

Feasibility of McGrath® Video Laryngoscope for Awake Laryngoscopy and Intubation

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Abstract

Difficult and failed intubations, although rarely encountered, are major causes of morbidity and mortality in the current anesthetic practice. To reduce the incidence of difficult and failed intubations, several devices including the recently developed video laryngoscopes are available. In this paper, we evaluated the role of newly developed McGrath® video laryngoscope in a case of postburn contracture neck, with limited neck extension and mouth opening. Anticipating difficulty in securing airway with conventional laryngoscopy, we hereby successfully used the McGrath® video laryngoscope to secure the airway. The quality of laryngoscopy and intubation showed that this portable device can be very helpful in difficult airway management.

Key words: Awake intubation, McGrath®, postburn contracture, video laryngoscope

INTRODUCTION

Airway management is an essential skill for anesthetist. Although major airway complications during anesthesia are rare, the adverse consequences can be serious.^[1] Death or permanent brain damage, resulting from difficult tracheal intubation and esophageal intubation, accounted for more than one-third of adverse respiratory events in the American Society of Anesthesiologists (ASA) closed claims study.^[2] Direct laryngoscopy using the Macintosh laryngoscope is the most widely used technique for tracheal intubation; however, this skill is difficult to acquire.^[3-5] Video laryngoscopy is now a widely accepted technique of airway management that may be easier for novice and inexperienced practitioners to learn.^[6] However, it should be introduced early in the training of young anesthetists.^[7] The McGrath® video laryngoscope (Aircraft Medical, Edinburgh, Scotland) is a novel, portable, lightweight unit with a disposable angulated acrylic blade that provides excellent laryngoscopic views in patients with normal airways or in patients whom direct laryngoscopy has been difficult or has failed [Figure 1].^[8,9] Herein, we describe a case of a postburn contracture neck with limited neck extension and mouth opening that was successfully intubated using McGrath® video laryngoscope.

CASE REPORT

A 20-year-old female, weighing 50 kg, ASA Class I, came to the outpatient department with the complaints of postburn contracture anterior neck [Figure 2]. Patient has a history of burn 1 year back and now developed severe postburn contracture in the neck. She was Mallampati Grade IV with hardly two fingers of mouth opening, flexion of the neck was 25–30° while the extension was just 15–20°. Routine investigation, serum electrolytes, and electrocardiography were normal. Following this, she was posted for contracture release and split-thickness skin graft. A preoperative anticipation of difficult intubation was made, and difficult airway cart was kept ready. Awake intubation using the McGrath® video laryngoscope was planned after obtaining written informed consent. Standard monitoring devices were attached along with continuous oxygen insufflation via a nasal cannula. Following nebulization and gargle with 4% lignocaine, 10% lignocaine was sprayed on the posterior aspect of tongue and pharynx.

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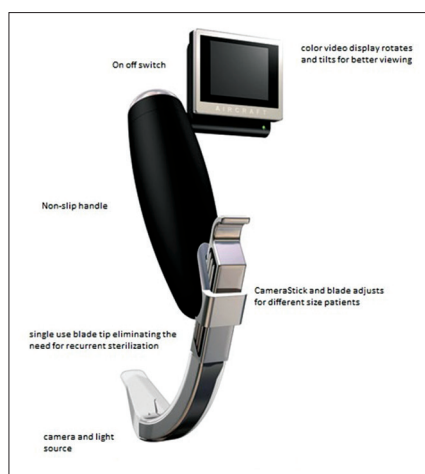


