



Anaesthesiology

ANESTHETIC MANAGEMENT OF PEDIATRIC PATIENT WITH BILATERAL SEVERE TEMPOROMANDIBULAR JOINT ANKYLOSIS : A CASE REPORT.

Dr. Dikshit Chunilal Pansuriya	2nd Year Resident Anesthesiology
Dr. Mandakinee Thacker	Head And Professor - Anesthesiology
Dr. Jaldeep Patel	Professor - Anesthesiology
Dr. Vaibhav Vansola	2nd Year Resident Anesthesiology

ABSTRACT The temporomandibular joints (TMJ) are highly specialized bilateral joint comprising an articulation between squamous part of temporal bone and the head of mandibular condyle. Craniofacial deformities include mandibular hypoplasia, maxillary hypoplasia, mandibular space reduction with soft tissue overload. A small mouth opening and limitation in jaw protrusion are predictor of difficult airway in such patients. A relatively difficult problem is aggravated in the age group of children due to the small mouth opening and lack of co-operation. A child with severe temporomandibular joint ankylosis (TMJA) with a small mouth opening that required surgical repair under general anesthesia. In our case, intubation was performed with a 5.5 cuffed endotracheal tube using an Ambu® Ascope™ 4 Bronchoscope Slim (3.8/1.2) under inhalation anesthesia.

KEYWORDS : Temporomandibular joint (TMJ), Temporomandibular joint ankylosis(TMJA), Difficult airway, Inhalation anesthesia, Fiberoptic intubation.

INTRODUCTION :

The temporomandibular joint(TMJ), also known as the craniomandibular joint. It is the articulation between the squamous part of the temporal bone and the head of the mandibular condyle.^[1] Ankylosis is a Greek term meaning " stiff joint ". It can be defined as " inability to open mouth due to either a fibrous or bony union between the head of the condyle and the glenoid fossa ".^[2] The definite cause of ankylosis of TMJ is unknown. The two main contributing factors to the ankylosis are trauma and infection in or around the joint region.^[1] Temporomandibular joint ankylosis (TMJA) interferes with chewing, speech, oral hygiene, growth & development and solid diet. Anesthetic management of children with craniofacial deformities presents a unique challenge because soft tissue and bony anomalies can affect the airway and influence airway management.^[3] TMJA with mandibular hypoplasia is a major problem in airway management. A relatively difficult problem is aggravated in the age group of children due to the small mouth opening and lack of co-operation.^[2] Anesthesia management therefore becomes a real challenge for the anesthesiologist in managing such difficult airways.^[2] In this case report, fiberoptic intubation in a pediatric patient with bilateral severe temporomandibular joint ankylosis.

Case Report :

A 5 years old girl of 10 kgs weight, presented ENT department OPD with small mouth opening since birth. The patient could not chew and ate only a soft diet (liquid). She was a diagnosed with bilateral severe temporomandibular joint ankylosis.(TMJA) She was planned to undergo bilateral condylotomy and left side Coronoidectomy with cartilage interposition under general anesthesia. According to the preoperative evaluation, the child was healthy and there were no comorbid condition. Airway examination revealed complete immobility of the mandible. The mouth opening was decreased and mallampatti grade was IV. Neck movement was normal with normal thyromental distance. The patient was vitally stable. Systemic examination (respiratory system and cardiovascular system) were normal. All haematological and biochemical tests were within normal limit. CT scan face showed skeletal dysplasia of mandible ramus with bilateral temporomandibular joint ankylosis with probable being fibrous dysplasia. The child parents were informed about the nature of difficult airway and their management option with fiberoptic intubation and tracheostomy. From which fiberoptic intubation was more convenient. Informed consent was obtained from the patient parents. Fiberoptic nasal intubation under sedation was planned for the patient because she was uncooperative child with difficult airway due to small mouth opening and limited jaw movement at TMJ.

Anesthetic Management :

Preoperative evaluation led to the decision for surgery under ASA I classification. Preoperative fasting was confirmed. Preoperative planning was conducted to secure the airway in anticipation of potential technical intubation challenges, following the difficult airway algorithm outlined by the American Society of Anaesthesiologists (ASA).

An IV line was secured and vital parameters such as Heart Rate, SpO₂, ECG were monitored. Premedication Inj. Ondansetron 0.8mg iv , Inj. Glycopyrrolate 0.04mg iv was given. Anxiolysis was achieved with incremental dose of Inj. Midazolam 0.2mg IV. After checking patency of nares, 2 drops of xylometazoline nasal drops were put in the nostril. Nebulization with 4% lignocaine 4ml for 10 min was given.

Anesthesia was induced with sevoflurane in 100% O₂ while the patient was breathing spontaneously. After confirmation of mask ventilation, the concentration of sevoflurane was increased to 5%. On attempting intubation, the mouth could not opened more than 2mm. we therefore decided to try nasal intubation using Ambu® Ascope™ 4 Bronchoscope Slim (3.8/1.2). The fiberoptic Bronchoscope was mounted with 5.5mm cuffed ETT and inserted through the right nostril proceeding until the vocal cord were visualised. The fiberoptic Bronchoscope was advanced beyond the vocal cords until carina was visualised at which point the ETT was advanced along with lignocaine using spray as-you-go technique. Under vision, the scope was withdrawn and placement confirmed with capnography and auscultation.

