

Flexible Intubation Videoscope-Guided Replacement of Tracheostomy Tube in a Carcinoma Larynx Patient with Extensive Subglottic Involvement

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Abstract

Subglottic narrowing or alteration can cause difficulty in tracheostomy. Although no specific technique has been mentioned in the literature, various procedures have been advocated to increase accuracy and to minimize complications. Here, we describe a case where flexible intubation videoscope was used for successful location of tracheal lumen and insertion of the tracheostomy tube.

Keywords: Carcinoma larynx, flexible intubation videoscope, tracheostomy

INTRODUCTION

Tracheostomy is the procedure of choice for securing the airway in patients with advanced carcinoma larynx presenting with severe respiratory distress.^[1] However, inserting or repositioning the tracheostomy tube in such cases can be a challenge, especially in patients with distorted neck anatomy, and may result in loss of airway,^[2] hypoxia, and rarely cardiac arrest.^[3] Various techniques have been advocated to increase accuracy and to minimize complications. Here, we describe a case where flexible intubation videoscope (Karl Storz, series 11301ABX, 11302 BDX, and 11301 BNX) was used for successful location of tracheal lumen and insertion of tracheostomy tube.

CASE REPORT

We report a case of a 45-year-old patient with carcinoma larynx who presented with stridor and tachypnea to ear, nose, and throat outpatient clinic (outpatient department). A diagnosis of severe upper-airway obstruction was made, and tracheostomy was planned. The patient was shifted to a minor operation theater, and open tracheostomy was started under local anesthesia. However, on opening the neck, it was found that growth extended into the subglottic area, resulting in a problem in demarcating tracheal planes. There was difficulty in passing the tracheostomy tube, and repeated

attempts resulted in creation of a false passage. Meanwhile, the patient developed severe hypoxia and went into cardiac arrest. Cardiopulmonary resuscitation (CPR) was started, and airway was secured by 7.0 number cuffed tracheostomy tubes. Although CPR was successful and the patient was revived, he became unconscious and required postoperative ventilator support. Hence, the patient was shifted to intensive care unit and placed on a ventilator.

On posttracheostomy day 22, the patient developed upper-airway obstruction with bilateral decreased air entry in chest and inability to pass the suction catheter through the tracheostomy tube. As it was a case of carcinoma larynx involving subglottic area, it was decided to pass the suction catheter along the already inserted tracheostomy tube and railroad a new tracheostomy tube over it. While railroading the tracheostomy tube, the patient had an episode of severe cough resulting in displacement of suction catheter. The patient was able to breathe through the tracheostomy stoma, maintaining a saturation of around 90% on air with a respiratory rate of

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30–35/min. As it was not possible to locate the tracheal lumen inside tracheostomy stoma by direct vision [Figure 1], blind insertion of tracheostomy tube might have resulted placing the tube in false passage. Hence, flexible videoscope-guided insertion of tracheostomy tube was planned.

Flexible videoscope was inserted through the tracheostomy stoma. After advancing for about 2 cm, a small slit was visible in the left upper region [Figure 2] that was opening and closing with patient's respiration. As flexible intubation videoscope was advanced, posterior part of tracheal tissue was visible, demarcating the trachea from the false passage [Figure 3]. Flexible intubation videoscope was slowly advanced into the tracheal lumen. Inside tracheal rings were visible [Figure 4] and bronchoscope was advanced till carina. Tracheostomy tube was then guided over the fiber-optic maintaining carina of trachea in flexible videoscope view. After the insertion, videoscope was gradually withdrawn, confirming the position of tracheostomy tube while removing the flexible endoscope. Tracheostomy tube was secured, and the patient was again connected to a ventilator.

