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Role of McGrath® MAC Video Laryngoscope in Ankylosing Spondylitis

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Abstract

One of the hurdles faced by an anaesthesiologist in a patient with ankylosing spondylitis (AS) is "The Airway ". Awake fiberoptic intubation is the gold standard in such cases. We report two cases of AS where intubation was done successfully with a McGrath® MAC video laryngoscope under full muscle relaxation. Provided other predictors of difficult intubation are normal, we believe that patients with severe AS can be successfully intubated using video laryngoscope (VL).

Keywords: Difficult airway, ankylosing spondylitis, video laryngoscope

Introduction

Ankylosing spondylitis (AS) is characterized by progressive ossification of the spine and other joints .[1],[2]Potential difficult airway is one of the challenges while anaesthetizing a patient with AS. The McGrath® MAC video laryngoscope is designed to assist tracheal intubation for patients with difficult airway. We describe two cases of successful intubation with McGrath® MAC video laryngoscope in patients with AS.

Case 1

Middlle aged male patient, diagnosed with diffuse carcinoma of the stomach reaching up to the gastro oesophageal (GE) junction was posted for gastrectomy + Roux-en-Y anastomosis + feeding jejunostomy.

He was a known case of ankylosing spondylitis. Pre-anaesthetic evaluation revealed severe restriction of neck extension. However, mouth opening, Mallampati classification (class 3) and thyromental distance was normal. He had difficulty lying supine without a high pillow under his head. He had no comorbidities and his investigations were within normal limits. He was a case of anticipated difficult airway because of decreased cervical mobility (**Figure 1**).

Figure 1: (a) Mallampati classification 3 and thyromental distance, inter incisor gap was normal **(b)** Severe restriction of neck extension

Written and informed consent was taken for General Anaesthesia (GA) and bilateral continuous erector spinae block. Patient was briefed about the possibility of awake intubation with fibre optic bronchoscope under airway blocks and about video laryngoscope assisted intubation under GA. Preoperative oral medications included ondansetron (4 mg), pantoprazole (40 mg) and alprazolam (0.25 mg), given the night before and on the morning of surgery.

Case 2

Another middle aged male patient a known case of AS since decades, was posted for laparoscopic distal pancreatectomy for neuroendocrine tumour. He had no history of any other significant illness in the past. His investigations were within normal limits. His mouth opening, Mallampati classification and thyromental distance were normal. However, neck movements were severely restricted. Hence, a difficult airway was anticipated. Weplanned for video laryngoscope assisted intubation under GA. Consent for emergency invasive airway management, in case of failure to intubate or ventilate situation, was also taken. Anaesthetic induction technique.

Operating room was prepared with emergency airway cart consisting of fibreoptic bronchoscope, McGrath® MAC video laryngoscope, Laryngeal mask airway (LMA)of size 3, 4 and 5, oropharyngeal and nasopharyngeal airways, gum elastic bougie, cricothyroidotomy set and endotracheal tubes of various sizes. Patients were positioned supine with pillows under their head. Standard monitoring including ECG, pulse oximeter

and non-invasive blood pressure were applied. An 18-gauge intravenous cannula was inserted, 500 ml of ringer lactate was started. Under local anaesthesia radial artery was cannulated with 20g Insyte and the arterial blood pressures were transduced.

Keeping FOB standby, patients was given injection glycopyrrolate 0.2 mg IV, fentanyl 2-3 mcg/kg, midazolam 0.5 mg/kg, propofol 2 mg/kg. After confirming the ventilation, succinylcholine 1.5-2mg/kg was given. Intubation was attempted with McGrath® MAC video laryngoscope, vocal cords were visualised. Bougie (Cook Frova intubating introducer 14F 4.6 mm, 70 cm) was introduced under vision, 8 sized cuffed endotracheal tube(ETT) railroaded over the bougie (**Figure 2**). Air entry was checked and placement confirmed with end tidal carbon dioxide ($ETCO_2$) and tube fixed.

Figure 2: Cormack-Lehane Class 1 with McGrath® MAC Video laryngoscope. Bougie (Cook Frova intubating introducer 14F 4.6 mm, 70 cm) was introduced under vision, 8 sized cuffed endotracheal tube (ETT) railroaded over the bougie

Discussion

Ankylosing spondylitis is characterized by ossification of the spinal column resulting in stiffness. Decreased or no cervical spine mobility, fixed flexion deformity of thoracolumbar spine and possible temporomandibular joint disease are all associated findings in a patient with ankylosing spondylitis. This carries the risk of failed intubation and cervical spine injury necessitating the need for awake fibreoptic intubation [1,2]. With the progression of

AS, adequate laryngoscope view may not be possible with a conventional Macintosh direct laryngoscope [3]. Various other approaches are available for securing the airway in patients with AS, including blind nasal intubation, lighted stylet intubation, Bullard laryngoscopy, retrograde intubation, intubating laryngeal mask airway, Aintree Intubation Catheter and tracheostomy [1,2,4].

The advent of Video laryngoscopes (VLs) has been a relief for the anaesthetist facing a potential difficult airway [4,5]. The McGrath® MAC VL is a reusable video laryngoscope with a light source and a digital video camera at the tip of the laryngoscope blade. VL offers the advantage of visualization of glottic structures on a small monitor without the necessity of direct alignment of the optical axis [3]. The McGrath® MAC VL blade retains the same shape and curvature of the Macintosh blade. This curvature provides provides the necessary space for control of the trajectory of the endotracheal tube. A clear image of glottis on the screen helps in easy placement [6].

The learning curve is brief, and the technique is easily acquired [6,7]. Adequate laryngeal exposure was obtained in both our patients and successful intubation could be achieved at first attempt in both cases. However, passage of the endotracheal tube (ETT) may be difficult despite a good glottic view and a pre-shaped stylet may be required. Cooks bougie was used as a guide to introduce the endotracheal tube. Fogging and secretions may obscure the view. Warming the blade of the McGrath® MAC VL in the hot air warmers helped prevent the fogging and offering a good view while intubating.

Glidescope (GS) is the frequently used VL for intubating patients with AS [3,5]. In a study of 60 patients with ankylosing spondylitis, nasotracheal intubation using the Glidescope (VL) was easier when compared to conventional intubation with Macintosh laryngoscope [3]. This study demonstrated that, with the addition of the GS, AS patients deemed to have a difficult intubation with the Macintosh laryngoscope can be intubated safely under GA. However eight patients could not be intubated by GS. These were patients with MP score of 3 or 4, decreased inter incisor gap of <3 cm, thyromental distance of <6.5 cm. These findings demonstrate the video assisted laryngoscope has its limitations and fibreoptic techniques still have a role in managing the severe AS. Another limitation of GS use is in patients with limited mouth opening [7].

McGrath® MAC VL has been reported for awake tracheal intubation in a patient with severe ankylosing spondylitis under local airway block [8]. Emergency intubation of an AS patient in lateral position was made possible using a Glidescope [9].

Conclusion

Choice of difficult airway equipment should be based on the underlying pathophysiology of the patient and the experience of the clinician. Provided other predictors of difficult intubation are normal, we believe that patients with severe AS can be successfully intubated using VL. This challenges the popular thought that all patients with AS should intubated with an FOB.

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