

## Retrograde Intubation Using Epidural Catheter- A Novel Technique

Nayna Solanki\*, Heena Parikh\*\*, Gunjan Shah\*\*\*

### Abstract :

Oral submucous fibrosis is a high risk precancerous condition characterized by changes in the connective tissue fibers leading to stiffness of mucosa and restricted mouth opening. The complete closure of mouth presented a difficult situation for securing the airway. The retrograde intubation technique is an important option for such cases. We present a case of oral submucous fibrosis with nil mouth opening for corrective surgery under general anesthesia. It is successfully managed by retrograde intubation via epidural catheter.

**Keywords :** Difficult airway, Retrograde intubation, Epidural catheter, Rail roading.

### Introduction :

In 1952, J Schwartz coined the term atrophicoidiopathica mucosa oris to describe an oral fibrosing disease. <sup>(1)</sup> He discovered in five Indian women in Kenya. S.G.JOSHI subsequently coined the term oral submucous fibrosis for this condition in 1953. <sup>(2)</sup> Oral submucous fibrosis is chronic irreversible precancerous condition characterized by juxta epithelial inflammatory reaction and progressive fibrosis of submucous tissues. As the disease progresses, jaws become rigid to the point that the sufferer is unable to open his mouth. Induction and maintenance of anesthesia in such patient is a challenge to anesthesiologist.

### Case Report :

A 36 year old man weighing 58Kg presented with complaint of nil mouth opening since two and a half years without significant illness. Patient was chronic tobacco chewer since 22 years. Patient was unable to take solid diet and was on liquid and semi-liquid diet. Patient's mouth opening was only 1 centimeter. Mullampatti grade could not be seen. Airway examination was normal, both nostrils were patent, mentohyoid and thyromental distances were normal. Patient had no complaint of dyspnea or change of voice or snoring during sleep.

We explained to patient's relatives that the technique may fail and consent for tracheostomy was taken. We planned for awake blind nasal intubation as we did not have a flexible fiber optic laryngoscope. We did the following preparations.

1. Difficult airway kit and tracheostomy tray kept ready.

2. Two drops of xylometazolin were applied in each nostril followed by throat gargling with lignocaine viscous. Lignocaine jelly applied inside nasal cavities and lignocaine infiltration given over area for cricothyroid membrane puncture.
3. Well lubricated nasopharyngeal airway number 8 inserted in right nostril of patient.
4. Monitoring with SpO<sub>2</sub>, EtCO<sub>2</sub>, ECG and NIBP was done.

Patient was positioned in full neck extension. A small pillow underneath shoulder and head ring was kept. Intravenous injection ranitidine 15mg, injection ondansetron 4mg, injection glycopyrrolate 0.2mg, injection fentanyl 100µg and injection midazolam 1mg were administered and tried for blind nasal intubation with 7.00 mm endotracheal tube. EtCO<sub>2</sub> and Bain circuit were attached for early detection of endotracheal intubation. We gave titrated dose of injection propofol as mask ventilation was possible. We failed to intubate the trachea via blind nasal route despite 2-3 attempts. Thorough oral and nasal suction was done. Cricothyroid membrane was punctured with 24 gauge needle and 2 ml of 2% lignocaine was instilled into the trachea and epidural catheter no. 19 was inserted (Photograph 1).

### Photograph 1: Retrograde intubation technique showing cricothyroid puncture



\* Assistant professor

\*\* Associate professor, Department of Anaesthesiology, GCS Medical College Hospital & Research centre, Ahmedabad, Gujarat, India

\*\*\* Assistant professor, Department of Dentistry, GCS Medical College Hospital & Research centre, Ahmedabad, Gujarat, India

Correspondence : e-mail: drnaynasolanki@gmail.com

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It was presumed that the catheter would have to be threaded via nasopharyngeal airway as it is less resistant pathway but the catheter came out from mouth. Mouth gag was inserted to open the mouth but it gets opened by 1cm only. The catheter was retrieved through the oral cavity using a Magill's forceps. Next, we introduced infant feeding tube no. 10 in to left nostril and advanced it forward in an attempt to tie up with epidural catheter. Then we pulled infant feeding tube from nose up to sufficient length till epidural catheter was retrieved from left nostril (Photograph 2).

