Experience with Blind Nasotracheal Intubation for Temporomandibular Joint Ankylosis at Mayo Hospital, Lahore

K JAVED A AMJAD M A AZIZ
Department pf Anaesthesia, King Edward Medical College/Mayo Hospital, Lahore
Correspondence to Dr. Khalid Javed, Associate Professor

Temporomandibular joint ankylosis presents a serious problem for airway management. Alternate or additional technique of airway control are required in this condition. Different options include blind nasotracheal intubation, fiberoptic intubation, retrograde intubation or tracheostomy. Moreover, the patient could be awake or asleep. The purpose of our study was to describe our experience with blind nasotracheal intubation after induction of general anaesthesia with spontaneous ventilation in patients of temporomandibular ankylosis presenting for corrective surgery. This experience was gained on all the patients of temporomandibular joint ankylosis presenting to fasciomaxillary department at Mayo Hospital, Lahore over a period of 1 ½ years. The surgery done was gap arthroplasty with genioplasty. Thirty six patients (male:24, female:12) with age ranging between 3 years to 25 years with a mean of 12.56 years were studied. All the patients received premedication with atropine 10mg/kg body weight to dry up secretion. Patients were deeply anaesthetized with Halothane, Nitrous oxide with 50% oxygen. Thirty four patients were successfully intubated. Blind nasal intubation failed in 2 patients. The successful blind nasotracheal intubation for surgery for TMJ ankylosis needs adequately and deeply anaesthetized patients, relatively small well lubricated endotracheal tube passed through patent naris with atropine as premedication.
Keywords: Temporomandibular joint ankylosis, blind nasotracheal intubation, manoeuvre

Temporomandibular joint (TMJ) ankylosis results from trauma, infection and inadequate surgical treatment of the condylar area. Condylar damage during childhood can produce ankylosis and alteration of the mandibular growth. In case of unilateral ankylosis, occurring in early childhood, a mandibular hypoplaisia of the affected side may develop. The patients have limitation of mouth opening, facial asymmetry, and chin deviation toward the affected side. The treatment of mandibular hypoplasia with unilateral ankylosis in the childhood consists of osseous mandibular distraction to correct facial assymetery together with arthroplasty to treat the ankylosis, both accomplished in the same surgical procedure[1].

Besides trauma, the other major cause of antylosis of temporomandibular joint is infection. Infection related aetiological factors are likely to give rise to extracapsular ankylosis while trauma results in intraocapsular ankylosis[2]. Many techniques for treatment have been described. Wide bone resection, the use of interpositional spaces, insensitive and aggressive physiotherapy immediately after the operation are the basic principles as agreed by many authors[3].

The aetiological factors and duration of ankylosis influence the type of ankylosis whether fibrous or bony. The oral opening may decrease to 10mm or even less. Temporomandibular joint ankylosis thus presents a serious problem for airway management. This relatively rare problem becomes even more difficult to manage in children because of their smaller mouth opening with near total trismus[4].

The special anaesthetic considerations in such a child as regards difficulty in intubation, are the need of general anaesthesia before making any attempt to secure the airway, the high sensitivity to all central depressant drugs, awake extubation and postoperative maintenance of clear airway. The different options for securing airway in patients of TMJ ankylosis undergoing surgery include:

1. Blind nasotracheal intubation.
2. Fiberoptic laryngoscopic intubation.
3. Retrograde intubation.
4. Tracheostomy

Blunt nasal intubation remains an important technique in the management of the difficult airway. It can be done with local blocks for nerves of larynx and topical anaesthesia for upper airway or after induction of general anaesthesia.

The purpose of our study was to describe our experience with blind nasal intubation after induction of general anaesthesia with spontaneous respiration in patients with TMJ ankylosis undergoing corrective surgery at Mayo Hospital, Lahore.

Materials and methods

This experience was gained prospectively on all 36 patients both male and female between the age of 3 years to 25 years, coming for surgery for TMJ ankylosis (unable to open the mouth) in Maxillofacial department of Mayo Hospital, Lahore over 1½ years.

Preoperative assessment was done a day before surgery. On the day of surgery i/v cannula was inserted on the non-dominant hand and I/V line maintained with Hartmans solution 500ml. SPO_2, ECG and NIBP were monitored throughout the operation. Atropine 10µg/kg body weight was the only premedication given to dry up the secretion. Phenylephrine nasal spray was done to both naris before induction of anaesthesia. Inhalational induction was done with Halothane and N_2O and O in

50%. Halothane was increased gradually till the patient was deeply anaesthetized and adequately relaxed. This was judged by power of upper limbs and by movement of lower jaw. Then relatively small disposable ETT (0.5mm smaller than required) well lubricated with 2% lignocaine jelly was inserted through the naris which was more patent, at right angle to the face of patient and parallel to the floor of nose. By gentle movement, the tube was advanced from nose to nasopharynx. From here, the tube was now advanced slowly and gently into the trachea through glottis by listening to the breath sound loudness at proximal end of ETT. As the ETT approaches the glottis, the breath sound loudness increases, the patient will cough and may hold breath when ETT passes the glottis into the trachea. But if the ETT passed without any resistance and breath sounds diminished also, it means that the tube was in esophagus so that it was pulled back to the point of maximum breath sounds. Then the head was extended, at the same time larynx was pushed backwards and the ETT was then moved into trachea through glottis.

