CASE REPORT

A Case Report of Retrograde Intubation: An Alternative for Difficult Airway

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Abstract

Retrograde intubation (RI) can be successfully used in awake, sedated, obtunded, or apneic patients who have either an anticipated or unanticipated difficult airway. The American Society of Anesthesiologists (ASA) describes RI as an alternative approach to difficult intubation in the nonemergent pathway as per their difficulty airway algorithm. It is also used as an alternative when fiberoptic scope is not available. We discussed a case of nasopharyngeal carcinoma with a difficult airway, who developed fibrosis of neck soft tissue postradiotherapy. We managed to do the RI and found it to be an effective and safe alternative in the management of a nonemergent, difficult airway.

Keywords: Airway management, Case report, Intubation, Nasopharyngeal carcinoma, Retrograde.

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Introduction

In 1960, Butler and Carillo introduced retrograde intubation (RI) as a desired option for managing a difficult airway, which is an effective alternate option in cases of neck surgery.[1] RI can be successfully used in awake as well as sedated patients; they may either have an anticipated airway anomaly or an unanticipated (altered) difficult airway. American Society of Anesthesiologists (ASA) describes RI as a successful alternate approach in cases of difficult intubation in a physical nonemergent pathway, which was included in their "difficult airway algorithm."[2] When fiberoptic scope is not available, RI can be used as an alternative for the management of difficult intubation.[3]

During fiberoptic scope, if bleeding occurs in the oropharynx, it will obscure the airway; it will be difficult even for an expert anesthetist to manage this situation, which necessitates an alternative technique. There may be several attempts needed in situations like intubation. Although it poses a high risk of complications, emergency tracheostomy can be carried out prior to the procedure. A submental approach to tracheal tube insertion is an additional technique. A number of consequences, including skin scarring, infections, soft tissue injuries, damage to the salivary glands, and most crucially, nerve damage, are linked to temporomandibular joint ankylosis with aberrant airway structure, making this impractical. An alternative method is required in these circumstances. If alternative techniques for creating an airway are unsuccessful, RI can be used to establish a permanent airway in those patients.

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Case Description

Patient Factors

A middle-aged female patient with a known case of nasopharyngeal carcinoma underwent radiotherapy. Postradiotherapy, the patient developed fibrosis of the soft tissues of the neck. She came to the hospital with complaints of difficulty in opening her mouth, was not able to consume a normal diet, and was posted for a myotomy of masticatory muscles. During the preanesthetic checkup, the patient had features including fibrotic skin over the neck and the angle of the mouth region; mouth opening was less than two fingers; hence, they could not perform Mallampati scoring (Fig. 1). The

Fig. 1: Showing restricted mouth opening with asymmetrical facial feature

Fig. 2: Showing fibrotic tissue of neck and angle of mouth

nasal patency was normal and was not able to examine the dentures. Slight restriction and extension of the neck were present (Fig. 2). Chest radiograph and electroencephalogram findings were normal. Room air saturation was 98%, with a pulse rate of 82/minute and blood pressure of 120/70 mms of mercury. She was assessed under ASA 3.

Anesthetic Management

The plan of awake RI was explained to the patient, and informed consent was obtained. After shifting to the operation theater, standard monitors were connected. The patient was premedicated with intravenous (IV) glycopyrrolate: 0.2 mg and IV midazolam: 1 mg. From then continuous saturation monitoring was done along with other mandatory monitors. Before the procedure, the airway patency could not be checked because of the nonavailability of fiberoptic intubation (FOB). The oral cavity was anesthetized with 10% lignocaine spray. Both nostrils were packed with ribbon gauzes soaked with 2% lignocaine with adrenaline. B/L superior laryngeal nerve block by palpating greater cornua of hyoid bone and 2 mL of 2% lignocaine was given. Following this, a transtracheal block was given with 4 mL of 4% lignocaine. Cricothyroid membrane (CTM) was identified by palpating the upper border of the cricoid cartilage, it was a difficult anatomy, so we confirmed the cricoid cartilage with the use of ultrasound. Under all aseptic precautions, skin and subcutaneous tissue were infiltrated with 2 mL of 2% lignocaine.

