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Difficult Airway Management In A Patient With Unilateral Temporo Mandibular Joint Ankylosis

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Abstract
Management of patient with tempromandibular ankylosis is challenging for anaesthesiologist. This case report describes the anaesthetic management of temporo mandibular ankylosis patient planned for bone gap arthroplasty (left), coronoidectomy & eminectomy (right) with general anaesthesia and Awake fibre optic nasal intubation.
Keywords: *ventilation difficulty, intubation & extubation.*

Introduction

Airway management in patients with temporomandibular joint (TMJ) ankylosis is an ever challenging situation in spite of a much focused effort for more than a century. Throughout its course of development the technique has evolved from blind nasal intubation, retrograde intubation using a guide wire, intubating with the help of a fibreoptic laryngoscope, and the time tested tracheostomy.

Ankylosis of the Temporomandibular joint refers to restricted mandibular movements (hypomobility) with deviation to the affected side on opening of the mouth.

Affects all age groups

- There's equal male and female distribution
- More common in Asian subcontinent

Classifications - Bilateral or Unilateral ankylosis

- Fibrous ankylosis or Bony ankylosis
- Intra-articular or Extra-articular ankylosis
- Complete or Partial ankylosis
- True or false ankylosis

Aetiology

Trauma -At birth (with forceps), Blow to the chin (causing haemarthrosis), Condylar fracture (RTA injury)

Infections and Inflammatory -Rheumatoid Arthrits, Septic arthritis, Otitis media, Mastoditis, Parotitis, Osteoarthritis.

Systemic diseases like Small pox, Ankylosing spondylitis, Syphilis, Typhoid fever, Scarlet fever.

Others –Malignancies, Post radiology, Post surgery (untreated trauma).

Case Report

A 23 year old, 58 kg male was posted for release of unilateral left sided temporomandibular joint ankylosis. He gave a history of RTA injury 8 months back. He had difficulty in mouth opening since 8 months and complete inability to open his mouth since 6 months. He had no surgical history. There was no other significant history and no complaints related to the eye, gastrointestinal, cardiovascular or central nervous systems. There was no history of addiction.

On examination, mouth opening was 3 mm. Neck movements were restricted due to pain. His pulse was 86 per min, regular, blood pressure was 120/80 mmHg. Heart sounds were normal, and no murmurs on auscultation. Air entry was bilaterally equal, there were no adventisious sounds. Examination of the eye, central nervous and gastrointestinal systems revealed no abnormality. His preoperative investigations were: Hb of 9.8gm%, ESR 15 mm, BUN 7 mg%, serum albumin 3.6 mg%. No pulmonary or tracheobronchial abnormality was seen in CXR. Pulmonary function tests could not be done since mouth opening was 3mm. ABG showed PH 7.43, PaO_2 88mmHg, $PaCO_2$ 35mmHg, HCO3 23.7 mEq/l. Nasal fibreoptic endoscopy revealed a right deviated nasal septum with left inferior turbinate hypertrophy with bilateral spurs.

