Case Report

Retrograde Intubation in a Patient Status Post Subtotal Maxillectomy with Restricted Mouth Opening

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Abstract

Retrograde intubation is one of the techniques, which is useful for difficult airway management. Selecting the method of airway intervention in a difficult airway scenario depends on clinical judgment and experience of the attending anesthesiologist. Retrograde intubation stands as one of the better alternatives in the settings where fiberoptic bronchoscope is not available. We successfully managed a case of status post (s/p) subtotal maxillectomy and reconstruction left tensor fascia flap and s/p tracheostomy decannulated with raw wound over neck posted for right deltopectoral flap cover by awake retrograde intubation.

Keywords: Difficult airway, restricted mouth opening, retrograde intubation

Introduction

Retrograde intubation is one of the useful techniques, which is recognized for difficult airway management.[1] However, with the availability of techniques such as fiberoptic bronchoscopy and videolaryngoscopy, retrograde intubation has taken a back seat. Mismanagement of difficult airway has been the reason for about 30% of total anesthesia-related deaths.[2] According to the ASA, difficult airway algorithm awake intubation is one of the safe measures to secure airway in case of difficult airway.[3] Awake fiberoptic intubation is the best acceptable method to secure airway, but retrograde intubation stands as one of the acceptable alternatives where fiberoptic bronchoscope is not available.

Case Report

A 60-year-old male, a known case of carcinoma of the right maxilla, status post (s/p) subtotal maxillectomy, modified radical neck dissection, and reconstruction with left tensor fascia flap and s/p tracheostomy decannulated with raw wound over neck posted for right deltopectoral flap cover.

Pre-operative issues were as follows:

- Difficult airway (restricted mouth opening 1 cm)
- Nonfunctioning fiberoptic bronchoscope
- Difficult intravenous (IV) access
- Chest X-ray – bilateral resolving opacities (bronchopneumonia)
- Smoker and alcoholic
- Hepatitis B virus surface antigen-positive status.

1. Plan A – Retrograde intubation because of nonfunctioning fiberoptic bronchoscope

The patient was being explained about the procedure and possible outcomes and consent was obtained for the same.

2. Plan B – Elective retracheostomy

The patient was shifted to operating room, monitors were connected, and baseline vitals were noted. The patient was nebulised with lignocaine 4%; nasal oxymetazoline drops were applied. Topical lignocaine spray 10% was applied over the posterior pharyngeal wall, transtracheal block was given with injection lignocaine 4% 3cc.

Under strict aseptic precautions, cricothyroid membrane was punctured with 16G IV cannula, intratracheal position of cannula tip confirmed by aspiration of air and then a

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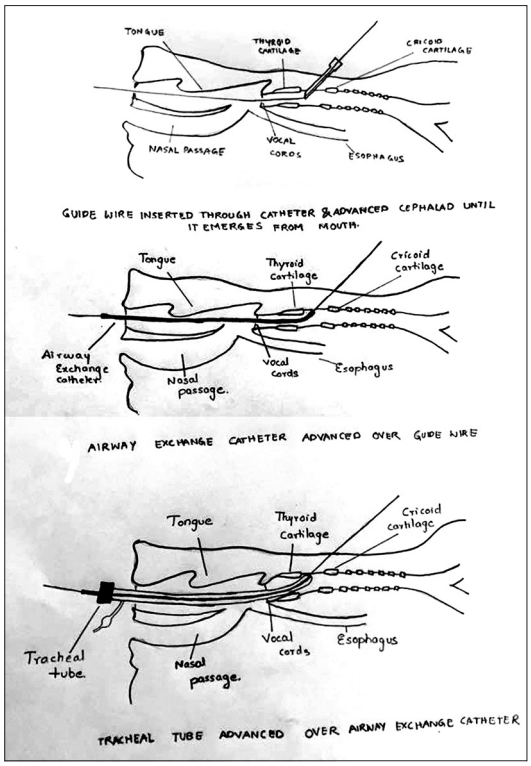

