



Tracheal Intubation Using Nelaton Catheter: A Simple Device, an Airway Rescue Option

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Abstract

Although anticipated, difficult airway could turn into a catastrophe for health care providers, where planned strategies and equipment become useless. We report a challenging airway management process due to narrowed upper airway by the application of a Nelaton catheter as a rescue device. **Keywords:** Airway management, difficult intubation, laryngeal mass, nelaton urinary catheter

Introduction

Complex surgeries on airway demand advanced intubation techniques. While many modern appliances are introduced to anaesthesiologists every year, acquaintance with the anatomy of the patient is the cornerstone in successful management of airway instrumentation. In skilled hands, simple appliances could be upgraded to rescue devices. We represent an anticipated difficult airway due to laryngeal carcinoma and discuss the use of a Nelaton catheter as a rescue instrument. The patient signed the informed consent to publish the related data and photos for scientific purposes.

Case Presentation

A 63-year-old male referred to the operating theater, complaining of hoarseness during the past four months, as a candidate for biopsy of laryngeal mass. He reported habitual smoking (30 pack years). He also mentioned weight loss over the course of one year. Indirect laryngoscopy in an otolaryngology clinic reported visualization of mass involving right-sided false vocal cord (FVC) and true vocal cord (TVC), arytenoids, and ventricle and pyriform sinus, while TVC paralysis and cord immobility of the same side were observed. All the above were normal on the right-side. Also, epiglottis and the base of the tongue were not involved.

The contrast-enhanced computed tomography (CT) scan of the neck demonstrated mass involving the right TVC, FVC, and aryepiglottic fold with severe narrowing of the laryngeal airway. A cyst-like lesion was reported in the left vallecula unrelated to the noted mass (Figures 1 and 2).

On preoperative evaluation, the patient was otherwise healthy, with acceptable laboratory data, electrocardiography, and echocardiography.

In the operating theater, the patient was calm, without any signs of breathlessness or stridor, with hoarseness as the only obvious symptom. The patient rejected the options of awake tracheostomy or awake fiberoptic bronchoscopy. He insisted on performing any procedure under some levels of anaesthesia.

After proper oxygenation via facemask, anaesthesia induced by the aim of inhalation of sevoflurane administered in an escalating manner. After 15 min, the cerebral state index was 40, and a regular pattern of breathing and the midline position of the pupil confirmed the optimum depth of anaesthesia. This long period was mainly due to inef-

fective spontaneous breathing secondary to a narrowed airway. The surgeon was ready to perform an emergent tracheostomy. Other alternative plans such as quick track were at hand. Then, the most expert anaesthesiologist in airway management approached intubation. The airway visualized by the videolaryngoscope, and a relatively large cyst-like mass on the left side of the vallecula was the first thing seen (Figure 3). There was a mass in the glottic area narrowing the visualized airway so that tracheal rings were not seen at all (Figure 4). As primarily planned, we introduced the smallest available cuffed microlaryngeal tube (MLT) with an internal diameter of 5 mm and an external diameter of 6.9 mm, which did not pass through the glottis, and some bleeding occurred. At this stage, the anaesthesiologist and the surgeon decided to perform tracheostomy. Since the air passage became inefficient and we were concerned about further bleeding and airway obstruction, we decided to try another tube that we know of the same size. We inserted the Fr.18 Nelaton catheter under direct laryngoscopy with an internal diameter of 4.5 mm and an external diameter of 6 mm by the aim of a Magill's forceps, which was successful. A tube connector was attached and a capnogram was placed. A proper and regular capnography waveform appeared. Arterial blood gas analysis was also in an acceptable range. Simultaneous end-tidal CO_2 of 47 and PaCO_2 of 54 mmHg on arterial blood gas analysis were recorded. The catheter was fixed using suturing and adhesive tape (Figures 5 and 6). Then, the surgeon placed a tracheostomy, and a safe airway was secured. Furthermore, the surgical approach was debulking and biopsy of the mass to plan next steps of the treatment.

