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Awake Orotracheal Intubation with the McGrath Mac X-Blade in a Patient with Expected Difficult Airway

Zehra İpek ARSLAN[a],
Georgi Stefanov ZAYAKOV[a]

[a]Department of Anesthesiology and Reanimation,
Kocaeli University Faculty of Medicine,
Kocaeli, TURKEY

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Correspondence:
Zehra İpek ARSLAN
Kocaeli University Faculty of Medicine,
Department of Anesthesiology and Reanimation,
Kocaeli, TURKEY
zehraipek48@gmail.com

ABSTRACT We managed a 25 year-old male undergoing laparoscopic abdominal testis exploration using awake McGrath MAC X-Blade videolaryngoscopy. He had Mallampati IV (with phonation), macroglossia, mandibular protrusion B, no ability for jaw thrust maneuver, limited head flexion and a wing scapula. Cardiac arrest had occurred during his previous surgery related to his impossible mask ventilation. The oropharynx was topicalized with a 10% lidocaine spray. Three ml of 2% lidocaine was administered from the cricothyroid membrane. A continuous remifentanil infusion was started at the same time. The patient was intubated successfully with a McGrath MAC X-Blade at the first attempt and with a stylet inserted into a standard polyvinylchloride endotracheal tube under cricoid pressure with a Cormack-Lehane grade 2a and minimal gag reflex. He was transferred to the intensive care unit with an airway exchange catheter in place. He was discharged in good condition into his service the day after surgery.

Keywords: Awake intubation; difficult; video laryngoscope; McGrath MAC; X-Blade; expected

The McGrath MAC (Medtronic Medical; Minneapolis, USA) is a portable videolaryngoscope with a slim designed X-Blade to improve difficult intubation situations without occupying much space. Its effectiveness in failed direct laryngoscopy in patients with limited mouth opening under general anaesthesia was demonstrated previously with case reports.[1,2] However, its performance in awake oro-tracheal intubation has not been validated. We have documented a successful awake orotracheal intubation in a truly difficult intubation who had cardiac arrests during his previous two operations under general anesthesia.

CASE REPORT

We have documented a successful awake intubation with the McGrath MAC X-Blade (Figure 1) in a patient with an expected difficult airway with a history of two cardiac arrests due to hypoxia during the previous two operations in a private hospital. His anesthesiologist reported that the patient had no hypoxia tolerance. The patient was also working as a member of the medical team. His preoperative visit in our hospital revealed that; he was a 25-year-old male patient with a weight of 58 kg and a height of 168 cm. He was undergoing laparoscopic abdominal testis exploration. He had Klinefelter disease (chromosomal condition) and growth disorder. He had no his-

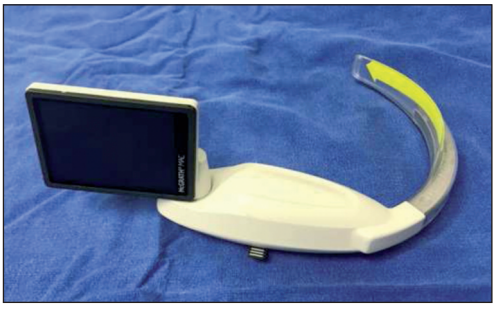

FIGURE 1: The McGrath MAC videolaryngoscope with its slim X-Blade.

tory of medications, allergies or smoking. His airway evaluation revealed that he had macroglossia, mandibular protusion B, Mallampati IV (even with phonation) and had limited head-neck flexion due to his wing scapula with an inter-incisor distance of 3 cm (Figure 2). He had no temporomandibular joint movement so he did not have jaw thrust maneuver ability. His head extension was normal. His sternomental distance was 12 cm and thyromental distance was 6 cm. Neck circumference was 36 cm. His tooth morphology was full. He had no history of snoring. Written informed consent was obtained from the patient for all aspects of the complications and the possible publication of this particular case. We prepared the patient for awake intubation. We decided to apply awake videolaryngocope intubation with a slim McGrath MAC X-Blade rather than an awake fiberoptic intubation. After inserting a 20-gauge intravenous line, midazolam 0.05 mg/kg was administered and then he was transferred to the operating theatre. We anesthetized the oropharynx with 10% lidocaine spray and waited for approximately 5 minutes. Standard ECG monitoring, heart rate, pulse oximetry, capnograph and noninvasive blood pressure at every 5 minutes were applied. We examined the trachea with a McGrath MAC X-Blade and we had a Cormack-Lehane grade 2b. The patient was pre-oxygenated with tidal volume breathing 7 ml / minutes (min) oxygen using a facemask 3-5 minutes until the end-tidal oxygen concentration reached above 90%. We inserted a 20-gauge intravenous (iv) cannula through the cricothyroid membrane and then took out the needle leaving the plastic cannula in place and transtracheal 3 ml 2% lidocaine was administered at the same time when we started a continuous infusion of remifentanyl 0.05 mgr/kg/min and then waited for 5 minutes. An expert anesthetist attempted to intubate the trachea with a McGrath MAC X-Blade with minimal gag reflex and we had a Cormack-Lehane grade 2b. Then we applied cricoid pressure and we had a Cormack-Lehane grade 2a. We inserted a stylet into the 7.0 mm inner diameter tube before attempting to intubate. We inserted the tube into the trachea with the first attempt and checked it with the capnography as well. No desaturation occurred during the entire procedure. Anesthesia induction was achieved with 3 mg/kg propofol, 1 mgr/kg fentanyl iv and muscle relaxation with 0.3 mg/kg rocuronium iv. Anesthesia was maintained with sevoflurane in a mixture of nitrous oxide and oxygen and a continuous remifentanyl infusion iv. We administered prednisolone 1 mg/kg and ranitidine 1 mg/kg iv to decrease edema formation. Neuromuscular blockage was reversed with 2 mg/kg sugammadex iv (Bridion®; Merck Sharp & Dohme Ltd., Hertfordshire, UK). The patient was extubated using a Cook airway exchange catheter which was left in place and was transferred to the intensive care unit for close follow-up. He was transferred to the ward the next day after the surgery.