Fig. 3: Showing insertion of an epidural catheter through 18G Tuohy needle

18G Tuohy needle attached to a saline-filled syringe was inserted through the membrane with a bevel end facing the cephalic direction. The position was confirmed by the aspiration of air bubbles (Fig. 3). An 18G catheter (Tuohy: Portex) was inserted and taken out from the right nostril in the second attempt; initially, it went to the oral cavity. A size 7 flexometallic endotracheal tube (ETT) was railroaded over the catheter nasally and successfully inserted into the trachea to prevent kinking during the sharing of airways. The ETT was passed inside the trachea smoothly over the catheter, and the catheter was withdrawn. The position of the tube was confirmed by auscultation and capnography. The surgical procedure was uneventful. Intraoperatively, the patient had stable vitals, followed by which the patient was extubated after adequate reversal. The patient had no pain or any other complications and was shifted to intensive care for monitoring.

Discussion

A clinical scenario known as a "difficult airway" occurs when an anesthesiologist with standard training finds it difficult to perform tracheal intubation, mask ventilation, or both.[2] Securing the airway while the patient is awake is the safest method of managing the airway when difficult mask ventilation and difficult intubation are anticipated. Minor bleeding in the oropharynx can cause obstruction of the airway with a fiberoptic laryngoscope, even for an experienced anesthesiologist.

In cases with a threatened airway, the primary benefit of retrograde tracheal intubation (RTI) over traditional awake

flexible scope intubation is the ability to use when blood, mucus, or supraglottic masses (particularly oropharyngeal or nasopharyngeal masses) block a clear view of the laryngeal inlet. A compromised airway can result in death; hence, managing the airway is extremely important in patients with maxillofacial trauma, like our patients with facial fractures or cervical spine injuries. The technique to adopt while intubating these patients is still up for debate. The choice will ultimately depend on the patient's circumstances and the anesthesiologist's skill, despite the fact that there are numerous choices available, each of which has specific indications.

Difficult intubation is defined as the glottis not being visualized and failure to do the tracheal intubation (inability to insert a tracheal tube from the oropharynx into the trachea). The RI approach may be helpful for patients with airway mass, multiple facial traumas, trismus (injury/pathological), congenital ankylosis of the jaw and cervical spine, and trauma patients needing cervical spine immobilization.

Most of the time, the bronchoscope served as the best antegrade guidance for fitting the ETT in position. Both fiberoptic and RI are capable of producing the "hanging-up phenomenon" that is infrequently noted. It can happen at the vocal cords, arytenoid cartilages, or the epiglottis and is virtually always treated with straightforward techniques. Since the ETT must be inserted into the trachea, the bronchoscope in retrograde flexible intubation (RGFI) is superior to the venous catheters, peridural catheters, and Seldinger guidewires used in retrograde methods. After the guidewire is removed, fiberoptic intubation eliminates a significant potential risk associated with the retrograde technique. A significant safety aspect in this stage is visual control of the intubation procedure.

Retrograde intubation (RI) is a well-documented method of orotracheal or nasotracheal intubation that entails passing an ETT retrogradely through the cartilage of the larynx and pharynx after it has been percutaneously inserted through the CTM.[4–8]

Nasal intubation is preferred by maxillofacial surgeons because it allows them greater operating freedom and improves dental occlusion accuracy. The bulk of the time, we performed nasal intubations as a result of this requirement. This accuracy of dental occlusion may be compromised by oral route endotracheal intubation.

The fact that the laryngeal inlet does not need to be discovered or negotiated makes this technique superior to popular anterograde tracheal intubation methods. Instead, a retrograde guide that was earlier implanted percutaneously inside the larynx is railroaded over the tracheal tube as it is inserted. This guide's purpose is to maintain the tracheal tube's tip in the middle of the mouth and pharynx, enabling the tube's passage through the upper airway and into the larynx.

Retrograde intubation (RI) is less invasive than surgical cricothyroidotomy/tracheostomy. The equipment needed for RI is considered a must-have equipment in the difficult airway cart.[2,5,6]

Retrograde intubation (RI) can be considered in the below conditions[9,10]:

- Maxillofacial trauma cervical spine fracture.
- Failed orotracheal intubation attempts.
- Maxillofacial trauma.
- Cervical spine fracture.
- Blood and secretions in the airway jaw ankylosis.
- Cervical arthritis.
- Mouth tumors.
- Muscular dystrophy.
- Restricted mouth opening rheumatoid arthritis.
- Ankylosing spondylitis airway tumors.

Conclusion

An efficient and secure substitute for traditional methods when managing a challenging airway is RI. Under the right circumstances, the procedure can be carried out quickly, simply, and safely. It can also save patient lives by preventing hypoxia, airway trauma, open cricothyrotomy, and tracheostomy.

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