

# Modified Technique Of Retrograde Intubation Using Ventilating Bougie

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## Abstract

We report a 14-year-old, ASA grade I female who presented with a mouth opening of 5 mm. The patient complained of trismus since she was 2-years-old due to trauma to the mandible. She was diagnosed as a case of bilateral TMJ ankylosis and was posted for interpositional gap arthroplasty. Due to the unavailability of fiberoptic bronchoscope, retrograde intubation was planned. A modified technique of retrograde intubation was done, where ventilating bougie was used along with J tipped guide wire, which made the intubation easier and reduced the chances of trauma.

## INTRODUCTION

Securing of the airway is very important in the operation theater and ICU. Difficult airways are secured by various techniques. Fiberoptic bronchoscopy is the gold standard, but non-availability of the fiberoptic bronchoscopes leads to use of age-old techniques like blind nasal and retrograde intubation<sup>1</sup>.

Retrograde tracheal intubation is simple and quick in experienced hands<sup>2</sup> and is indicated in various clinical situations, including cervical and facial trauma and limited mouth opening<sup>3,4</sup>. Many modified methods of retrograde intubation have been tried before<sup>5,6,7</sup>. However, the success rate of retrograde intubation is variable<sup>8</sup>.

## CASE REPORT

A 14-year-old, ASA grade I female presented with complaints of restricted mouth opening. Mouth opening was 5 mm. She gave a history of trauma at the age of 2 years. She was diagnosed as a case of bilateral fibrous ankylosis of TMJ. Her neck mobility was normal. Both her nasal nares were patent. Radiological examination ruled out any significant narrowing of airways. No history of hoarseness of voice, breathlessness, difficulty in swallowing or frequent sleep awakening at night was noted.

Figure 1



**Figure 2**



In view of airway difficulty and non-availability of fiberoptic bronchoscope, awake retrograde technique was planned. After explanation of the procedure, an informed consent was obtained from the parents regarding retrograde intubation. Tracheostomy consent was also taken in case of failure.

Apart from the usual preparation of difficult intubation, we used the following items for retrograde intubation:

The patient was premedicated with glycopyrolate  $10\text{mcgkg}^{-1}$ , hydrocortisone  $5\text{mgkg}^{-1}$ , midazolam  $0.03\text{mgkg}^{-1}$ , butraphenol  $0.04\text{mgkg}^{-1}$ . Xylometazoline nasal drops along with lignocaine (2%) jelly were used in the nasal passages. Bilateral superior laryngeal nerve block was given. The skin above the cricothyroid membrane was infiltrated with 1% lignocaine 1-2ml. Cricothyroid membrane was punctured with 16G Touhy epidural needle. Tracheal placement was confirmed by aspiration of air in a 4% lignocaine filled syringe. A J-tipped guide wire was inserted through the needle. The guide wire emerges from the nostril, and not through the mouth, as the guide wire takes the route of least resistance, which is along the curve of the posterior pharyngeal wall. The cricothyroid end of the guide wire was held with an artery forceps. In case the guide wire emerges through the mouth, a 12G suction catheter was kept in hand. The suction catheter could then be introduced through the nose, and when it emerges from the mouth, the guide wire could be manipulated back through the suction catheter through the nostril. A lubricated ventilating bougie was passed over the guide wire, through the nostril. The guide wire was removed, and the bougie was further introduced in the trachea. Tracheal placement was confirmed by attaching a connector of ETT NO 5 to the bougie and attaching it to

the  $\text{ETCO}_2$  probe.

**Figure 3**



The patient was sedated with propofol  $1\text{mgkg}^{-1}$ . A flexo metallic endotracheal tube was passed over the bougie and the bougie was removed. Tracheal placement of ETT was reconfirmed by capnograph.

**Figure 4**



The muscle relaxant- vecuronium  $0.1\text{mgkg}^{-1}$  was given and anesthesia was continued with oxygen, nitrous oxide and sevoflurane. At the end of surgery, after thorough suctioning, the patient was reversed with neostigmine and glycopyrolate and transferred to the ICU for observation. The patient was extubated after 24hrs, which was uneventful.

## DISCUSSION

Retrograde intubation was first described in 1960<sup>1</sup> and since then many modifications have been tried<sup>5,6,7</sup>. Although

fiberoptic techniques may be the preferred method, as it permits direct visual control of the intubation, in developing countries due to unavailability, its usage is rare and it requires expertise to use. Traditionally, blind nasal access was recommended, but because of high rate of failure and trauma, retrograde is more preferable<sup>9</sup>.

Traditional techniques of retrograde intubation use epidural catheter. We used J tipped guide wire instead. J tipped guide wires are easily available, negotiates the curved passage of larynx, pharynx, nasopharynx, nasal passage easily. As the airway is shared with the surgeon, flexometallic tube is preferred over regular ETT. It is difficult to slide the flexometallic ETT over the guide wire directly, so a ventilating bougie was used over the guide wire. The bougie allowed easy sliding, could help to ventilate the patient, and reduces the incidence of trauma caused by sliding the regular ETT directly over the guide wire.

To conclude the use of J tipped guide wire, along with the ventilating bougie helped in making the intubation process easier, and reduced the incidence of trauma.

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