FIGURE 2: Maximum head flexion due to his wing scapula.

DISCUSSION

Awake flexible fiberoptic intubation is the gold standard method for the management of expected difficult airways. However, it is very complex, expensive, it requires a skilled technician and ongoing training. Inserting the tube into the trachea is a blind process and can be harmful.[3]

In addition, the Fourth National Audit Project of the Royal College of Anaesthetists (NAP4) reported that awake fiberoptic intubation was not used as the primary airway plan for many high-risk patients and that it failed for a variety of reasons such as; airway obstruction, lack-of patient cooperation, secretions, blood and difficulty recognizing airway anatomy. Orotrcaheal fiberoptic intubation always requires jaw thrust maneuver and insertion of Berman or Ovassapian airway.[4] Inserting an airway will increase the risk of the gag reflex. Our patient had no movement for a jaw thrust maneuver, so oral fiberoptic would probably be difficult. Another option for this patient was nasotracheal intubation which has some complications as well.

A Cochrane database concluded that failed intubations were significantly fewer when videolaryngoscopy was used in patients with an anticipated difficult airway.[5] In our clinic, the need for fiberoptic intubation dramatically decreased after using the videolaryngoscopy in expected difficult airways.

There are some original articles comparing awake intubation with angulated or channeled videolaryngoscopes and flexible fiberoptic intubation. They demonstrate that videolaryngoscopy is comparable or superior regarding the time needed for successful intubation and the success ratio of fiberoptic intubations. Even in some of them, the patient's comfort was comparable or better in the videolaryngoscopy group compared to fiberoptic group.[6,7]

In addition there are some case reports about awake intubation with a videolaryngoscope after failed fiberoptic intubation in a morbidly obese patient with a massive thyroid tumor and tracheal compression.[8] Another case report demonstrated that awake videolaryngoscope intubation was possible after failed fiberoptic intubation in a patient with Madelung disease and critical airway obstruction.[9]

Consistently with ours, all studies that compared the awake fiberoptic bronchoscopy and videolaryngocpy used a remifentanil infusion with midazolam. We used the transtracheal injection and the 10% lidocaine spray technique together.[8]

Our previously published case report encouraged us to look at the Cormack-Lehane grade with a McGrath MAC X-blade without much discomfort to our patient after administration of a 10% lidocaine spray.[2] Starting from this point, we hypothesized that the use of the slim X-Blade could be suitable to minimize the gag reflex, allowing direct visualization. This could be another advantage in avoiding palatal or pharyngeal injuries.[6,10]

Uslu and colleagues showed that awake tracheal intubation of a patient with severe ankylosing spondylitis using a McGrath MAC X-Blade is easy.[11] McGuire demonstrated 3 difficult airway cases performed with an awake McGrath video laryngoscopy after failed fiberoptic intubation.[12] The X-Blade is the new thin blade that could be easier to tolerate.

Therefore after reviewing the revised Difficult Airway Society (DAS) guidelines; Marshall and Pandit suggested that if it is essential to increase the first attempt success rate the videolaryngoscopes should become the first-line agents in most tracheal intubations.[13] They posed the following question "What should be the role of videolaryngoscopes in anticipated difficult airways? As such, we need a new guideline for the anticipated difficult airway".[14]

In conclusion, anesthesiologists need simple awake intubation methods such as videolaryngoscopic intubation during which the whole procedure could be monitored, even the tube insertion. It is due time to try awake intubation with videolaryngoscopy as the primary technique for an anticipated difficult airway.[15]

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Zehra İpek Arslan;* ***Design:*** *Zehra İpek Arslan, Georgi Stefanov Zayakov;****Control/Supervision:*** *Zehra İpek Arslan;* ***Data Collection and/or Processing:*** *Zehra İpek Arslan, Georgi Stefanov Zayakov;* ***Analysis and/or Interpretation:*** *Zehra İpek Arslan, Georgi Stefanov Zayakov;* ***Literature Review:*** *Zehra İpek Arslan, Georgi Stefanov Zayakov;****Writing the Article:*** *Zehra İpek Arslan, Georgi Stefanov Zayakov;****Critical Review:*** *Zehra İpek Arslan;****References and Fundings:*** *Zehra İpek Arslan, Georgi Stefanov Zayakov;* ***Materials:*** *Zehra İpek Arslan.*

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