

## *Case report*

# **Adult sized fiberoptic bronchoscope aided nasal intubation in a child with left sided temporomandibular joint ankylosis**

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### **Abstract**

In temporomandibular joint (TMJ) ankylosis, direct laryngoscopy and intubation are not feasible. The scenario becomes more challenging in paediatric patients. The best technique would be fiberoptic bronchoscope (FOB) aided nasal intubation. We report successful nasal intubation with the aid of orally placed adult sized fiberoptic bronchoscope in a child with a limited mouth opening. A 6-yr-old child was brought with history of inability to open the mouth. Diagnosis of left sided TMJ ankylosis was made and interpositional arthroplasty was planned. Airway examination revealed interincisor gap of 4.6 mm. Due to tooth decay, a maximum mouth opening of 5.2 mm was observed on the left side. The airway was successfully secured through the nasal route aided by the adult sized bronchoscope inserted orally through the gap between the eroded upper and the lower teeth. Adult sized fiberoptic bronchoscope may be useful in aiding nasal intubation in pediatric patients if the mouth opening permits its introduction orally.

**Keywords:** ankylosis, fiberoptic, nasal intubation, paediatric, temporomandibular joint

### **Introduction**

Ankylosis of the temporomandibular joint (TMJ) impairs the movement between the mandibular condyles and the temporal bone. There is grossly reduced mouth opening which makes managing the airway difficult for the anaesthesiologists as direct laryngoscopy and intubation are not feasible. The scenario becomes even more challenging in paediatric age group because of lack of cooperation and difficult airway anatomy. The best technique in such situation would be fiberoptic bronchoscope (FOB) aided nasal intubation. However, the paediatric sized FOB is not available in all centers. We report successful nasal intubation with the aid of orally placed adult sized FOB in a child with a limited mouth opening.

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### **Case Report**

A 6 year old male child weighing 18 kg was brought to the hospital with history of inability to open the mouth for 2 years. Based on clinical and radiological evaluation a diagnosis of post-infective left sided TMJ ankylosis was made and interpositional arthroplasty was planned under general anaesthesia. Airway examination revealed patent both the nostrils, interincisor gap of 4.6 mm, and unrestricted neck movement. Due to decay of the upper left second incisor tooth a maximum mouth opening of 5.2 mm was observed on the left side.

Vitals, findings of other systemic examination and investigations were unremarkable. With anticipated difficult intubation, and unavailability of pediatric sized FOB, nasal

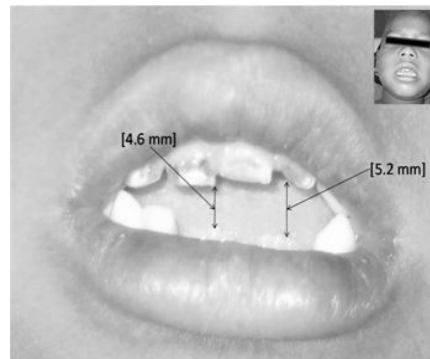
Intubation under adult sized FOB guidance after inhalational induction of anaesthesia with halothane was planned. The procedure was explained to the child's parents and informed

consent for the procedure and tracheostomy were obtained.

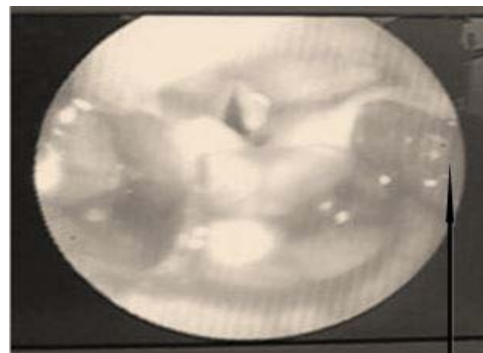
As planned anaesthesia was induced with incremental concentration of halothane (up to 3%) in 100% oxygen through an Ayre's T-piece with Jackson - Rees' modification. Following adequate depth of anaesthesia, a lubricated 4.5 mm uncuffed PVC endotracheal tube (ETT) was inserted through the right nostril and with the tip placed in the nasopharynx. Anaesthesia was maintained with oxygen and halothane with the patient breathing spontaneously through the anaesthesia circuit connected to the ETT. An adult FOB (KARL STORZ-endoskope, Germany) with an external diameter of 4.8mm was introduced through the maximal oral opening. Once the glottic area was visualized on the video monitor, second anaesthesiologist manipulated the ETT placed in the nasopharynx and tried to advance through the vocal cords under vision. But the tip of the ETT impinged on the right arytenoid causing difficulty in passing the ETT, despite external laryngeal manipulation (figure 2).

