

C-MAC D-blade laryngoscope: A saviour for difficult intubation in lateral position

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Abstract

Video laryngoscopes are the latest addition in an anaesthesiologist's armamentarium. They are comparable to fiberoptic bronchoscope in terms of ease of visualization of vocal cords especially in awake intubation and in those with difficult airway. They have an added advantage of having an easier learning curve than fiberoptic bronchoscope guided intubation. There are several studies where video-laryngoscopes have been used in manikins and normal patients for intubation in both supine and lateral position successfully. Of these C-Mac D-Blade laryngoscope has an added advantage of having a blade like Macintosh with camera at the tip which gives good results. In our case report we describe an emergent scenario of successful awake nasal intubation in lateral position using C-Mac D-blade laryngoscope in a patient with documented difficult intubation.

Keywords: Video laryngoscope, C-Mac, D-blade, Nasal intubation, Difficult intubation

Introduction

Flexible fiberoptic intubation is the gold standard in the management of the expected difficult airway. But in an emergent scenario or when faced with an unanticipated difficult intubation, we still resort to using a conventional Macintosh laryngoscope⁽¹⁾ aided by bougie or Magill forceps. This is probably due to the ease of availability. Many anatomical and pathological factors can make direct visualization of the airway difficult. In the last decade, multiple video laryngoscopes have been introduced into clinical practice and have become more common during emergency intubations.⁽²⁾ C-Mac is recently introduced video laryngoscope that has the advantage of having a Macintosh type of laryngoscope blade with a camera at the tip. Though this device is useful for intubating in difficult airway in supine position, various studies are available which shows better results while intubating in lateral position.⁽³⁾ We report the use of C-Mac D blade laryngoscope for emergency awake intubation in a patient with established difficult airway, where the difficulty was compounded by unusual positioning of the patient.

Case Report

Patient has reviewed the case report and gave written permission for the authors to publish the report. A 60 year old, 60 kg male, tobacco chewer, diagnosed case of squamous cell carcinoma left middle ear, treated with radiotherapy and chemotherapy, was scheduled for a temporal bone resection (Fisch type B) with pectoralis major flap reconstruction. His Mallampatti grading was II and other airway indices were within normal limits. During intubation he was found to have a Cormack-Lehane (CL) grading III even after applying BURP, with a Macintosh laryngoscope. Intubation was then performed in second attempt using a C-Mac D blade video laryngoscope with a POGO of 60%. On the third

postoperative day, he had a secondary hemorrhage and was shifted to the operating room in right lateral position with a surgical resident applying compression to the bleeding site. Due to sudden rapid blood loss, the patient was in hypotension and the pulse was feeble (blood pressure 80/54 mm Hg with pulse rate of 120/min). In view of previous difficult intubation, a fiberoptic bronchoscope was asked for as we had to perform awake intubation. But the patient was deteriorating rapidly and there was no time to wait till the bronchoscope could be set up. Thus, an awake C-Mac guided oral intubation was attempted, but was not successful as negotiating the tube in limited mouth opening was difficult. The airway was finally secured by an awake nasotracheal intubation aided by the boedeker forceps (curved forceps). All this while the patient was lying in the lateral position with the compression to bleeding point continuing. Once the airway was secured, anaesthesia was administered with fentanyl, oxygen and air and surgery was allowed to proceed. The bleeding vessel was identified and ligated and haemostasis achieved. Meanwhile hemodynamic parameters were stabilised with fluid, blood transfusion and inotropes. Post operatively the patient was shifted to PACU for elective ventilation.

Discussion

Awake fiberoptic intubation remains the gold standard in the expected difficult airway. The use of video laryngoscopes such as the C Mac have increased over the past few years leading to a significant decrease in the number of awake fiberoptic intubations. Certain circumstances require an anaesthesiologist to perform endotracheal intubation in positions other than supine like lateral. These situations like trauma, accidental airway loss during surgery, neoplastic conditions of the occiput, back, or the sacral region make it either impossible or very difficult to place the patient in the

supine position for airway management. These issues are important because the consequences of inadequate airway management may be catastrophic, causing hypoxia, brain injury, and death.

