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Anaesthetic Management of Unilateral Temporomandibular Joint Ankylosis with Partial Mouth Opening

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ABSTRACT:
Background: Temporomandibular joint (TMJ) ankylosis isa condition associated with limited to zero mouth opening. In addition to facial asymmetry, malocclusion, anaemia and malnutrition, airway obstruction may be present. All these changes make, not only intubation, but ventilation also difficult. Aim: the aim our study was the anaesthetic management of unilateral temporomandibular joint ankylosis with partial mouth opening.

Method: In this article we want to report anaesthetic management of 20 patients having unilateral TMJ ankylosis with partial mouth opening. In all patients' mouth opening was from 8mm to 10mm.

Observation: In 80% patients we could intubate by oral intubation technique while remaining 20% patients were intubated by other means.

Conclusion: Patients with partial mouth opening could be intubated orally in maximum cases, After Induction: with inj:Propofol 2mg/kg and inj: succinylcholine 2 mg/kg, we could manage oral intubation successfully.

Keywords: TMJ ankylosis, blind nasal intubation, fiber optic intubation, retrograde intubation, tracheotomy,oral intubation in unilateral TMJ with partial mouth opening.

INTRODUCTION

Temporomandibular joint (TMJ) ankylosis results in inability to open mouth either partial or complete. In India incidence of TMJ ankylosis is still high. It is observed from 2 years of age to 60 years of age [1]. Congenital TMJ ankylosis is very rare. Trauma or infection is the cause of TMJ ankylosis. Facial asymmetry, malocclusion, anemia, malnutrition may are the consequences. It also leads to increased airway obstruction, obstructive sleep apnea and corpulmonale [2]. Airway obstruction is secondary to structural encroachment on or pharyngeal and hypo pharyngeal lumen,

subatmosphericintrapharyngeal pressure and hypotonocity of oropharyngeal muscles [3]. All these structural deformities lead to difficulty in ventilation, intubation &extubation. Treatment is always surgical. Condylectomy, gap arthoplasty, interposition arthoplasty& artificial replacement of joint are the different procedures performed. If mouth opening is nil or limited, nasotracheal intubation guided by fiber optic bronchoscope,blind nasal, retrograde intubation or tracheostomy are the safer techniques of securing airway. Awake, Fiber optic scope guided nasotracheal intubation is the safest technique of intubation. As TMJ ankylosisis common in pediatric age group awake intubation is difficult to perform in these patients. Here we present 20cases of TMJ ankylosis unilateral with partial mouth opening posted for condylectomy and gap arthoplasty under general anaesthesia in last 2years and 4 months. In developing countries like India still we do not have modern gadgets like paediatric fibreopticlaryngoscopes. The purpose of this article is to stress on that there are high possibilities of intubating patients orally with unilateral TMJ ankylosis and partial mouth opening from 8 to 10mm,Anaesthetic Management Of Temporomandibular Joint Ankylosis Without Fibrotic Bronchoscope, tracheotomy,retrograde intubations difficult airway particularly in patients having restricted mouth opening in absence of modern gadgets of intubation.

MATERIAL &METHOD

Detail preoperative evaluation & investigations were done. Anaemia was treated with oral iron therapy. In patients having obstructive breathing, nasal obstruction was ruled out by detail local examination., X-ray paranasal sinus, X- ray neck anteroposterior and lateral view taken to rule out shift of larynx, trachea. Consent for surgery, anaesthesia, blood transfusion, cricothyroidotomy and tracheostomy was obtained. After establishment of IV line. Patients were given Glycopyrrolate 0.05mg/kg, Midazolam 0.o2mg/. Patients were pre oxygenated with 100 % O2 for 5 minutes. Induction was done with propofol andsuccinylcholine then macintoshlaryngoscope was introduced to the oral cavity,mouth opening was found to be increased in patients with partial mouth opening and unilateral TMJ ankylosis with muscle relaxant like SCH ,then gum elastic bougie was introduced and negotiated to the trachea and flexomettalic cuffed tube was rail loaded on the bougie,tube was connected to Bains circuit and ventilation continued on Bains circuit.ETCO2 and by auscultation air entry was checked and confirmed, O2 saturation was noted on pulse oxymeter. Once confirmed patient was given Inj. Vecuronium 0.08mg./kg IV. with Nitrous oxide, Oxygen ,halothane. Once mouth was opened more than 25mm, the oral cavity was packed with gauge to avoid trickling of saliva or blood along with tube. IV fluids & blood transfusion were given as per blood loss. At the end of surgery patients were reversed with Neostigmine (0.06 mg/kg.) and Glycopyrolate (0.05mg/kg.). Decision of extubation was taken depending upon the consciousness of patient and adequacy of respiration.

