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Fiberoptic Intubation in a Paediatric Patient with Severe Temporomandibular Joint (TMJ) Ankylosis

Ali Asghar, Faisal Shamim and Asiyah Aman

ABSTRACT

Craniofacial abnormalities are associated with mandibular hypoplasia, reduced mandibular space with overcrowding of soft tissues and maxillary hypoplasia. Decreased mouth opening and limitation in jaw protrusion are independent predictors of difficult airway in such patients. The relative difficult problem becomes even graver in the paediatric age group because of their small mouth opening and un-cooperativeness. A child with severe temporomandibular joint (TMJ) ankylosis presented with negligible mouth opening and required surgical correction under general anaesthesia. Successful intubation was performed with endotracheal tube size 5.5 mm using an adult 4.3 mm fiberoptic bronchoscope under inhalational as well as topical anaesthesia.

Key words: Temporomandibular joint ankylosis. Airway management. Fiberoptic intubation. Topical anaesthesia.

INTRODUCTION

The anaesthetic management of children with craniofacial abnormalities often presents with unique problems because soft tissue and bony abnormalities can affect the airway and influence airway management.¹ The temporomandibular joints (TMJ) are highly specialized bilateral joint comprising an articulation between the cranium and mandible. TMJ ankylosis especially with mandible hypoplasia presents a serious problem for airway management.¹ The relative difficult problem becomes even graver in the paediatric age group because of their small mouth opening and un-cooperativeness. Therefore, it becomes a real challenge for the anaesthesiologist to manage such type of difficult airways.

The present case describes fiberoptic intubation in one such case.

CASE REPORT

An 11 years old girl, weighing 32 kg, presented in the dental clinic with limited mouth opening. She was a diagnosed case of bilateral temporomandibular joint (TMJ) ankylosis for which she had a surgery (bilateral costochondral grafts, fixed on mandible in place of condyles) at 2 years of age. After first surgery, her mouth opening had become adequate but then gradually reduced again and since last 2 years, the patient was unable to chew and taking soft diet only. She was

planned to undergo bilateral gap arthroplasty with left sided coronoidectomy under general anaesthesia.

In pre-operative assessment, child was otherwise healthy with no comorbid condition. The airway examination revealed a total ankylosis with complete immobility of the mandible. The mouth opening (interincisor gap - 3 mm) is severely reduced and mallampati class was grade IV. She also had receding chin and prominent upper incisors (Figure 1). She was asked to breath from one nostril and closing the other in order to quantify the nasal patency on each side.

All laboratory investigations were within normal range. CT scan of face showed skeleton dysplasia of mandible ramus with bilateral temporomandible joint ankylosis and likelihood of being fibrous dysplasia. The child and parents were counselled regarding the nature of difficult airway and its management options like fiberoptic intubation and tracheostomy. Informed consent was taken from child's parents. The dental surgical team was communicated to make sure the presence of ENT surgeon in the operating room for emergency tracheostomy. No sedative pre-medication was given to avoid any airway obstruction.

The difficult airway management plan was discussed and decided to proceed with awake fiberoptic intubation

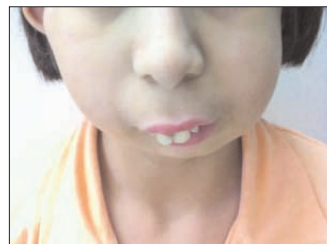


Figure 1: Reduced mouth opening and receding chin with prominent incisors.



Figure 2: Nasal endotracheal tube connected to anaesthetic breathing circuit.

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under regional anaesthesia. Difficult airway management equipment, adult fiberoptic bronchoscope (Olympus OD 4.3 mm) with light source, resuscitation drugs and presence of help were ensured. In the pre-operative area, two drops of nasal vasoconstrictor (Xylometazoline) was instilled in each nostril and she was nebulized with lignocaine 1:400000 (2.5 ml) for fifteen minutes.

