RETROGRADE INTUBATION IN TEMPOROMANDIBULAR JOINT ANKYLOSIS

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Abstract: Intubating a patient with temporomandibular joint ankylosis is always a challenge particularly when fiberoptic bronchoscope is not available. The airway can be secured by using wide number of available techniques which include blind nasal intubation, retrograde intubation using a guide wire, intubating with the help of fiberoptic bronchoscope and tracheostomy. Here, we present a case report of retrograde intubation in thirty five year old female with TMJ ankylosis posted for interpositional gap arthroplasty.

Keyword: Retrograde Intubation, Temporomandibular joint ankylosis, Guide wire, Difficult airway.

Introduction: Successful intubation can be accomplished in a majority of patients using direct laryngoscopy. But alternative or additional techniques of airway control are required whenever the airway is deemed difficult because of anatomical or technical causes. The retrograde intubation technique serves as one important option for scenarios gaining airway access in such scenarios. Ankylosis is a Greek terminology meaning 'stiff joint'. TMJ ankylosis is the immobility or fusion of the temporomandibular joint. This causes inability to open the mouth making conventional laryngoscopy and intubation methods difficult. For conventional laryngoscopy to be performed mouth opening of 2.5 cm is required. Case Report: A well informed, cooperative female patient, 25 years old belonging to ASA PS class II was admitted to the hospital for interpositional gap arthroplasty of left TMJ ankylosis. Her chief complaint was inability to open the mouth since 4 years of age. She had a history of fall in her childhood and traumatised her left TMJ. Gradually she developed restriction of mouth opening and resulted finally in inability to open the mouth. She was diagnosed to have bony ankylosis of left TMJ and was fixed with distraction device three months back. Now she was posted for removal of distraction device followed by interpositional gap arthroplasty under general anaesthesia. She had no co-morbid illness and her previous surgery was done under general anaesthesia.
using retrograde intubation. There was no history of hoarseness of voice, breathlessness or difficulty in swallowing. Preoperative evaluation revealed haemoglobin of 11.2gm%, haematocrit of 33%, Blood sugar-116 mg/dL, Blood urea- 26 mg/dL, Serum creatinine- 0.9 mg/dL, serum Sodium- 138 mEq/L, Serum Potassium-3.2 mEq/L. Chest X-Ray PA view revealed trachea in midline, normal lung fields. Height-155 cm; weight- 55 kg; CVS- S1S2 heard; RS- NVBS heard.

Her airway examination revealed no mouth opening with a minimal gap between the overriding incisors, projecting upper incisors, missing right upper incisors and retrognathia (Fig.1 & 2). Stemomental distance was 11 cm, thyromental distance 7 cm, upper lip bite test class III. Neck mobility was normal. Both nares were patent. Patient was taken up for elective surgery under general anaesthesia with retrograde intubation.

The procedure and the possibility of resorting to tracheostomy was explained and an informed consent was obtained from the patient. She was transferred to the operating room. Non invasive blood pressures, ECG, pulse oximeter were connected. Her pre operative heart rate, SpO2 and blood pressures were recorded. An intravenous access was established with 18 G cannula in right forearm. Inj. Glycopyrrolate 0.2 mg i.v., Inj. Ondansetron 4mg i.v. and Inj. Fenatnyl 1µg/kg i.v. given. Oxygen was administered through venti-mask till the beginning of procedure.

Preparation of the airway:1) Mucous membrane of oropharynx anaesthetised with 4% lignocaine, sprayed with needle onsyringe.2) Bilateral superior laryngeal nerve blocked with 3 ml of 1% lignocaine on each side.3) Trachea below the vocal cord was anaesthetised by translaryngeal injection of 3ml of 4% lignocaine using 24 G needle which was introduced into trachea through the criothyroid puncture.4) Both the nostrils were packed with 4% lignocaine with Xylometazoline drops. Technique: Under strict asepsis, using 18 G IV cannula criothyroid membrane was punctured with the needle directed cephalad. After confirming the intra tracheal position by aspirating air, needle removed and Jtipped guide wire was passed through the cannula(Fig.3). The guide wire was retrieved through the left nostril(Fig.4).  