After initial two unsuccessful attempts, ETT and FOB both were removed out gently. Mask ventilation was resumed and anaesthesia was deepened further. A metallic stylet was placed on the 4.5 mm ETT and the distal end was bent to give a J-shaped angulation (figure 3). With the same aforementioned technique, the ETT was approached towards vocal cord and we could successfully intubate the trachea.

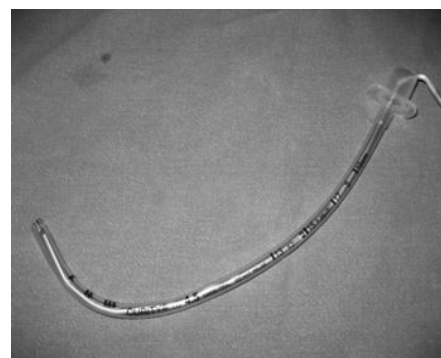
The FOB was removed, and correct placement of ETT was confirmed by auscultation and capnography. Anaesthesia was maintained using a mixture of O<sub>2</sub> and halothane, with vecuronium bromide 2 mg and Pethidine 14mg intravenously. At the end of surgery, neuromuscular blockade was reversed and the trachea was extubated. The postoperative period was uneventful.



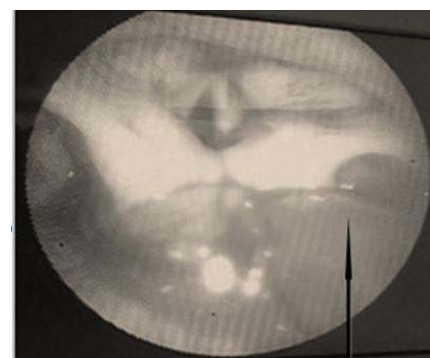
**Figure 1:** Child with limited mouth opening



**Figure 2:** Attempt of ETT placement without stylet



**Figure 3:** ETT in "J" shaped angulation with stylet



**Figure 4:** ETT with stylet approaching towards glottis

## Discussion

In a child with TMJ ankylosis, endotracheal intubation using paediatric FOB is the technique of choice. In the absence of a pediatric FOB, various techniques and modification have been described to secure airway.<sup>1,2,3</sup> Adult FOB introduced through the contralateral nares to facilitate nasotracheal intubation in children has been described.<sup>4</sup> Attempting similar approach could have been one option in our case also but the available fiberoptic bronchoscope seemed far too big to be introduced through the nares of the child risking further compromise of an already compromised airway. Moreover, the gap provided by the eroded left upper incisor tooth in addition to the limited mouth opening in the child provided us an alternative route for introducing the fiberscope to guide the intubation.

Expectedly the ETT snugly passed through the right nostril and the FOB through the gap orally. With the technique we employed one may encounter difficulty during ETT advancement due to improper alignment of the ETT with the glottis as in our case. We had difficulty in passing the ETT due to impingement of ETT tip on the right arytenoids because of the relatively more cephalad position of the larynx in the child. The problem may be overcome with the help of styletted ETT bent to J-shaped angulation at the tip as in our case. An extra oral approach condylectomy under total intravenous anesthesia initially and later tracheal intubation under direct laryngoscopy has been described in a child undergoing interpositional arthroplasty intraorally for unilateral TMJ ankylosis.<sup>5</sup>

Although authors considered the extra oral approach condylectomy followed by direct laryngoscopy technique safe and effective when FOB is not available. The risk of losing control of the airway still exist before tracheal intubation is accomplished.

## Conclusion

Adult sized fiberoptic bronchoscope may be useful in aiding nasal intubation in pediatric patients if the mouth opening permits its introduction orally.

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