

Anesthetic Management of a 14 Year Old Girl Weighing Only 20 Kg with Bilateral Temporomandibular Joint Ankylosis with Profound Micrognathia

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Abstract: Congenital Temporomandibular Joint ankylosis is a tricky entity and usually associated with ill and improper development of the mandible. We discuss a case of a 14 year old girl with Congenital Temporomandibular joint ankylosis posted for an elective Bilateral gap orthoplasty with temporal fascia interposition with right coronoidectomy and its anaesthetic implications.

Keywords: ankylosis, difficult airway management, awake nasal intubation, temporomandibular joint

1. Introduction

The Temporomandibular Joint (TMJ) is a synovial joint that is formed between the mandibular condyle and the articular fossa of the temporal bone, helping in mastication and speech. TMJ Ankylosis is defined as the loss of joint movement which results from the fusion of the bones which are within the joint or from the calcification of the ligaments around it.

The bony fusion is a painful condition which limits the jaw movement. The possible causes are congenital, infection, trauma, degenerative joint disease and prior TMJ surgeries. Rare causes include sickle cell anemia, rheumatoid arthritis and fibrodysplasia ossificans progressiva. In India, submucous fibrosis due to Paan/Gutka chewing also leads to TMJ ankylosis like situations.

Gap and Interposition Arthroplasty is one of the commonly practised surgeries for this condition. Anaesthetic management is demanding because of the difficult airway. It could be a difficult airway for ventilation in addition to intubation. Fibre-optic intubation is considered as a gold standard in a difficult airway but may not be always feasible in small and Pediatric airways. Here, we are presenting the case report of a 14 year girl with bilateral TMJ ankylosis, which included Preop psychological counselling, preop preparation of the airway and the time trusted technique of awake blind nasal intubation under regional block.

2. Case Report

A 14 year old girl thin built and malnourished weighing only 20 kgs presented with 0 mouth opening and heavy snoring during sleep and was planned for elective Bilateral gap orthoplasty with temporal fascia interposition along with right coronoidectomy.



Figure 1: Bilateral TMJ ankylosis and limited mouth opening

3. History and Examination

3.1 Preoperative Evaluation



Figure 2: Preoperative Orthopantomogram of Temporomandibular Joint

The child had history of heavy snoring during sleep, History of frequent upper respiratory tract infection was present. No history of dyspnea, paroxysmal nocturnal dyspnea, orthopnea, dysphagia, child not attained menarche even at 14 years.

On Examination- Thin built child, 0 mouth opening both nostrils patent (right more patent than left).

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CT scan shows B/l tmj ankylosis, elongated right coronoid process, Irregular uneven teeth and Left sided occluded teeth.

Table 1: Preoperative laboratory values

Parameters	Laboratory Values
Hemoglobin	11.9g/dl
Total Leucocyte count	8.2*10 ⁹ /L
Blood sugar	82mg/dl
Blood Urea	24mg/dl
Serum Creatinine	0.9mg/dl
SGOT	24
SGPT	20
Alkaline Phosphatase	140
Sodium	138mmol/L
Potassium	4.4mmol/L
Chloride	98mmol/L

3.2 Preoperative Preparation

Chlorhexidine mouth washes 4 times a day (To reduce Halitosis)

Otrinoz nasal drops (xylometazoline + sorbitol) every 6 hrly 2 drops in both nostrils .Both the above measures instituted 1 week prior to the surgery. Child treated with injectable ceftriaxone 500mg bd 24 hrs prior to surgery.

On the day of surgery, Injection Pantoprazole 20 mg iv, Inj Ondansetron 4 mg iv, Inj Glycopyrrolate 0.1 mg iv and Topical analgesia of both the nostrils with gauze soaked in 2% lignocaine in 1:20000 Adrenaline is given.

Each nostrils packed for 15 mins alternatively, half an hour prior to induction and intubation.

Bilateral superior laryngeal nerve block with 2ml of 1% lignocaine on each side, right nostril selected , 2 % lignocaine jelly smeared onto a 5.5 uncuffed red rubber tube moulded like a 'U'.

2ml of lignocaine jelly injected through the right nostril with a 2 ml syringe to anaesthetize and lubricate the right nasal package. 5 ml of 2 % lignocaine viscous is given to the child for oral rinse, child asked to keep the rinse at the back of the throat for 3 minutes and asked to spit the residual viscous after 3 minutes (A measure to minimise gag reflex during process of intubation).