Endotracheal intubation using direct laryngoscopy in the lateral position may be an unfamiliar technique, typically cumbersome, and time consuming. The laryngeal view is compromised during direct laryngoscopy and puts the anaesthesiologist in an uncomfortable position. The difficulty in performing laryngoscopy in patients lying in the right lateral position may be aggravated by the tongue, which has a tendency to slip off the laryngoscope blade due to gravity, while the blade is inserted from the right side of the tongue. Besides the deteriorated laryngeal view, limited space between the laryngoscope handle and the table top in the right-lateral position would contribute to intubation difficulty if direct laryngoscopy were attempted conventionally, by inserting the tracheal tube from the right corner of the mouth.⁽⁴⁾

Our patient already had a history of difficult-intubation with Macintosh laryngoscope, which in lateral position aggravates the situation of difficult airway. Though lateral intubation using fiberoptic bronchoscopy can be performed, but setting up the bronchoscope, light source etc. takes time. Also if the anaesthetist is not an expert with the bronchoscope, then this can prolong the duration for intubation and thus hypoxia and its consequences.

Video laryngoscopes as a tool to secure the airway are popular for several reasons. It is comparatively easy to learn using it. A study indicates that for using a video laryngoscope, you need to be able to perform at least 3 intubations to have a success rate of 81%.⁽⁵⁾

With the C-MAC video laryngoscope, intubation is much easier in the lateral position than with a conventional laryngoscope. As the camera (CMOS) is located at the distal tip of the blade, a direct line of sight between the eyes and the glottis is not required. The D blade is specifically designed for the difficult airway. It can be used in both anaesthetised and awake patients. With its flat profile and elliptically shaped blade, the D blade can be glided along the tongue to guide the user directly to the epiglottis. Particularly when it comes to difficult intubation CL III and IV, the D blade enables successful intubation. With a low blade height of 12 mm it can also be used for patients with minimal mouth opening. Bhat et al, had observed that in ASA 1 and 2 patients with normal airway, the ease of intubation in the lateral position with C-MAC is better than with conventional Macintosh laryngoscope.⁽⁶⁾ In an another study by the same authors, intubation in right and left lateral position was compared and no significant difference observed in the ease of intubation or the time taken for intubation.⁽⁷⁾ But both these studies were in patients with normal airway. It has been observed that in order to be able to intubate with a

video laryngoscope in an emergent situation one must have sufficient practice in patients with normal airway.

Although LMA and other supraglottic devices are essential tools and may prove lifesaving in difficult airway situation but they still fall short of the gold standard of a secure airway. Intubating LMA may help, but visual confirmation is not possible, it might not be possible to pass a larger size ETT through it, and chances of displacement are higher. In our patient, the site of surgery being in proximity to the airway could lead to accidental malpositioning of the supraglottic device during surgery.⁽⁸⁾

The 2015 DAS⁽⁹⁾ guidelines for difficult intubation in the unanticipated difficult airway have included video laryngoscope in the plan A. An oral endotracheal intubation using the D Blade requires the tube to be moulded in the shape of the blade using the stilet whereas nasotracheal intubation doesn't require any such preparation as the nasopharyngeal axis is closely aligned to the laryngeal axis.

An awake fiberoptic intubation can be performed in different patient position including lateral, reclining without much difficulty. The other alternatives to secure a difficult airway are railroading over a bougie, Percutaneous tracheostomy or open tracheostomy. In all these, patient preparation and equipment setup require some time. In an emergent situation like the one we encountered each second was precious and timely securing of airway using C-Mac D blade helped in saving the patient.

Conclusion

Video-laryngoscopes like the C-MAC are useful airway adjunct. In situations where awake oral intubation is difficult due to a thick tongue or restricted mouth opening, a nasal route for intubation is preferable as the endotracheal tube follows an easier axis than an oral intubation. A nasal intubation also has the advantage of not requiring moulding the tube. With the help of the boedeker forceps the ET tube can be guided to the laryngeal aperture. One must always keep their priority of using videolaryngoscope (C -Mac) in case of emergency lateral intubations.

Consent

Written informed consent was obtained from the patient for publication of this case report.

Conflict of Interests

The authors declare that they have no conflict of interests related to this manuscript.

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