Anaesthetic management

We decided to perform a [1]flexible fibreoptic guided awake nasal intubation. Informed consent was obtained for awake intubation and postoperative ventilatory support. Standby tracheostomy and jet ventilation were kept ready. An I.V. line was secured and infusion of DNS was started and antibiotic prophylaxis administered. The patient was shifted to the OT table with great care. After attaching monitors, such as, pulse oximeter, and non-invasive blood pressure (large size cuff) monitor, 3 lead ECG, Foley's catheter for intraop urine output. Two drops of xylometazoline were instilled into the more patent right nostril. The upper airway was anesthetized using right nasal packing with freshly prepared adrenalized 4% lignocaine, 2% viscous gargles and bilateral superior laryngeal nerve block with 2 ml of 2% adrenalized lignocaine on each side. Patient was preoxygenated with 100% oxygen for 5 minutes and premedicated with fentanyl 1 µg/kg i.v., midazolam 0.03 mg/kg i.v., ondansetron 4mg iv, ranitidine 50mg i.v. and glycopyrrolate 0.2 mg i.v. The ability to ventilate the lungs by mask was confirmed. A 8.0 mm ET tube was threaded over the flexible fiberoptic bronchoscope, the scope was carefully introduced through the right nostril and maneuvered through the vocal cords. The distal end of the fiberscope was advanced into the larynx and ETT was advanced into the trachea. Fiberscope was then removed while structures of carina, trachea and tracheal tube were observed and ETT secured in position. The endotracheal position of the tube was confirmed by capnography and bilateral chest auscultation. The eyes were taped shut and padded. The patient was given xylocard 1.5 mg/kg iv and induced with propofol 2 mg/kg i.v. fentanyl 1 µg/kg/hr, isoflurane 1MAC., and vecuronium 0.01 mg/kg/h i.v.A intraoral pack was placed to prevent aspiration by using direct laryngoscope. The patient was ventilated with volume control mode with a tidal volume of 550 mL at 16 breaths per min. Initial reading of $ETCO_2$ was 36 – 38 mmHg, which was constantly monitored. Release of left temporomandibular joint ankylosis with interpositional arthroplasty using temporalis muscle flap was done. Total oral opening of 35mm was achieved. Intraoral coronoidectomy was done on the right side. Total operating time was 4.5 hours and blood loss was around 200ml. Intraoperative I.V fluids were maintained. At the end of surgery a direct laryngoscopy was done, intra oral pack was removed and epiglottis was visualized. Intraoperative course was uneventful.

At the end of the surgery, N_2O was stopped 10 min prior and xylocard 1mg/kg IV was given. Neuromuscular blockade was reversed with neostigmine 2.5mg and glycopyrolate 0.5 mg and patient was extubated under direct laryngoscope after thorough suctioning after, when patient was fully awake and obeying commands. After extubation patient was observed on the OT table 15 minutes for any untoward event, His vitals remained stable and saturation was normal. He was transferred to the ICU for monitoring and was kept in propped up position, He maintained oxygen saturation between 98-100% and was hemodynamically stable. Post op analgesia was maintained with diclofenac 75mg iv bd. After 2days he was transferred back to the ward and further post op period was uneventful and he was discharged on 7th post op day.

Discussion

There are few methods that ensure a safe, uneventful intubation in a TMJ ankylosis patient with a difficult airway. The technique of retrograde intubation was originally described in 1960.[2] There has been several modifications in this technique throughout these years.[3,4] Fluroscopy was used to assist in placing the guide wire in retrograde technique especially in patients with difficult mouth opening.[5] Use of flexible fibreoptic laryngoscope may be the method of choice in difficult airway. In the presence of bleeding this may also end up in failure.[6]In many centers the fiberoptic scope may not be available. Alternative options will be necessary in such situations. In TMJ ankylosis the technique of blind nasal intubation was traditionally recommended.[7]It can fail and repeated attempts may injure the involved structures resulting in complications like bleeding airway obstruction etc. In our patient blind nasal intubation was not possible as patient was not co-operative. In addition, repeated unsuccessful attempts could cause soft tissue trauma. Keeping this in mind, we decided to perform a flexible fibreoptic guided intubation rather than a blind nasal intubation. Sedative premedication was withheld till the airway was secured. Since clinical tests to identify the more patent nostril can be erroneous, [5] it is our practice to routinely perform a flexible fibreoptic nasal endoscopy for all patients requiring nasal intubation. Inadvertent intubaton of nostrils with septal or other deformities may be associated with an increased risk of complications like mucosal tearing or avulsions of inferior and middle turbinate. Our patient had a more patent right nostril so we decided to perform a right nasal intubation. A variety of techniques for the management of temporomandibular ankylosis[6] have been described. These include gap arthroplasty, interpositional arthroplasty and more recently subankylotic osteotomy with creation of a functional pseudoarthrosis. A coronoidectomy is only performed in cases of long standing ankylosis where passive mouth opening following surgery on the side of ankylosis is inadequate.

Conclusion

When a patient is posted for release of temporomandibular joint ankylosis, a fibreoptic guided awake nasal intubation is a safer and better alternative to the classical blind awake nasal intubation technique.

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