If the ETT moved into pyriform fossa, then a bulge was seen on the side of larynx and resistance was felt. In this situation again, the ETT was pulled back to the point of maximum breath sounds and larynx was pushed to the side of bulge, to enable the tube pass into the trachea. Some time the tube tip was felt anteriorly above the laryngeal prominence. It meant that ETT tip was in the anterior commissure and ETT was pulled back to the point of maximum breath sounds. The head was then flexed, and ETT was passed into trachea.

Once the ETT was in the trachea, its placement was confirmed by movement of the reservoir bag, moisture condensation in ETT on expiration and auscultation of chest. The ETT was fixed firmly to prevent its movement.

Anaesthesia was maintained with spontaneous ventilation with Halothane, N_2O and O_2 till the completion of surgery. The patients mouth aperture was now increased. Throat suction was done. N_2O and halothane were turned off and 100% O_2 given and then the patient was extubated when fully awake. Also no narcotics for post operative analgesia; only NSAIDS were given for post operative analgesia.

Results

Thirty six patients, 24 male and 12 female with age ranging between 3 to 25 years with mean age of 12.5 years were included in the study. In 34(94.44%) patients the blind nasotracheal intubation was accomplished successfully without any complications. In 2(5.55%) patients blind nasotracheal intubation failed. Intubation time was variable ranging between 15 minutes to 40 min mean 26 minutes. No laryngeal or bronchospasm occurred in any patient.

Discussion

Fasciomaxillary surgery is the surgery of 3Ts tumour, trauma and temporomandibular joint ankylosis. Out of these, temporomandibular joint ankylosis poses greatest problems for the anaesthesiologist. If mouth aperture is equal or less than 20mm, blind nasotracheal intubation or fiberoptic intubation or retrograde technique for intubation are indicated[6]. In case of failure of intubation of hypoxic patient, the anterior percutaneous route should always be kept in mind and transtracheal ventilation should be ready in case of failure or even tracheostomy.

Blind nasal intubation remains an important technique in the management of the difficult airway. Main problem in the patients of TMJ ankylosis is the successful blind nasotracheal intubation and its confirmation.

Many aids to this technique have been described, but unfortunately, these often require additional expense, training and equipment. Methods that involve listening at the end of endotracheal tube and observing moisture condensation in the tube are relatively insensitive and may expose the operator to the patients body fluids. In a study to devise an effective, inexpensive and simple aid to nasal intubation, Harris RD and his colleagues described the use of an endotracheal tube stethoscope in conjunction with either 'inline' or 'sidestream' capnometry[7].

The sonomatic confirmation of tracheal intubation (SCOTI) is a new device used to confirm the placement of tracheal tubes. In their study Trikha A and his colleagues compared the predictive valve of SCOTI with that of clinical auscultatory method and a capnograph to confirm 132 blind nasal intubation. They found that this device is not very useful for confirming the correct placement of tracheal tubes after blind nasal intubation[8]. In our study we confirmed the correct placement of nasotracheal tube by auscultation of chest, reservoir bag movement and condensation of moisture in ETT on expiration.

In another study by Sugiura N and his colleagues, success rate of blind nasotracheal intubation was improved by using nasogastric tubes as a guide during intubation, first for passing ETT through nasal cavity and second, passing it from pharynx to the larynx. By adding both sedation by modified neurolept analgesia (NLA), topic and transtracheal administration of lidocaine, the technique became safer and smoother. The rush spiral tube was thought to be most suited for blind nasal intubation[9].

If the tube does not easily enter the trachea, several manoeuvres may enhance the success[10]. We used these manoeuvres like extension, flexion and lateral rotation of head and neck as and when required during intubation. We were successful in 34/36 patients.

Slight inflation of ETT cuff to facilitate blind nasal intubation as described by Goberet in 1987 has been shown to be effective for increasing the rate of successful

intubation from 45-95% in patients without airway alterations. In our study, the usefulness of the technique was assessed in patients with anatomical alterations of airway in whom difficult intubation was predicted. They concluded that inflation of ETT cuff is useful for facilitating nasotracheal intubation in awake patient[11].

Blind nasal intubation often results in esophageal placement of the tube because reflex swallowing and supralaryngeal structures direct the tube posteriorly. Extrusion of the tongue which inhibits swallowing and shifts the supralaryngeal structures anteriorly, facilitated blind nasal intubation[12].

All these manoeuvres require no specialized training or equipment. Concern over complications of using this route of intubation and lack of training may be limiting its use. A thorough knowledge of anatomy, benefits of using nasal vasoconstrictor and the attention to the technique are pre-requisite to maintaining the skill. The knowledge, technique, gentleness and patience are the basic ingredients for the perfect recipe of blind nasal intubation.

In recent years, fiberoptic nasotracheal intubation is in. This technique is efficient but delicate, and needs a skilled qualified operator. But it may avoid the inconvenience of tracheostomy in very difficult cases.

The retrograde intubation technique is an important option for gaining airway access from below the vocal cords when blind nasal intubation fails or fiberoptic bronchoscope is not available.

Blind nasotracheal tube can be passed in awake patient using local blocks of laryngeal nerves and topical anaesthesia of upper airway or after induction of general anaesthesia. We attempted blind nasal intubation after induction of general anaesthesia with halothane O2+N2O. We were successful in 34/36 patients 94.44% with a mean time of 26 minutes.

Conclusion

It was concluded from this study that successful technique for blind nasal intubation for TMJ ankylosis requires:

1. Administration of antisialogogue agent to minimize oral secretions.
2. Deeply anaesthetized patients with halothane with spontaneous respiration.
3. Well lubricated, relatively small endotracheal tube should be introduced through more patent naris without any undue application of any force.

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