Figure 1: McGrath® video laryngoscope



Figure 2: Limited mouth opening and neck extension

Intravenous (i.v.) glycopyrrolate 0.2 mg and i.v. midazolam 1.5 mg were administered. Fentanyl in a dose of 1 µg/kg was given along with titrated doses of propofol. Verbal contact was maintained throughout the procedure. Laryngoscopy performed with minimal force and the only slight extension possible showed a Cormack and Lehane Grade II view. Lignocaine 10% was sprayed on the vocal cord and a 7.0 mm cuffed endotracheal tube (ETT) was passed over a malleable stylet. There were no complications such as desaturation, coughing, or trauma. Once end-tidal carbon dioxide and bilateral breath sounds confirmed the placement, the ETT was secured in place. The patient received 100 mg of propofol for the induction followed by non depolarizing muscle relaxant (NDMR), and the surgery was allowed to proceed without any complications. Following recovery, she was interviewed to assess his tolerance to the awake video laryngoscope intubation. The patient did not report any unpleasant event during the procedure.

DISCUSSION

Conventional laryngoscopy requires sniffing position with an extension at the atlanto-occipital joint and flexion at the cervical joint to align the three axis, i.e. oral, pharyngeal, and laryngeal axes. In patients with restricted neck movements, inability to position, and align the three axis makes the airway management difficult task.

Although awake fiberoptic intubation is the gold standard for a difficult airway but it requires practice and may not be possible to routinely use in some clinical settings. Lack of expertise with fiberoptic intubation along with the acquaintance of direct laryngoscopy leads to continued use of direct laryngoscopy as the second choice for difficult airway management. The main drawbacks of flexible fiberoptic endoscopy for intubation are the steep learning curve and the increased time to intubation as compared with direct laryngoscopy. The advantage of video laryngoscopy over fiberoptic endoscopy is because of easier learning and usage owing to its similarity to the conventional Macintosh laryngoscopy.^[3] Shorter time of intubation is

another important advantage considering the difficult airway situations.^[10] Most video laryngoscopes are portable and fast to set up making it an excellent tool for out of hospital difficult airway situations.^[11] Application of supplemental oxygen via a nasal cannula is much easier than fiberoptic endoscopy. Moreover, the presence of a camera at the distal end provides a larger field of vision without the requirement of aligning the oral-pharyngeal-laryngeal axes. The two curve theory better explains the minimal airway and cervical manipulation with the use of video laryngoscope.^[12] The slimmer blade of McGrath® causes less dental damage and can be used in patients with limited mouth opening. Its curvature allows gentle lifting of the anatomy to clear an optimum tube path without undue complications. Its feature of a variable length blade allows intubation on a variety of patients from children to large adults with the same blade. Further, the use of disposable plastic blades may prove an added advantage over other single use video laryngoscopes. These advantages of McGrath may be beneficial especially in cases of difficult airways or unstable cervical spines requiring awake intubations. It has been successfully used in cases of severe ankylosing spondylitis, significant tongue and supraglottic edema, upper airway malignancy, and for evaluation of the airway.^[13] Cooper, who has been using video laryngoscopes, wrote that “this technique potentially challenges the prevailing wisdom that such patients must be managed by awake fiberoptic intubation.”^[14] These features surely make McGrath take a lead over other video laryngoscopes in cases of limited mouth opening. Its efficacy in successfully handling the difficult airway has been explored in the literature.^[15,16] Experience shows that it may improve Cormack–Lehane by Grade 1 or 2 in a high percentage of patients maintaining a high intubation success rate.

Currently, there is little literature available to suggest the superiority of fiberoptic intubation over video laryngoscope in awake intubation. The high success rate of video laryngoscopes in patients with potential difficult airway or as a rescue device after failed intubation provides the opportunity for video laryngoscopes to have an expanded role in awake intubation

scenarios, especially if the airway manager is a novice. Further, its portability and cost effectiveness may pave the way for its introduction in emergency and out of hospital settings. Nevertheless, it will be too early to assume that video laryngoscope will replace fiberoptic bronchoscopy, but it has the potential to do so in the near future, and further studies are necessary.

CONCLUSION

Operators expertise and patient cooperation are requisite for a successful intubation in video laryngoscopy. McGrath® seems to be able to facilitate successful awake intubation very well in cases of limited neck extension.

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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