Awake-Retrograde Naso-Tracheal Intubation in Temporo-Mandibular Joint Ankylosis

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ABSTRACT

Direct laryngoscopy and tracheal intubation remains the technique of choice to control the airway in normal situation. However, situations frequently arise in which simple orotracheal intubation is impossible. Intubating a patient with temporo-mandibular ankylosis with very limited mouth opening is always a challenge for anesthetist particularly when fibro-optic laryngoscope is not available. In this situation awake retrograde naso-tracheal intubation may be very useful. Here we report two cases of temporo-mandibular ankylosis with successful naso-tracheal intubation.

KEY WORDS: Retrograde intubation, Temporo-mandibular joint, Ankylosis

INTRODUCTION

A number of techniques are available to deal with difficult intubation. It may be either blind nasal intubation, use of fibro-optic laryngoscope, tracheostomy or retrograde intubation through cricothyroid puncture. (1) This technique of intubation has been applied successfully to secure difficult airways in elective and emergency situations. (2) Retrograde intubation was first described in 1960. (3) Since then several modifications have been reported. Some has used epidural catheter as a guide wire through cricothyroid puncture and then retrieval of the catheter from the pharyngeal cavity using suction catheter. (6) Others have used double guide-wire technique, one through cricothyroid membrane and another through subcricoid puncture for retrograde intubation (4) Here we have used j tipped guide wire from CVP Catheter (B Braun, 7.5G). Since its j end is quite soft, it easily negotiates through curved pathway of the larynx, pharynx and nasopharynx without causing any harm to the tissue.

CASE HISTORY:

CASE 1:
A 21 year female (wt 45kg, ASA I) was admitted to the hospital for bilateral condylectomy. She gave a history of injury on the lower chin while riding on bicycle 5 yrs back. Since then she is not able to open her mouth. Three years back she was admitted at patan hospital. Since there was no mouth opening, tracheostomy was done to carry out right condylectomy. But the condition did not improve.

On examination, the airway revealed no mouth opening with minimal gap between incisors, no TM joint movement. There was no retrognathia and the mentothyroid distance was 6 cm and mentohyoid distance 3 cm. Both nostrils were patent, neck mobility was normal, and cricothyroid membrane was easily indentifiable. There was no history of hoarseness of voice, difficulty in swallowing, and no other co-morbidity. Investigations were within normal limits.

CASE 2:
A 21 yr male ASA I, 45 kg presented with the complain of inability to open the mouth. He gave a history of fall from height resulting in injury to the chin about 7 yrs ago. Since then he is unable to open his mouth. He is able to take liquids and some solid food. On examination his mouth opening is about 1 cm. There is slight retrognathia, thyromental distance is 4 cm and thyrohyoid distance is 2.5 cm. No history of snoring, hoarseness of voice, difficulty in swallowing. Both nostrils are patent, neck mobility is normal. X-ray shows left TMJ ankylosis. Gap arthroplasty of the ankylosed joint under GA was planned.
METHOD

In view of minimal mouth opening, posttracheostomy status and non-availability of fibro-optic bronchoscope, tracheal intubation with retrograde technique was planned in a conscious patient following bilateral superior laryngeal nerve block and topical anesthesia of the airway.

An informed consent was obtained from the patient. Proper counseling was done. Since patients cooperation is very important for the procedure to be successful, every step was explained in detail and also informed about the discomfort she/he might experience during the procedure. Possible failure of the technique requiring tracheostomy was also explained and consent for tracheostomy obtained. Preoperatively, the patients were prepared with aspiration prophylaxis with metoclopramide 5mg and ranitidine 150mg on the night before and on the morning of surgery.