Conflict of interest: Nil
Funding: Nil

RESULTS:

Among all 20patients of unilateral TMJ ankylosis with partial mouth opening all were below the age of 14 years and youngest one is of 6 years of age and oldest one is of 13 years. Patients who had recent history of ankylosis unilateral with partial mouth opening could be intubated orally with Propofol as inducing agent and depolarising muscle relaxant like succinylcholine

Table: 1.AGE DISTRIBUTION

Age	No of patients	% age of patient
<than 12yrs	16	80%
>than 12yrs	4	20%

Table: 2. SEX DISTRIBUTION

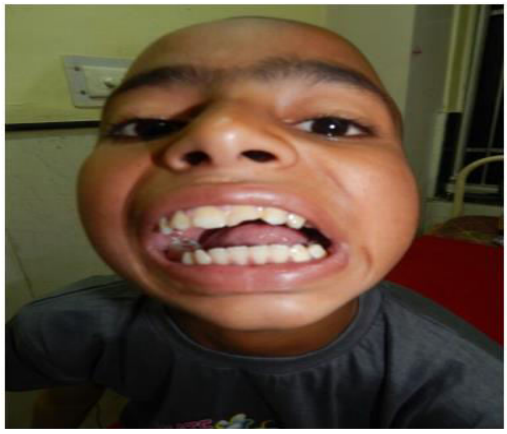
Sex	No of patients	%age of patients
Male	12	60%
Female	8	40%

Table: 3. Method of intubation

Method	No of patients	%age of patients
Oral intubation	16	80%
Intubation by other means	4	20%

Table: 4. Other intubation means

Other intubation means	No. of patients	% age of patients
Blind Nasal	4	20%
Tracheastomy	0	0%
Fibreoptic intubation	0	0%




Preop mouth opening; Fig 1 and 2


Intra op pt 2: Fig 3. Post op pt 2: Fig 4.

DISCUSSION

Temporomandibular joint ankylosis results in restricted or nil mouth opening & jaw function gets affected. It may be unilateral or bilateral. Facial asymmetry, deviation of mandible & chin on affected side, hypoplastic mandible with receding chin & fullness of face on affected side are the features of unilateral TMJ ankylosis [1]. In bilateral TMJ ankylosis facial symmetry is maintained but micrognathia is present. Birdface deformity, receding chin, narrow maxilla, protruding upper incisors with nil or few mms mouth opening are the features of bilateral TMJ ankylosis. Untreated

cases may lead to malnutrition, facial asymmetry, and respiratory distress, and poor oral hygiene, carious or impacted teeth. Increased airway resistance &corpulmonale may occur [2]. Structural encroachment of oropharyngeal lumen, subatmosphericintrapharyngeal pressure, hypo tonicity of oropharyngeal muscles resulted in airway obstruction. If occurred during growth of child it results in narrow oropharyngeal airway secondary to shortening of mandibular rami and narrowing of space between the mandibular angle [3].All these structural abnormalities with restricted or no mouth opening results in difficulty in securing airway. Awake fibre optic guided intubation is the safest approach of intubation. Nasal intubation either blind or fibre-optic guided & awake or under anaesthesia, retrograde intubation & tracheostomy are the different techniques of securing airway in these patients. If anaesthetic agents are used there is risk of peri-operative apnea, desaturation &dysarhythmia [3]. Due to extreme sensitivity to central depressant drugs benzodiazepines and opioids should be used in titrated dose only [3]. Retrograde intubation needs patient's cooperation which is difficult to obtain in children. Tracheotomy is indicated in those patients in whom significant postoperative airway compromise is anticipated. Considering severe morbidity, long term side effects & mortality it should be the last option, only in case of emergency [3].Use of Gum Elastic boogie to facilitate blind nasal intubation has been suggested. Awake intubation needs patients co-operation, local blocks for nerves of larynx and topical anaesthesia for upper airway. There is a chance of severe laryngospasm or inability to pass endotracheal tube. So use of Halothane, Nitrous oxide & Oxygen along with topical anaesthesia& light sedation. Topical anaesthesia can be achieved by Cocaine, Lignocain 3% with 0.25% Phenylephrine, and Lignocain with adrenaline [4]. This will provide topical anaesthesia& vasoconstriction which prevents bleeding & widen the nasal passage [5,6]. Nebulization with 10% Lignocaine also provides topical anaesthesia. But it is time consuming, high concentration of Lignocaine is required & may need supplenmentation[6]. Anticholinergic agents reduce secretions, increase intensity &speed of onset &duration of topical anaesthesia [7].Use of Sevoflurane and Propofol for induction of anaesthesia is also safe. Induction with Ether& Halothane has been attempted [8]. It provides muscle relaxation, bronchodilatation and good intubating condition. Before intubation nasal patency should be tested. If both nostrils are patent Right nostril is chosen as the bevel of tube will face the flat nasal septum & helps in reducing damage to inferior turbinate [9].