Fig.1. Patient showing restricted mouth opening  
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Fig.3 Insertion of guidewire through the cannula

Fig.4 Guidewire retrieved through left nostril
Now the cannula was removed and the tracheal end of the guide wire was clamped with artery forceps to prevent accidental dislodgement. A 7.0mm cuffed ETT was passed over the guide wire through the Murphy’s eye (Fig.5). Guide wire was pulled from the tracheal side with ETT railroading over it(Fig.6). Near the glottis resistance was met and the ETT was slightly rotated laterally and pushed into trachea.

Fig.5 Introducing the ETT over the guidewire Fig.6 Railroading the ETT over the guidewire

After inflating the cuff ETT was connected to the breathing circuit and manually ventilated to confirm the position. After confirming the successful tracheal placement by auscultation of chest the guide wire was removed from proximal end. Patient was induced with Inj.Thiopentone 5mg/kg i.v and Inj.Atracurium 0.5mg/kg i.v. Anaesthesia was maintained with sevoflurane/fentanyl/atracurium/oxygen-N2O mixture. IPPV was maintained with a tidal volume of 500ml, RR of 12/minute. After the completion of surgery patient was reversed with Inj.Neostigmine 0.04 mg/kg and Inj.glycopyrrolate 0.4 mg. Her mouth opening was 1cm. In view of nature of the surgery and difficult airway patient was not extubated and was maintained on oxygen through T-piece for 24 hours in PACU. Patient was extubated in PACU after 24 hours and observed. Patient was comfortable, had no respiratory distress, maintained SpO2 of 100% in room air.

Discussion: In TMJ ankylosis with complete inability to open the mouth, intubation can be achieved using fibreoptic bronchoscope, blind nasal techniques or by retrograde techniques. Blind nasal techniques cause a risk of increased nasal bleeding leading to increased chances of aspiration. Intubation via
fibreoptic bronchoscope requires considerable experience before it is used in difficult cases and is not available in all centers. In such circumstances, retrograde intubation serves as an effective alternative. Retrograde passage of guidewire into the pharynx to aid tracheal intubation is an established technique and has been used to secure difficult airways in both elective and emergency cases. This technique was first described by Butler and Cirillo in 1960 primarily for intubating patients with laryngeal tumours. Over the time it has gained place in all difficult airway cases. The classical technique is performed using Tuohy’s needle and epidural catheter. In our case we performed a modified technique using guide wire and IV cannula which are readily available in the operating room. The guide wire also offers the following advantages, 1) J tip tends to be less traumatic to the airway The conventional guide wire technique requires an equipment consisting of 18-gauge angiocatheter, J-tip guidewire and a guide wire catheter. The technique we performed is cost effective, readily available and is sterile. Awake intubation demands full cooperation from the patient. It requires administration of airway blocks to prevent sympathetic stimulation, laryngospasm and discomfort. In the literature many techniques are described. In our case we administered superior laryngeal nerve block, trans tracheal infiltration, topical spray of oropharynx and nasal mucosa spray. Regarding the entry site, we entered puncturing cricothyroid membrane which is relatively avascular and less potential for bleeding. The disadvantage is the angle of entry of the ETT into trachea is more acute with a potential to cause vocal cord trauma. But vocal cord trauma has not been reported in living patients. The other entry site that can be used is cricotracheal ligament which carries increased risk of bleeding. Any technique carries inherent contraindications, as do our retrograde intubation. Most of them are relative like, unfavourable anatomy (severe flexion deformity of neck, obesity, thyroid goitre), coagulopathy and infections (pretracheal abscess) Although there are some complications mentioned in the literature like bleeding from the nose or from the site of cricothyrotomy, minimal subcutaneous emphysema, infections like pretracheal abscess, airway trauma we have not encountered any such complications in our case. This technique is easy to learn, requires little equipment and is a rapid, safe and effective method for intubating the trachea in difficult airways.

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