### Photograph 2 : showing retrograde pathway of epidural catheter



We threaded endotracheal tube number 7 over the catheter and inserted beyond vocal cords. Bilateral air entry was checked and position of tube was confirmed with EtCO<sub>2</sub>. Anesthetic induction was done with intravenous propofol 80mg and vecuronium 4mg and maintained with oxygen, nitrus oxide, isoflurane and injection vecuronium. After completion of surgery, the patient's mouth could be opened to 3 cm. The trachea was extubated when the patient started obeying commands and protective reflexes were present. The epidural catheter in trachea was taken out just before extubation. Recovery was uneventful and the patient was discharged from hospital after 5 days.

### Discussion :

In developing countries, patient of oral submucous fibrosis often present late usually when mouth opening has been either become very small or absent. Intubation in such cases leaves us with three options. A. Blind nasal intubation, B. Retrograde intubation and C. Fiber optic laryngoscope. As in our case blind nasal intubation may fail. Fiber optic laryngoscope is not available at our place; even if it is available it requires high maintenance cost and expertisation. Bleeding in oropharynx can obscure vision with Fiber optic laryngoscope. (3) Retrograde catheter

intubation is well known alternative for securing the airway in difficult airway algorithm. Applied anatomy of the cricothyroid membrane and retrograde approach has several advantages including absence of bleeding as there are no vessels and fewer chances of subglottic oedema and stenosis. Insertion of nasopharyngeal airway is very important. The main site of nasal narrowing is the nasal valve. To overcome this obstruction we introduced a lubricated nasopharyngeal airway.

Retrograde intubation technique was described originally by Watters. A number of technical and procedural problems may arise using this method. According to availability of retrograde intubation set, venous catheter, epidural catheter or seldinger's wire can be used for retrograde intubation technique. Due to unavailability of retrograde intubation set, we used epidural catheter with 18G hypodermic needle which is available everywhere. The tendency of a soft epidural catheter is to exit orally and with our technique it can be made to come through the nose. (4) An epidural catheter was selected to minimize trauma. An epidural catheter can be kept in situ after the airway is secured and because of its flexibility the tracheal tube can be easily advanced beyond the catheter insertion site without trauma.

A prospective randomized study done by Gaurav Jain (5) and his colleague, they had used J tipped vascular guide wire and modified tracheal tube guide with side eye for retrograde intubation to avoid laryngeal trauma. In our study we did not find any difficulty in retrieving epidural catheter retrogradely.

According to Virendra Arya et al, (6) pharyngeal loop can be utilized for successful retrograde intubation. Bhattacharya et al (7) had used a suction catheter with negative pressure to retrieve the tip of coiled epidural catheter blindly. Shaila Kamath et al (8) had modified the retrograde intubation technique by using nasopharyngeal airway as a guide to J type guide wire to come through nose. A case study done by R. Krishnaprabu and V. Prabu, (9) they find difficulty in retrieving J tipped guide wire retrogradely in case of T.M. Ankylosis. To solve this problem they used bougie passed through endotracheal tube into trachea. In our patient we retrieved catheter from mouth without any difficulty and it was railroaded via infant feeding tube through nose.

Literature reported that death from loss of airway still occurs in patients with difficulty in airway. Data suggested that in absence of fibreoptic device, retrograde intubation technique is simple, Non traumatic and does not add any complication. Mounir et al (10) had fixed a gliding knot of catheter around the side hole of tracheal tube to pull and

guide the tracheal tube down the larynx and trachea. This technique is fast, relatively Non traumatic, easy to perform and eliminates cause of failure. S.Ghosal and A.Singam<sup>(11)</sup> showed in their study that instead of endotracheal tube, ventilating bougie can be used for retrograde intubation in case of bilateral TMJ Ankylosis, they also used J tipped guide wire in addition to ventilating bougie for easy sliding, better ventilation of the patient and to avoid trauma. In our case we were successful in sliding endotracheal tube over epidural catheter without trauma. In our case, we had used infant feeding tube to assist passage of retrograde catheter for successful retrograde intubation. This technique can be utilized as a safe and cost effective alternative in centers which are unequipped with fiber optic laryngoscope.

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