For blind nasal intubation patient was placed in sniffing position. Lubricated endotracheal tube was introduced through nose in a plane perpendicular to face. Tube was inserted until maximum breath sounds were heard. Tube was connected to Bain's circuit &Ventilation continued with N2O + O2& halothane. Another nostril was obliterated with operator's finger. Once complete muscle relaxation was achieved infant feeding tube was passed through nasal tube & 4% Lignocaine sprayed through it. Patient's spontaneous respiration helps to spread the local anaesthetic solution over glottis & then tube was advanced. If tube did not enter in glottis manipulation of tube was necessary for correct placement of the endotracheal tube. If tube had entered in esophagus tube was withdrawn & neck extension was done. If tube was impinged anteriorly slight neck flexion was done. If tube was felt beside larynx turning the tube tip away from that side might help for successful intubation. Successful intubation was confirmed by auscultation of breath sounds , pulse , ETCO2& observation of bag movements. After confirmation injection Vecuronium was given along with N2O + O2& Halothane. Nasal intubation is contra-indicated in coagulopathy, severe intranasal disorder, basilar skull fracture and C.S.F. leak. Nasal intubation may lead to septicemia, perforation of nasal septum, injury to inferior turbinate. Transnasalfiberoptic guided intubation under sedation or under the influence of inhalational anaesthetics with patient on spontaneous respiration is the safest approach of intubation [10]. But unavailability of fiber optic bronchoscope is the limiting factor. Retrograde intubation is difficult to perform if mouth opening is less than 5mm.In children modified technique of retrograde intubation under general anaesthesia has been described[10]. So blind nasal intubation under effect of halothane, Nitrous oxide and Oxygen with spontaneously breathing patient is the other option for intubating these patients [11].In unilateral TMJ ankylosis Patients after

preoxygenated with 100 % O2 for 5 mints, Induction , done with inj. propofol and inj. succinylcholine then macintoshlagyngoscope was introduced to the oral cavity, we found mouth opening increased slightly in patients unilateral TMJ ankylosis with muscle relaxant like SCH ,then gum elastic bougie was introduced and negiotiated to the trachea and flexomettalic cuffed tube was rail roaded on the bougie ,tube then connected to Bains circuit . Once venilation confirmed patient was given Inj. Vecuronium 0.08mg./kg, with Nitrous oxide, Oxygen ,Halothane. Tracheostomy should be the last option only in emergency when all other approaches failed. Tracheostomy has its own advantages & disadvantages. Surgical airway should be kept reserved for failed intubation .In emergency situation cricothyroidotomy provides effective ventilation.

CONCLUSION

We concluded that patients withunilateral TMJ ankylosis with mouth opening 8 to 10mm, can be managed without any morbidity & mortality by oral intubation technique after preoxygenation and muscle relaxant like succinylcholine use without any modern gadget successfully. In 80% patients we could intubate by oral intubation technique and 20% patients required other techniques of intubation. This intubation technique is helpful in managing, cases of restricted mouth opening and is without morbidity and easy to learn.

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