Nasal decongestants (xylometazoline 2%) instilled in both nose 3-4 times since one hour before surgery. IM atropine was also given 45 min before surgery for its antialalogue effect. Intravenous cannula 18g was placed on left hand. Injection midazolam 2mg and inj pethidine 25mg was given IV. Routine monitoring was attached. After cleaning the neck with antisalptic solution, bilateral superior laryngeal nerve block was performed with 2% xylocaine 1ml on each side. Topical anesthesia of nares and nasopharynx was done with 4% xylocaine 1ml on each side. Cricothyroid membrane was punctured with 18G cannula and tracheal lumen confirmed by air aspiration 1.5ml of 4% xylocaine was instilled into the trachea during expiration to anesthetise tracheal mucosa and lower parts of larynx. Then the j-end of guide wire (CVP LINE) was threaded through the opening of cannula into the the trachea and advanced retrogradely in cephalad direction. There was slight resistance while the wire was passing through the vocal cords, then the patient felt something in the mouth. Patients were advised to push the wire with her/his tongue towards the nose. It easily came out of left nose in first patient and of right nose in second patient. The cricothyroid end of wire was clamped with arteryforcep. A 6mm polyvinyl chloride cuffed endotracheal tube well lubricated with xylocaine jelly was passed over the guide wire through its Murphys eye into the nose. There was slight resistance while negotiating the tube through the larynx, so both end of wire were pulled slightly taught and straight and the tube easily went through the larynx. Then the cricothyroid end of wire was relaxed so that tube easily slides further into the trachea.

Breathing was confirmed with the movement of reservoir bag. Auscultation was done while ventilating the patient. Patient was tolerating the tube comfortably due excellent anesthesia of the airway. When fully confirmed about the position of tube, anesthesia was induced with propofol and maintained with isoflurane. Ventilation controlled with muscle relaxant vecuronium. The remaining intra and postoperative period were uneventful. After completion of surgery, mouth opening was 4 cm. in both cases. The trachea was extubated after reversal of residual neuromuscular blockade with neostigmine and atropine and when the patient was fully awake.
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**DISCUSSION:**

Endotracheal intubation in patients with restricted mouth opening always remains a challenge. In TMJ ankylosis the technique of blind nasal intubation was traditionally recommended. It is time consuming. It can fail and repeated attempts may injure involved structures resulting in complication like bleeding and airway obstruction. TMJ ankylosis in growing children can deform airway anatomy, leading to failure of blind nasal intubation.

The fibro-optic laryngoscope is a method of choice for intubating patients with TMJ ankylosis. But it is not available in our institution. Even if you manage to get it, need lot of practice to master it and its maintenance cost is also high. Bleeding in the oropharynx can obscure the airway with a fibreoptic laryngoscope even for an experienced anesthetist.

Passing a retrograde guide wire through a cricothyroid puncture and then rail loading endotracheal tube over it to gain access of the airway is a useful technique in cases of difficult airway. It was first described in 1960. Since then several modifications have been reported. Some has used double guide wire technique. One guide wire was passed into the airway from cricothyroid puncture site and another from subcricoid site. Both were brought out through the nose. The first guide wire was used for retracting the epiglottis and the second as guide for passing the endotracheal tube. The author has reported high success in negotiating the tube into the trachea.

T.R. of J.J.M. medical college of Georgia has described retrograde intubation using the subcricoid region. He has cited several advantage of this approach, including absence of bleeding complication, reduction in possible development of subglottic oedema and stenosis. [5]

P. Bhattacharya and all has described a technique of retrieval of a retrograde catheter using suction, in patients who cannot open their mouths. They have
used epidural catheter as guide wire and its retrieval via nostril, by applying suction through a suction catheter. [6]

Since epidural catheter is quite soft, there is high chance that it will coil up in oropharynx and also negotiation through the nasopharynx is not very easy. To retrieve the catheter they have used suction which further complicates the procedure.

We have used cricothyroid membrane as the site as it is quite easy to identify. As a guide wire we used wire from CVP catheter (B.BRAUN, 7.5 G). Its j-tip is quite soft and it easily negotiates through the curved passage of larynx, pharynx, nasopharynx, nasal passage and came out of the nostril without much difficulty. However in our experience while rail loading the endotracheal tube we felt some obstruction at the epiglottis level. To overcome this you have to do some rotating movement and keep both end of guide wire taut.

Further scope for modification is there. To be successful in retrograde intubation, a good rapport with the patient is very essential. Counseling is very important. Every step should be explained in detail and patient should be warned about discomfort she/he might experience during the procedure. Enough time should be given to anesthetize the airway properly. Good airway anesthesia is a key for success during awake retrograde intubation.

REFERENCES