DISCUSSION

The case we presented here was a typical case of subglottic narrowing of airway due to laryngeal carcinoma. In addition, previous attempts during tracheostomy have resulted in the creation of false passages and distorted airway anatomy. Further position of tracheal opening was 2–3 cm below the tracheostomy site, causing difficulty in locating the passage to tracheal lumen. Such cases are particularly challenging to manage. Various authors have described different techniques to successfully secure airway in patients with subglottic narrowing, such as the use of small-sized endotracheal tubes (ETTs) and supraglottic devices such as laryngeal mask airway I gel,^[4] railroading over catheter or guide wire,^[5] retrograde intubation,^[6] and transtracheal jet ventilation.^[7]

The use of small-sized ETTs (size 3.5 and 4.0) was considered. However, they were not the first choice, as it would have increased the work of breathing and such small lumen would be more predisposed to repeated obstruction. Transtracheal jet ventilation also could not be used in our case. Since it



Figure 1: Open tracheostomy site

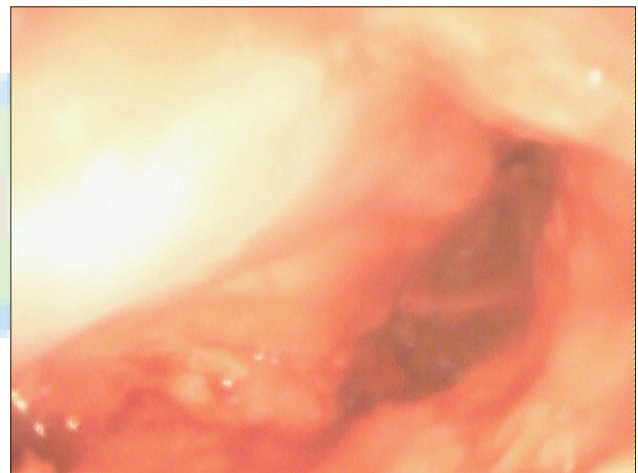


Figure 2: Tracheal opening visible with false passage below through flexible intubation videoscope

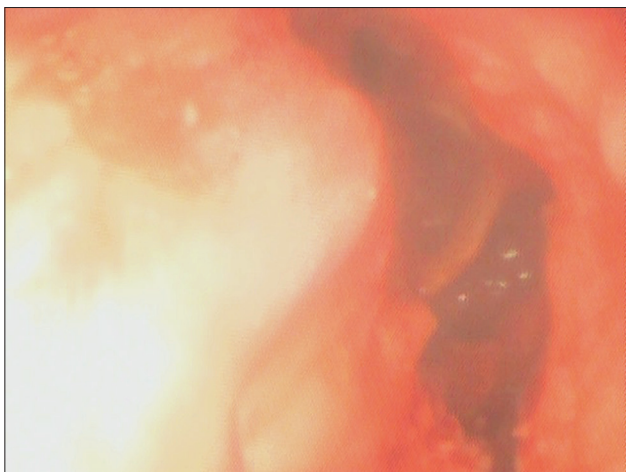


Figure 3: Lower border of tracheal tissue between the trachea and false passage



Figure 4: Tracheal rings visible inside the lumen

was difficult to locate the tracheal lumen, the catheter could be misdirected, resulting in pneumothorax or subcutaneous emphysema.^[8] That could have worsened the chest condition of the patient. Hence, tracheal tube exchange over catheter was attempted initially. However, once that catheter was displaced, it became very difficult to secure trachea. The use of flexible videoscope in this case resulted in a direct visualization of slit-like tracheal opening. Further, it was possible to confirm the correct tube placement by locating the carina. Once the trachea was confirmed, a new tracheal tube was railroad over the flexible intubation videoscope. This is the first such case where loss of airway during tracheostomy was successfully managed using flexible intubation videoscope.

Loss of airway during tracheostomy is not new.^[2,9,10] It has been shown to be associated with devastating complications including cardiac arrest.^[2] Various approaches have been described in the literature including the use of small-sized ETT and^[2] digital palpation of trachea.^[9,10] Although some authors have advocated digital palpation, it requires clinical experience and after confirmation the finger needs to be removed to pass the tracheostomy tube. That can be difficult with the presence of a false lumen as was there in our case. Furthermore, the use of flexible videoscope provided visual confirmation of tracheal placement, further reducing the chances of unintended errors. Hence, this approach can be tried as the first choice in patients with distorted subglottic anatomy and displaced tracheostomy tube. However, one should exercise caution in case of primary tracheostomy as blood and mucous at tracheostomy site may obscure the flexible videoscope view.

CONCLUSION

Flexible intubation videoscope through tracheostomy opening can be used to successfully secure airway in patients with loss of airway during tracheostomy tube replacement due to distorted subglottic anatomy.

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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