Anesthesia was induced with Fentanyl 2mcg/kg and already sevoflurane has done the work. During surgery, Anesthesia was maintained with O₂, N₂O with Sevoflurane. Muscle relaxation was maintained with Inj. Atracurium 0.1mg/kg was given.(Intermittent boluses) Vital parameters were maintained to the pre operative levels. Bilateral condylotomy and left side coronoidectomy with cartilage interposition were performed. The surgical procedure went upto 2 hours eventfully. After the surgeon confirming inter incisor gap of >45mm, nasotracheal and oropharyngeal suctioning was performed. At the end of surgery, the residual neuromuscular blockade were reversed with Inj. Neostigmine 0.5mg and Inj. Glycopyrrolate 0.1mg iv was given. Post operative hospital stay was uneventful.

DISCUSSION :

Temporomandibular joint dysfunction is often associated with unilateral or bilateral arthritis that limits mouth opening. The incident of difficult airway is 1-3%. TMJ ankylosis is the a fusion of the mandibular condyle with the glenoid fossa, obliterating the normal articulation and makes the mandible immobile.^[2] The causes of TMJA

can be congenital (forceps delivery), traumatic, infectious and idiopathic.^[1] Children with TMJA are unable to chew solid foods, leads to nutritional compromise and is usually an indication for surgical intervention.^[4]

Children with TMJA are expected to have difficult intubation due to their small mouth opening and limited protrusion of lower jaw.^[5] The difficult intubation in TMJA in children result from severe trismus, associated mandibular hypoplasia, maxillary hypoplasia, mandibular space reduction with soft tissue overload. Because the child has facial asymmetry, the position of the larynx can be changed. so direct laryngoscopy is usually not possible.^[6] Endotracheal intubation in patients with altered airway always remain a challenge for the anesthesiologist.

The patient with zero or limited mouth opening, intubation options include blind nasal intubation, capnography mediated awake blind nasal intubation, retrograde intubation technique through cricothyroid puncture, awake fiberoptic bronchoscope Intubation and elective tracheostomy. Tracheostomy is generally a last resort in pediatric age group due to the high incidence of associated complications.^[7] Awake fiberoptic intubation of spontaneously breathing patient is the gold standard and the technique of choice in the management of anticipated difficult airways. However, patient co-operation is essential, so it is not an ideal option for children.^[8]

The awake fiberoptic intubation required time and through patient preparation including adequate oxygenation and well titrated sedation according to patients need. Induction of anesthesia can be either intravenous or inhalation. Intravenous anesthesia can cause sudden loss of airway control and apnea which can lead to inability to intubate or ventilate.^[9] Inhalation induction is preferred because spontaneous breathing can be maintained. Sevoflurane has been shown to be a useful agent for inhalation induction.^[10] Maintaining of oxygenation is the main goal if the patient breathing spontaneously and always responding to command in adult. But in our case judicious use of sedation was preferred as child non compliance was expected. The nasotracheal approach to fiberoptic intubation is often easier than the oral approach because the instruments are directed directly into the glottis due to the natural anatomical airway. Proper planning and ascertain with attention to details are keys to patients compliance and high success rate. It is suitable for all age groups and has an excellent patient acceptance.

CONCLUSION :

In case of bilateral temporomandibular joint ankylosis with high risk of airway control due to small mouth opening, skillful fiberoptic bronchoscopic nasotracheal intubation is considered a safe procedure.

REFERENCES:

1. Malik NA. Text book of oral and maxillofacial surgery. New Delhi: Jaypee Brothers Medical Publishers; 2002; 265-300.
2. Sahoo TK, Patil Y, Patel RD, Dewoolkar LV. Anaesthetic management of a child with temporomandibular joint ankylosis with extrahepatic portal vein obstruction for ankylosis release. *Internet J Anesthesiol* 2008; 16:1.
3. Ali Asghar, Faisal Shamim, Asiyah Aman. Fiberoptic intubation in a paediatric patients with severe temporomandibular joint (TMJ) ankylosis. *Journal of the college of physician and surgeons pakistan* 2012, vol. 22 (12); 783-765.
4. Yuill E, Howitt SD. Temporomandibular joint: conservative care of TMJ dysfunction in a competitive swimmer. *I Can Chiropr, Assoc* 2009; 53:165-72.
5. Weiss M, Engelhardt T. Proposal for the management of the unexpected difficult paediatric airway. *Pediatric Anesth* 2010; 20:454-54.
6. Dasgupta D. Endotracheal intubation in bilateral temporomandibular joint ankylosis. *Indian J Anaesthesia* 1987; 35: 367- 373.
7. Abdullah VJ, Mox JS, Chan HB, Chan KM, Hasselt VC: Paediatric tracheostomy. *HKJ Paediatr* 2003; 8:283-9.
8. Xue FS, Luo MP, Xu YC, Lio X. Airway anaesthesia for awake fiberoptic intubation in management of paediatric difficult airways. *Paediatr Anaesth* 2010; 20:1264-5.
9. Schaeuble J, Heidegger T, Gerig HJ, Ulrich 8, Schneider TW. Comparison of etomidate and propofol for fiberoptic intubation as part of an airway management algorithm: a prospective, randomized, double-blind study. *Eur J Anaesthesiol* 2005; 22: 762-7.
10. Pean D, Floch H, Beliard C, Piot B, Testa S, Bazin V, et al. Propofol versus sevoflurane for fiberoptic intubation under spontaneous breathing anaesthesia in patients difficult to intubate. *Minerva Anesthesiologica* 2010; 76:780-6.