After taking the patient in operating room, standard ASA monitoring (ECG, NIBP and SpO₂), was applied. An 18 gauge intravenous cannula was placed on left hand and Ringer's lactate started as maintenance fluid. Initially, it was planned to proceed with fiberoptic bronchoscope (FOB) in awake condition but child became un-cooperative in the OR, so inhalational induction was started with Sevoflurane in 100% oxygen. Concentration of Sevoflurane gradually increased while preserving spontaneous breathing. A nasal airway size 28 with lubricating gel was put in left nostril and the breathing circuit was attached with it through endotracheal tube (ETT) connector. After assuring adequate spontaneous ventilation through nasal airway, fiberoptic bronchoscope was then passed through the right nostril. The vocal cords were visualized and FOB advanced into trachea to locate carina. Child did not show any reflex response to the insertion of bronchoscope because of well anaesthetized airway with topical local anaesthetics. The endotracheal tube size 5.5 mm was advanced over bronchoscope in the trachea and its position above the carina was confirmed. The ETT was then connected to anaesthetic breathing circuit (Figure 2) and the correct placement of tube in the trachea was confirmed by end tidal carbon dioxide (ETCO₂) and bilateral chest auscultation. Atracurium 15 mg was used for muscle relaxation and intravenous Pethedine 30 mg along with intravenous paracetamol 450 mg were given for analgesia. Anaesthesia was maintained with isoflurane 1% in 40:60 oxygen and nitrous oxide. Duration of surgery was 4 hours, blood loss was not significant and a mouth opening of nearly 1 – 1.5 cm was achieved. At the end of surgery, nasotracheal and oropharyngeal suctioning was done and residual neuromuscular blockade was reversed with neostigmine 1.6 mg and 0.65 mg atropine. The child was allowed to regain complete consciousness and reflexes, and then he was extubated. She was shifted to recovery room and her postoperative vitals were within normal limits. She was breathing spontaneously on 4 liters of oxygen and maintained patent airway.

DISCUSSION

Ankylosis is defined as an abnormal stiffening of a joint caused by bone disease, injury or surgery.² Because of stiffening, joint mobility is reduced leading to compromised function. Ankylosis of temporomandibular joint is due to either fibrous or bony union between head

of condyle and glenoid cavity. Bilateral temporomandibular joint ankylosis severely compromise jaw function but such cases are rare.³ It can be congenital or idiopathic. Forceps delivery, trauma and infection are causative factors. Inability to chew solid foods leads to nutritional compromise and this usually becomes an indication for surgical intervention.³

Children with TMJ ankylosis are anticipated to have difficult intubation because of reduced mouth opening and limited protrusion of lower jaw. Mandibular hypoplasia and unequal growth of two halves of mandible makes mask ventilation difficult as well.⁴ In developing countries, children having TMJ ankylosis present at later stages with severely reduced mouth opening. By which time, conventional method of intubation with direct laryngoscopy is usually not possible. Different methods for airway management like tracheostomy, blind nasal intubation and fiberoptic intubation are mentioned in literature. Tracheostomy is usually considered as last option in paediatric age group because of high incidence of complications associated with it.⁵

Awake fiberoptic intubation with topical anaesthesia in anticipated difficult airway is regarded as the safest approach but patient's co-operation is essential, so it is not an ideal option for children.⁶ This also happened in our case that the child became un-cooperative on the table, although she was relatively young with good intellectual level and that was the reason of opting awake FOB intubation. Topical anaesthesia of airway improves child's acceptance of an airway device and blocks airway reflexes. It can be used as a sole technique or in conjunction with either inhalational or intravenous induction. Lignocaine 10% spray is highly effective and care should be taken not to exceed the toxic dose limit. Nebulized lignocaine (4%) is particularly useful and can be used pre-operatively or during induction with an inline attachment for nebulization to the anaesthetic circuit.⁷

Induction of anaesthesia can be either intravenous or inhalational. Intravenous anaesthetics can precipitate sudden loss of airway control and apnea, which may result in can not intubate or ventilate situation.⁸ Inhalational induction is preferred as spontaneous breathing can be preserved by this method. Sevoflurane has been shown to be a useful agent for inhalational induction, as it has a blood gas solubility of 0.69 and is least irritating to the airway. It has been used for the management of difficult paediatric and adult airway and has an important role because the depth of anaesthesia can be rapidly altered and the patient can be awakened if airway cannot be controlled.⁹ In this patient, the inspired concentration of sevoflurane was initially increased gradually to 8% and an end-expired concentration of 5% was achieved before bronchoscopy. Although partial or nearly complete airway obstruction

did occur during induction, this was effectively relieved by airway maneuvers, use of an artificial airway and changing the patient's position. There were no episodes of breath-holding and coughing at any stage and spontaneous breathing was well maintained. This suggests that adequate depth of anaesthesia can be achieved without loss of airway control.

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REFERENCES

1. 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.
2. Malik NA. Text book of oral and maxillofacial surgery. New Delhi: Jaypee Brothers Medical Publishers; 2002.
3. Yuill E, Howitt SD. Temporomandibular joint: conservative care of TMJ dysfunction in a competitive swimmer. *J Can Chiropr Assoc* 2009; **53**:165-72.
4. Weiss M, Engelhardt T. Proposal for the management of the unexpected difficult paediatric airway. *Pediatric Anesth* 2010; **20**:454-64.
5. Abdullah VJ, Mox JS, Chan HB, Chan KM, Hasselt VC. Paediatric tracheostomy. *H K J Paediatr* 2003; **8**:283-9.
6. 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.
7. Kundra P, Krishnan H. Airway management in children. *Indian J Anaesth* 2005; **49**:300-7.
8. Schaeuble J, Heidegger T, Gerig HJ, Ulrich B, 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.
9. 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 Anestesiologica* 2010; **76**:780-6.

