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, those patients with limited mouth opening under general anaesthesia which was demonstrated previously with case reports. However, its performance in awake oro-tracheal intubation has not been validated. We have documented a successful awake oro-tracheal 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 special hospital. His anesthesiologist said that, the patient had no hypoxia tolerance. The patient was also working as a member of the medical staff. His preoperative visit at our hospital revealed that; he was 25 years of age, of male gender, with a weight of 58 kg and a height of 168 cm. He was undergoing laparoscopic abdominal testis exploration. He has Klinefelter disease (chromosomal condition) and growth disorder. He was not tak-
ing any medications, and had no history of allergies or smoking. His airway evaluation revealed that he had macroglossia, mandibular protrusion B, Mallampati IV (even with phonation) and had limited head-neck flexion according 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 and with a thyromental distance of 6 cm. Neck circumference was 36 cm. His tooth morphology was full. He had no history of snoring. Written informed patient consent was obtained from the patient according to all aspects of the complications and the possible publication of this particular case. We prepared for awake intubation. We decided to apply awake videolaryngoscope 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 to the patient 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 every 5 minutes was 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 insert 20-gauge intravenous (iv) cannula through the cricothyroid membran and then took out the needle leaving the plastic cannula in place and transtracheal 3 ml 2% lidocaine was administered while at the same time 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 induced 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. Neuro-muscular blockage was reversed with 2 mg/kg sugammadex iv (BridionO; Merck Sharp & Dohme Ltd., Hertforshire, UK). The patient was extubated using a Cook airway exchange catheter was left in

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

**FIGURE 2:** His maximum head flexion picture because of his wing scapula.
place and was transferred to the intensive care unit for close follow-up. He was discharged the next day after the surgery into his own service.

**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. Orotroacheal 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 have been difficult. Another way to intubate this patient was nasotracheally. Nasotracheal intubation 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 written 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 published case report demonstrated that awake videolaryngoscope intubation was possible after failed fiberoptic intubation in a patient with Madelung disease and critical airway obstruction.⁹

Consistent with ours, all studies that compared the awake fiberoptic bronchoscopy and videolaryngoscopy 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. Starting from this point, we hypothesize 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 videolaryngoscopy 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.

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