Discussion

Although a handful of sophisticated devices have been introduced for difficult airway management, simple instruments could be of more advantage in expert hands (1). The Nelaton catheter is a familiar simple at-hand device for health care staff, which is also used as a suction catheter in airway management. Since it is flexible, it could be used in irregular narrowing of airway, where rigid tubes such as MLTs could not pass or could be of utility when encountering unexpected intubation in emergent situations even in less equipped centers.

Main Points:

- Difficult airway is an everyday challenge for anaesthesiologists so they must be prepared for anticipated or even unanticipated difficult airway.
- Anaesthesiologist must be skilled and be familiar with airway management devices.
- In emergent and urgent situations, any possible device could be used when the known apparatus fail to manage airway.
- Proper size of nelaton catheter could be a life saving device for patients suffering strictures and narrowing of the trachea.

Conclusion

Simple devices such as a Nelaton catheter could be used as a rescue means in difficult narrowed airways. We believe that



Figure 1. Coronal image of contrast-enhanced CT scan of the neck demonstrates mass involving right-sided true vocal cord (small arrow) and false vocal cord with supraglottic extension (long arrow) resulted in severe narrowing of the airway tract

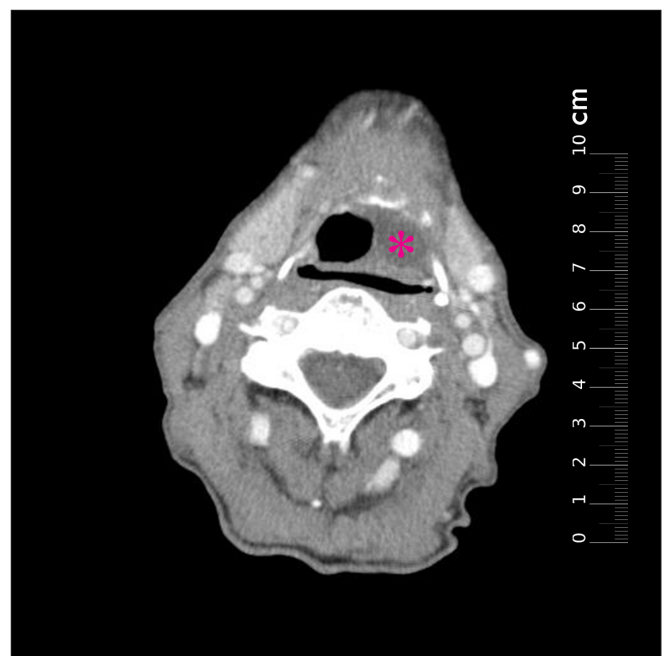


Figure 2. Axial image at the level of the hyoid bone depicts a cystic lesion occupying the left vallecula (asterisk)

