG, SPO2 were attached and initial readings were displayed and were within normal limits.

Two drops of 0.1% xylometazoline nasal drops were instilled in both the nostrils and the patient was left for 15 minutes. The patient was premedicated with inj glycopyrrolate (0.2 mg), inj midazolam (2 mg), inj fentanyl (100 µg). The patient was kept in spontaneous ventilation with light sedation.



Fig. 2: The superior laryngeal nerve block

Superior laryngeal nerve block was performed. The patient's skin was cleaned with 5 % betadine solution. The cornu of the hyoid bone was located

below the angle of mandible. The nondominant hand was used to displace the hyoid bone with contralateral pressure, bringing the ipsilateral cornu and the internal branch of the superior laryngeal nerve nearer. Then 25 G needle was inserted and 2 ml of 2% lidocaine without adrenaline was then injected after negative aspiration of blood. Same method was also repeated for the other side also.



Fig. 3: Transtracheal block performed.

Transtacheal block for recurrent laryngeal nerve was also carried out after the cricothyroid membrane was located in the midline of the neck. After sterile skin preparation, the overlying skin was anaesthetized. Then a 22 G needle on a 10 ml syringe with 4 ml of 2% lidocaine without adrenaline was passed perpendicular to the axis of the trachea and pierces the cricothyroid membrane. After the aspiration of air freely into the syringe, instillation of local anaesthetic was performed. This is followed by violent cough which facilitates the spread of local anaesthetic thorough out the tracheal mucosa.

The patient was planned to proceed with fiberoptic bronchoscope in awake condition with spontaneous respiration. Before introducing the fiberoptic bronchoscope into the nostril 2% xylocaine jelly was applied to both the nostrils and the bronchoscope. The fiberoptic intubation attempted by Storz probe with a suction port and an oxygen port through the right nostril.



Fig 4: awake fiberoptic intubation being done



Fig 5: after the patient was intubated and the tube was fixed and the airway secured

There was bleeding in between the procedure which hindered the vision during fiberoptic bronchoscopy, for that reason after 3 failed attempts the glottic opening was visible followed by the carina and then a 7.5 CETT was railroaded. Intubation was confirmed with bilateral chest auscultation and by etCO_2 . ET tube was then connected with breathing circuit. Then inj. propofol 80 mg i.v followed by inj. vecuronium 4 mg was administered and anaesthesia was maintained with $\text{N}_2\text{O} : \text{O}_2$ (50:50) with isoflurane. The patient was hemodynamically stable through-out the surgery. Duration of surgery was 5 hours with minimum blood loss. After the release of bilateral TMJ ankylosis, 3 finger mouth opening was achieved. After the surgery is completed the patient's reflexes were returned and nasopharyngeal and oropharyngeal suction was done. The neuromuscular blockade was reversed with neostigmine (2.5mg) and glycopyrrolate (0.5mg) i.v and after gaining complete consciousness and reflexes the patient was extubated. The recovery from anaesthesia was smooth and uneventful. Then the patient was shifted to the post anaesthesia recovery room. The patient's vitals were within normal limits the patient maintained a patent airway.

DISCUSSION

Always the TMJ ankylosis is challenging for any anaesthesiologist in terms of securing the airway. The TMJ ankylosis patients are anticipated to have difficult intubation [2] because of reduced mouth opening, limited protrusions of their jaw also mandibular hypoplasia can lead to difficult mask ventilation. Normally patients with bilateral TMJ ankylosis patients present with severely reduced mouth opening for which intubation with conventional methods like direct laryngoscopy is not possible. Different methods like fiberoptic bronchoscopy, tracheostomy, blind nasal intubation, retrograde are now a days used for these patients [3]. Fluoroscopic assisted airway intubation [4] and video assisted [5] fiberoptic intubation in temporomandibular joint ankylosis has also been tried.

Awake fiberoptic intubation with regional block with topical anaesthesia in difficult airway is

regarded as a safest approach but it needs patients Cooperation. The topical anaesthesia of airway improved patients acceptance of an airway device are blockage airway reflexes. Awake intubation needs patients co-operation, local blocks for nerves of larynx and topical anaesthesia for upper airway. There is a chance of severe laryngospasm or inability to pass endotracheal tube. Nebulization with 10% Lignocaine also provides topical anaesthesia. Anticholinergic agents reduce secretions, increase intensity & speed of onset & duration of topical anaesthesia [6].

In this case the condition was further complicated by presence of a previous tracheostomy scar mark as a result of previous surgeries, which increased the possibility of difficulty. A number of clinically important airway complications have been documented following tracheostomy. The most frequent complication in these patients is airway obstruction owing to formation of granulation tissue [7]. In this patient there was history of inability in taking food since last 1 year which lead to nutritional compromise; this is also an indication for surgical intervention.

Temporomandibular joint ankylosis results in nil mouth opening which could be unilateral or bilateral. In bilateral TMJ ankylosis facial symmetry is maintained but micrognathia is present as was evident in this case. Bilateral TMJ ankylosis also features as bird faced deformity, receding chin, narrow maxilla, protruding upper incisors with nil or few mms mouth opening. Untreated cases may lead to the following complications malnutrition which becomes an indication for surgery, facial asymmetry, and respiratory distress, and poor oral hygiene, carious or impacted teeth. Increased airway resistance & cor pulmonale may occur [8].

Transnasal fiberoptic guided intubation under sedation or under the influence of inhalational anaesthetics with patient on spontaneous respiration is the safest approach of intubation. Retrograde intubation is difficult to perform if mouth opening is less than 5mm.

Tracheostomy was the last option only in emergency when all other approaches failed. Tracheostomy has its own advantages & disadvantages [3]. Surgical airway should be kept reserved for failed intubation.

In emergency situation cricothyroidotomy provides effective ventilation.

CONCLUSION

In this case we intubated the patient successfully with the use of fiberoptic bronchoscope with local nerve blocks having the patient awake through-out the procedure. The only difficulty we faced the bleeding during the procedure and that obscured our

vision. Considering the nature of difficulty in the airway of this case we think awake fiberoptic bronchoscopic intubation is the safest of all the method available.

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