3.3 Intubation

- 1) 5.5 ID uncuffed red rubber tube passed through the right nostril with the bevel facing 10 o clock position in the clock, advanced through the nose slowly and gradually hearing the breath sounds and passed into the trachea in the first attempt.
- 2) The passage of the tube is confirmed by the assistant under the thyroid and cricoid cartilage by palpation during the process of intubation.
- 3) The uncuffed tube fixed at 24cm mark at the nose and fixed. Child induced with propofol 30 mg + midazolam 4mg+ fentanyl 20 micro gram and taken deep under spontaneous respiration(partially assisted respiration) with sevoflurane in Jacksonrees modification of Ayre's T piece

- 4) A pediatric tube exchanger passed through the 5.5 uncuffed red rubber tube upto carina and red rubber tube removed.
- 5) Size 5.5 cuffed armoured tube threaded over the bougie and anchored to the nose by adhesive tapes and sutures.



Figure 3: Child with Armoured tube in situ

3.4 Maintenance

Oxygen + Nitrous oxide + Sevoflurane (0.5 – 1 %) + Inj.Atracurium and Fentanyl 20 microgram repeated every hour. Duration of surgery – 6 hrs.

3.5 Post operative period



Figure 4: Increased mouth opening post operatively

Surgery was uneventful and recovery and return of consciousness was delayed for 3 hrs after surgery. Patient ventilated in the Operation theatre and reversed when she became conscious and regained respiratory efforts.

Neuro muscular monitoring was not used during procedure due to non availability. Child reversed with 0.3 mg glycopyrrolate and 1.5mg neostigmine, Extubated over the bougie. Bougie retained for next 2 hrs in the post operative ICU. Bougie brought out through a hole cut in the poly mask and Oxygen 5L/min was given for next 6 hrs. Rest of post operative course was uneventful.

4. Discussion

Congenital TMJ ankylosis is a tricky entity and usually associated with inadequate development of the mandible. The patients are usually malnourished and suffer frequently from various metabolic complications. The common problem is halitosis due to poor oral hygiene and frequent Upper respiratory infections due to reduced immunity. This can lead

to engorged and hyperemic turbinates and nasal pathways and if not attended to in the preoperative period, can lead to fatal epistaxis during fibrotic /video/awake nasal intubation and the child can drown in her own blood and die due to aspiration during induction and intubation. Hence, there is a need to preoperatively treat the infections aggressively and decongest the nose as much as possible to prevent or minimize epistaxis during nasal intubation.

The other issues are the risk of aspiration during induction and intubation. For this purpose, a H2 receptor antagonist / proton pump inhibitor and an antiemetic are needed as premedicants well before induction.

As far as possible, the preoperative anaemia and hypoproteinemia should be corrected and hemoglobin should be above 10g/dl and serum albumin above 3gm% to ensure proper wound healing after surgery. Anchoring of the tube is a must and any accidental extubations must be avoided during the operative procedure as they are catastrophic in a paralyzed and anesthetized patient. It is always safe to ensure a thorough neuromuscular recovery and a safe practice is to extubate the patient over a tube exchanger (bougie), since laryngoscopy may not be ideal and feasible even after a successful surgery due to the abnormal positions of larynx and epiglottis. Narcotics should not be used in the post op period, as they can lead to drowsiness and airway obstructions in a difficult airway like TMJ ankylosis. Patients are at risk of nausea and vomiting and aspiration due to the influence of narcotics.

NSAIDS (Ketorolac, Diclofenac, Piroxicam and Lornoxicam) have a role in the post op period and are useful in reducing post op edema, pain and inflammation without the risk of suppressing or aggravating the protective reflexes.

Dexamethasone is also useful in the post op period for reducing the edema of the operative area and of the larynx and tracheobronchial tree and also contributes to reduction of nausea and vomiting in the post operative period and should be at least considered for use for 48 hrs after surgery. It is always a safe practice to combine dexamethasone with a H2 receptor blocker/PPI and antiemetic for at least 48 hrs after surgery or commencement of oral diet, whichever is earlier. Antibiotics and decongestant nasal drops and anti histaminics should be a part of post op treatment and should be used for 15-30 days after surgery to ensure and reduce mucosal congestion of the nasal pathway and upper airway and also minimise risk of edema and infection in the post operative period.

Mouth washes should also be continued for at least 3 months after surgery to prevent oral sepsis and halitosis and also ensure thorough oral hygiene.

Physiotherapy to open the mouth with elastics and manual retractors should be taught to the patient and parents. It may not be a bad idea to institute a chewing gum on a daily basis to mobilize the oral cavity and facilitate proper functioning of muscles of mastication and Temporomandibular joint. Ear infections also should be prevented and hygiene of the external ear also should be ensured.

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