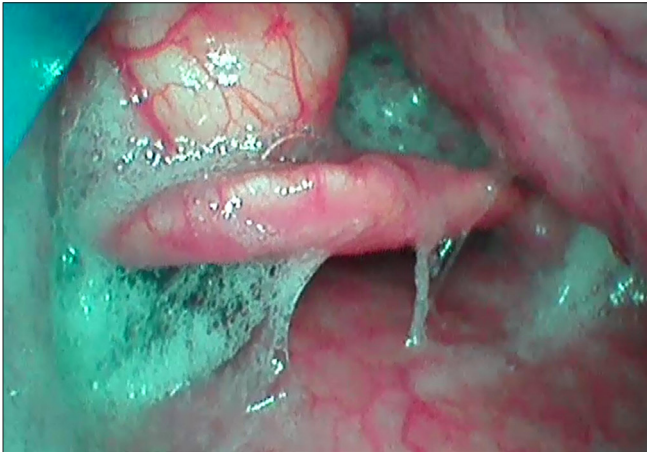


Figure 3. Cyst-like mass in the vallecula during video laryngoscopy

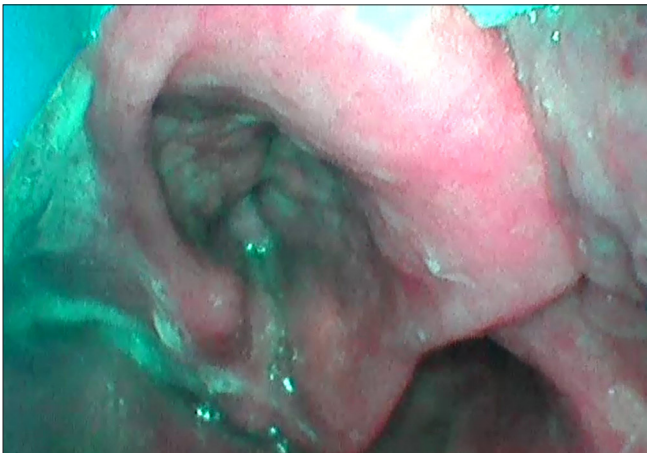


Figure 4. Different views of videolaryngoscopic observation of oropharynx. A glottic mass that obstructed airway is seen

this is the only documentation of such application for a Nelaton catheter. There are reports of other implications of a Nelaton or Foley catheter; none of them is as the airway conduit (2-4).

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – P.S., K.M.; Design – P.S., K.M.; Supervision – F.S.; Materials – K.M., P.S.; Data Collection and/or Processing – P.S., K.M.; Literature Search – K.M., P.S.; Writing Manuscript – K.M., P.S.; Critical Review – M.N., K.M., P.S., F.S.

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Figure 5. Depiction of patient with a Nelaton catheter in his airway

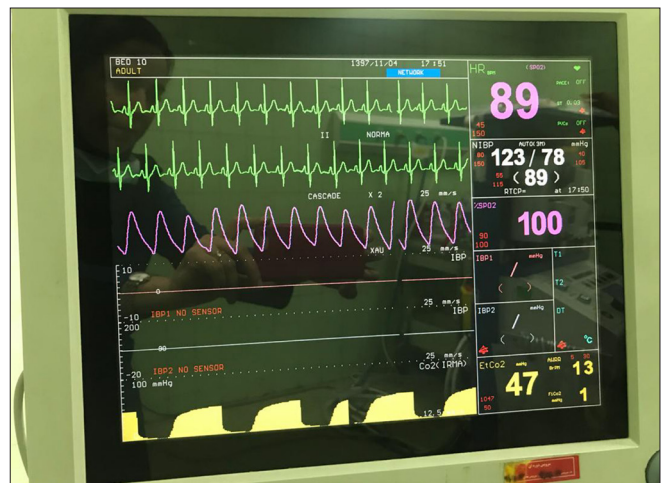


Figure 6. Depiction of patient with a concomitant capnometer

References

1. Nikhar SA, Sharma A, Ramdasally M, Gopinath R. Airway Management of Patients Undergoing Oral Cancer Surgery: A Retrospective Analysis of 156 Patients. *Turk J Anaesthesiol Reanim* 2017; 45: 108-11. [\[Crossref\]](#)
2. Abou-Madi MN, Cuadrado L, Domb B, Barnes J, Trop D. Anesthesia for tracheal resection: a new way to manage the airway. *Can Anaesth Soc J* 1979; 26: 26-8. [\[Crossref\]](#)
3. Durmus Kocaaslan N, Tuncer FB, Ayanoglu HO, Celebiler O. Nasopharyngeal Placement of a Nelaton Suction Catheter in Respiratory Monitoring of Sedated Patients. *Aesthet Surg J* 2016; 36: NP135-6. [\[Crossref\]](#)
4. Malik AM, Ahmed Z, Durgham N, Stockmann PT, Belenky WM, Zestos M. Airway and ventilation management during repair of a large acquired tracheoesophageal fistula: the novel use of a readily available tool. *J Clin Anaesth* 2012; 24: 133-6. [\[Crossref\]](#)