

# Retrograde nasal intubation in a case of ankylosing spondylitis of cervical spine posted for CABG surgery.

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## Abstract :

Ankylosing spondylitis is characterized by progressive ossification of spinal column with resultant stiffness. These patients are most challenging and they present the most serious array of intubation and difficult airway imaginable, secondary to decrease or no spinal cord mobility, fixed flexion deformity of thoracolumbar spine and possible temporomandibular joint disease. We report a case of difficult intubation in a patient suffering from long standing cervical ankylosing spondylitis undergoing Coronary Artery Bypass Graft (CABG). The anaesthetic management of 53 year old patient with difficult airway was performed by retrograde nasal intubation.

**Keywords :** cervical ankylosing spondylitis, difficult airway, awake difficult intubation, retrograde intubation.

## Introduction

Inability to manage difficult airway has been responsible for as many as 30% of the total death attributable to anaesthesia.<sup>1</sup> Ankylosing spondylitis (AS) is characterized by progressive ossification of the spinal column with resultant stiffness.<sup>2</sup> Cervical spine involvement in ankylosing spondylitis is of great concern for the Anaesthetist. Spine mobility is decreased and in severe cases total fixity occurs in a flexed position.<sup>3</sup> Deranged anatomy and failure of blind nasal intubation and tracheostomy is not practical in this cases, making the retrograde tracheal intubation technique favourable, simple and effectively possible technique.<sup>4</sup>

## Case Report

A 53 year old male patient coolie by profession for 18-20 years was scheduled for Coronary Artery Bypass Grafting (CABG). 30 years back had an incident where a heavy bag was fallen on his head and later slowly over a period of 5 years he developed restriction of neck movements. He came to our hospital with complaints of chest pain since 15 days and was diagnosed as Acute Anterior Wall Myocardial Ischemia. Coronary angiogram revealed triple vessel disease.

On the preoperative airway assessment, the patient had

normal mouth opening, with Mallampatti Class IV, teeth intact. No neck movements including flexion, extension and rotation. Thyro- mental distance 4.5 cms (<3 fingers), neck circumference 46 cms, Sterno -mental distance 5 cms, Atlanto- Occipital angle < 12 degree. Hence difficult mask ventilation, laryngoscopy and tracheal intubation were anticipated. Fig 1 shows patient posture .On systemic examination there was no limitation of chest expansion and no neurological abnormalities.

On ENT consultation, nasal passages were normal, curled epiglottis, bilateral arytenoids congestion present vocal cords movements normal in NPL scopy. All routine investigations were within normal. X-ray neck AP and Lateral view (Fig 2) showed Loss of cervical lordosis with straightening. Air way appears patent. Degenerative changes as well as fusion of vertebrae noted. Scannogram revealed fixed flexion deformity of cervical spine as evident by the position (Fig 3). Saggittal reformatted CT image (bone window) of cervical spine (Fig 4) revealed straightening of cervical lordosis with fixed flexion deformity with bony ankylosis of the Atlanto-occipital joint and atlant- axial joint. Ossification of the anterior longitudinal ligament extending along the visualized extent of cervical and upper dorsal vertebrae.

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Fig 1; Anterior and Lateral view of patient's fixed flexion deformity.



Fig 2; X-ray neck; AP and Lat view



Fig 3: Scannogram



Fig 4: Sagittal reformatted CT image (bone window) of cervical spine

Looking at various clinical and radiological deformities, we planned and kept ready for fiberoptic intubation and for retrograde intubation. Detail procedure for awake retrograde intubation was explained, and informed consent was taken. Trial of positioning on tipping operation table was given, so that support could be designed to suit the patient's curvature during intubation. Patient was premedicated with 0.2 mg of glycopyrrolate IV and 5mg of morphine injection IM 30 min before shifting to Operation Theatre. Topical anaesthesia and decongestion was achieved by lignocaine 4% and xylometazoline 0.1% nasal pack. Approximately 10% viscous lignocaine gargles and 10% lignocaine spray was given for oropharyngeal anaesthesia. Total lignocaine dose was kept below 3 mg/kg. Routine monitoring with hemodynamic changes were noted. A surgeon asked to be on standby for possible emergency tracheostomy.

Adequate supports with two pillows to suit the existing deformity of cervical spine and two bolsters were placed under the legs to provide a comfortable and for better visualization of larynx. Oxygen was supplemented with nasal prongs. Under aseptic and antiseptic precautions, superior laryngeal nerve block was given with 2 mL of 2% lignocaine (plain) after negative aspiration on either side just above thyroid cartilage, at a point 1/3rd distance from midline and tip of superior cornu. Needle advanced 1-2 cm upwards and medially after 'give in' with great difficulty due to bending forward posture, crowding of all anatomical landmarks in the anterior neck. Cricothyroid membrane was palpated, which was very narrow and infiltrated with 1 mL 2% lignocaine. After Local anaesthesia 23 G 1.5 inch hypodermic needle was passed cranially through the membrane with saline-filled syringe. Tracheal puncture was confirmed by an air aspiration and 4 ml of lignocaine 1% was injected.

Initially we started with fiberoptic intubation but we were unable to visualize the vocal cords. So we decided to go ahead with retrograde intubation. Tracheal puncture was done with introducer needle 18G x7 cms. Teflon guide wire of length 150cms was passed through the needle. We retrieved the guide wire through the mouth. We tried to pass the ET tube over the guide wire but failed. So we planned to retrieve catheter through the nostril and for that, we railroaded the catheter through nostril by nasogastric tube. 7.5 mm cuffed Endo Tracheal Tube was passed over the guide wire which could not be negotiated into the larynx. So we passed Portex Bougie 15 Fr, 6-11 mm over the guide wire and guide wire was removed by pulling out from tracheal side. Then the Endo Tracheal tube was passed over the Bougie. Confirmation of endotracheal tube position was done by

auscultation and capnography. Induction of GA was done with propofol 2 mg/kg and vecuronium 0.1 mg/kg IV. Anaesthesia was maintained with sevoflurane and vecuronium. Analgesia was supplemented with repeat dose of fentanyl. Patient shifted to ICU for elective mechanical ventilation. Post-operative analgesia was provided with Fentanyl infusion.

### Discussion

The ease of tracheal intubation greatly relies on glottis view quality during laryngoscopy. Glottis view obtained in patients with restricted head and neck movements and cervical spine immobility are poor. This may lead to inability to achieve optimal sniffing position.<sup>5</sup> In patients with difficult airway, several techniques are available like blind nasal intubation, retrograde intubation via cricothyroid puncture or fiberoptic intubation.<sup>6</sup>

Awake fiberoptic intubation is considered as the gold standard in management of anticipated difficult airway.<sup>7</sup> However the technique is difficult due to inability to visualize the larynx or sometimes inability to guide the tube over fiberoptic and it requires more expertise and long learning curve.<sup>8</sup> Blind nasal intubation is the method for ET insertion. But due to severe flexion deformity with distorted anatomy, failure of blind nasal intubation is very common.<sup>9</sup>

Retrograde intubation was originally described by waters in the early 1960s.<sup>10</sup> 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 edema and stenosis.<sup>11</sup>

### Conclusion

Data suggest that in the absence of fiberoptic devices or failure of fiberoptic intubation, retrograde intubation is the safe, simple and effective technique. We conclude that retrograde intubation is a good option for elective intubation in patients with difficult airway and presenting with restricted neck movements.

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