Figure 1: Line diagram of retrograde intubation

flexible guide wire was threaded into trachea and passed till it came out of the mouth. A 14F suction catheter was passed into the left nostril and directed into mouth and the guide was passed through the suction catheter and brought out through the left nostril; suction catheter was removed after guidewire was stabilized. Intubation catheter was passed over the guidewire. Size 7 flexo-metallic cuffed endotracheal tube was inserted over the intubation catheter; once the tube was in place, intubation catheter and the guide wire were removed [Figure 1]. Position of the endotracheal tube was confirmed by capnogram trace. The patient was induced by injection propofol 60 mg and fentanyl 100 mcg, relaxed with vecuronium 4 mg, and connected to volume-controlled ventilation mode of ventilation. Right femoral vein was cannulated with 7F double lumen central line by modified Seldinger's technique.

Intraoperative period was uneventful, at the end of surgery, patient reversed, not extubated and shifted to the Intensive Care Unit on T-piece. The patient was extubated a day later and shifted to the ward.

Discussion

Management of difficult airway is a dreaded challenge for any anesthetist. Proper planning, timely decision, and use of various techniques will help anesthetist to decrease mortality and morbidity caused by anticipated and unanticipated difficult airway scenarios.[4] Awake fiberoptic bronchoscopic intubation is a safe and reliable technique for securing airway, especially in patients who have decreased mouth opening requiring nasal intubation (e.g., temporomandibular joint [TMJ] ankyloses, carcinoma buccal mucosa, s/p head and neck flap). However, fiberoptic bronchoscope is not devoid of limitations. The view of fiberoptic bronchoscope will be obscured in the presence of bloody secretions, and technical expertise is needed for its use. Other alternatives to fiberoptic bronchoscope are blind nasal intubation and retrograde intubation.

Retrograde endotracheal intubation was described by Butler and Cirnello in 1960.[5] It is a safe and successful technique that has a role in both anticipated and unanticipated difficult airway scenarios.[6]

In a case report published by Hasani *et al*., they successfully intubated a patient with Goldenhar syndrome by retrograde intubation technique after failed fiberoptic bronchoscopy and conventional laryngoscopy.[6] Raval *et al*. successfully secured airway by awake retrograde intubation in a patient with ankylosing spondylosis with no cervical spine mobility and fixed flexion deformity of thoracic and thoracic-lumbar spine.[2] Battacharya *et al*. successfully intubated two patients with TMJ ankyloses by retrograde intubation after failed blind nasal intubation in a setup where fiberoptic bronchoscope is not available.[8]

Our institutional protocol for difficult airway cases with restricted mouth opening is awake fiberoptic bronchoscopy, but we attempted retrograde intubation as first choice (plan A) in this patient because of our fiberoptic bronchoscope was not functioning and had been sent for repair the previous day. We had not received a standby device from the manufacturer, and the repair of our bronchoscope was scheduled to take more than 6 weeks and hence had no other choice, but to take up the case. The patient had raw wound over submental region which even makes mask ventilation difficult. Hence, this patient may go into "complete ventilation failure" category as per the AIDAA 2016.[9]

Challenging task for anesthesiologist is not only passing the guidewire from cricothyroid membrane but also bringing it out from the nose. Bhattacharya *et al*. reported a case where they retrieved retrograde catheter using suction.[8] In a case report by Arya *et al*., they advanced the Ryle's tubes (nasogastric tube) through right nare and advanced it with cricoid pressure so that it will be coiled in the mouth and later removed it from mouth using pharyngeal loop.[10] Similarly, we passed suction catheter from right nostril, but we were able to bring it out of mouth without use of pharyngeal loop.

We successfully intubated s/p maxillectomy and tensor fascia flap patient, posted for deltopectoral flap by awake retrograde intubation.

Retrograde intubation would be a better alternative to awake fiberoptic intubation in scenarios where awake intubation is required. However, retrograde intubation carries its own set of complications such as airway trauma, inadvertent entry of guide wire into lungs causing pneumothorax, subcutaneous emphysema, pneumomediastinum, and infection. Retrograde intubation needs technical expertise to perform which goes against the use of this method.

The incidence of deaths caused by mismanagement of difficult airway is still persisting. In the absence of fiberoptic device, retrograde approach via catheter is one of the safe and effective alternatives.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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