

Advantages Of The Airtraq Laryngoscope

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Abstract

Possibly the most daunting task faced by critical care medical personnel are emergency intubations. Often times you are presented with a patient you are unfamiliar with who needs to be intubated in order to increase their chances of survival. In an attempt to cut costs many rural hospitals staff their emergency rooms with personnel whose intubation skills may be marginal at best and an experienced anesthetist may be unavailable. In order to allow ourselves every advantage in critical situations we must evaluate any device that may afford a greater chance of success at a reasonable cost. The Airtraq laryngoscope appears to be such a device. The Airtraq is known as an indirect laryngoscope, meaning that a view of the glottis is obtained by looking into a viewfinder rather than by direct observation such as with a traditional Macintosh or Miller laryngoscope blade. The Macintosh laryngoscope is the accepted standard device for intubation and numerous studies have been undertaken to compare the Airtraq laryngoscope to it. In this paper I will examine evidence that the Airtraq laryngoscope has been found to be superior to the Macintosh laryngoscope in many scenarios.

INTRODUCTION

Possibly the most daunting task faced by critical care medical personnel are emergency intubations. Often times you are presented with a patient you are unfamiliar with who needs to be intubated in order to increase their chances of survival. In an attempt to cut costs many rural hospitals staff their emergency rooms with personnel whose intubation skills may be marginal at best and an experienced anesthetist may be unavailable. In order to allow ourselves every advantage in critical situations we must evaluate any device that may afford a greater chance of success at a reasonable cost. The Airtraq laryngoscope appears to be such a device.

RESEARCH QUESTION

The proposed research question would be is the Airtraq laryngoscope superior to the Macintosh laryngoscope in any circumstances and if so what would these circumstances be?

REVIEW OF LITERATURE

The Airtraq (Prodol Meditec S. A., Vizcaya, Spain) disposable laryngoscope was designed to provide a clear view of the glottis without altering the normal alignment of the oropharyngeal axes (Dhonneur, Ndoko, Amathieu, Housseini, Polliand, and Tual, 2007). As a result of an exaggerated blade curvature an internal arrangement of optical lenses and a mechanism to prevent fogging of the distal lens, a high quality view of the glottis is provided. The

blade of the Airtraq laryngoscope consists of two side by side channels. One channel contains a system of mirrors and lenses that transfers the image from the illuminated tip to the viewfinder the other channel acts as a conduit through which the tracheal tube can be passed (Maharaj, Costello, McDonnell, Harte and Laffey, 2007c).

Numerous studies indicate that the Airtraq laryngoscope is superior to the Macintosh in regard to the time spent learning and the retention of those skills necessary for successful intubation. A study of novice users comparing the Airtraq to four similar devices found that only the Airtraq was less difficult and they were more comfortable using it compared to the Macintosh laryngoscope (Maharaj, et al, 2007d). A study involving ambulance personnel without previous intubation training indicated a high first time intubation success rate when managing the airway model of a grade III/IV difficult intubation with an Airtraq laryngoscope (Wolland, Mannion, Lighton, Johns, O'Meara, Cotton and Smyth, 2007). In 2006 Maharaj et al found that the Airtraq device showed a rapid learning curve and the medical students involved in the study found it significantly easier to use than conventional direct laryngoscopy.

Studies indicate that among experienced personnel the Airtraq is a superior tool. Two consecutive randomized, cross over trials comparing intubation success rates in third year paramedic students and experienced pre hospital

practitioners using the Airtraq and the Macintosh laryngoscopes on a manikin model of difficult intubation found increased first time intubation success rates and had lower rates of esophageal intubation with the Airtraq compared with the standard Macintosh (Woolland, Lighton, Watt, McCrea, Johns, Hamilton, O'Meara, Cotton and Smyth, 2008). A 2005 study of experienced anesthetists showed that in the simulated difficult laryngoscopy scenario the Airtraq was more successful in achieving intubation, required less time to intubate successfully, caused less dental trauma and was considered by the anesthetists to be easier to use than the Macintosh laryngoscope (Maharaj, et al , 2006b).

Retention of infrequently used skills can be a problem even for properly trained personnel. A 2006 study found that personnel that may be required to perform tracheal intubation on an infrequent basis may have greater retention of skills with the Airtraq compared to the Macintosh laryngoscope (Maharaj, et al, 2007b)

When comparing the Airtraq to the Macintosh laryngoscope for use with patients deemed at risk for difficult intubation the Airtraq reduced the number of intubation attempts, the need for additional maneuvers and reduced the degree of hemodynamic stimulation and minor trauma compared to the Macintosh laryngoscope (Maharaj, et al, 2008). The Airtraq has also been evaluated for use in morbidly obese patients. When a modified insertion technique was used the results were positive. The recommended insertion procedure with this type of patient involves the rotation of the Airtraq one hundred eighty degrees before insertion and once in place, rotated to the conventional pharyngeal position. This maneuver reduced intubation time and reduced the occurrence of upper airway trauma (Dhonneur, Ndoko, Amarthieu, Attias, Housseini, Pollard and Tual, 2007).

As mentioned previously the Airtraq laryngoscope does not require alignment of the oropharyngeal axes to obtain a view of the glottis. This is a distinct advantage over the Macintosh laryngoscope when used on a patient with cervical spine injuries. In a study of patients with cervical spine immobilization the Airtraq provided superior intubation conditions, resulting in reduced attempts to successfully intubate and reduced stimulation of heart rate and blood pressure in comparison with the Macintosh laryngoscope (Maharaj, et al, 2007a).

DISCUSSION

The bulk of research pertaining to the Airtraq laryngoscope

has been performed at the Galway University Hospital, Galway, Ireland under the direction of Dr. C. H. Maharaj. Additional studies at the Jean Verdier Public University Hospital of Paris, Paris, France have built on these studies. All of the research presently available reflects favorably on the Airtraq device when compared to the Macintosh. All literature cited in this paper denies any conflict of interest concerning the Airtraq laryngoscope.

RESEARCH QUESTION RELEVANCE

The first time I saw an emergency intubation a small child had coded in the PICU and was being intubated by a well educated and experienced anesthetist. After several attempts, a lot of blood, suctioning and two broken incisors the intubation was successful. At this time it occurred to me that a medical instrument which resembled something that would be used to pry the hubcap from a car was the device of choice to perform this delicate maneuver. If there is another device available that performs superiorly to the Macintosh laryngoscope we are compelled to evaluate this device for the sake of our patients and our own peace of mind.

CONCLUSIONS

As medical professionals we are taught that maintaining the airway is first priority in any life threatening event. Research cited previously indicates that the Airtraq laryngoscope is a step forward in airway management. The studies cited in this paper indicate that the Airtraq laryngoscope is superior to the Macintosh in every situation evaluated and was deemed easier to use by all personnel used in these evaluations. The advantage provided by the Airtraq lies in its' ability to provide a clear view of the glottis without alignment of the oropharyngeal axes. This feature alone would make it invaluable when treating a patient with cervical spine injuries.

At a cost of around eighty dollars for a single use disposable device this would seem to be a small price to pay for the advantages offered. When the cost of maintaining a reusable laryngoscope, sterilization of blades and the inherent infection control issues are considered the cost of the Airtraq laryngoscope becomes less of an issue.

RECOMMENDATIONS

The Airtraq laryngoscope is a device which should be made available to all departments and or entities where intubations may be preformed. This device has proven to be superior to other known devices of this type and would afford better results by a variety of users with a wide range of experience.

I have no relationship with the manufacturer and have received no compensation from them.

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