Emergency use of the Airtraq laryngoscope in traumatic asphyxia: case report

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This case report describes the emergency use of a novel, single-use, anatomically shaped laryngoscope that has recently become commercially available in the UK (Airtraq, Prodol Meditec, Spain). It was used to successfully intubate a severely injured 41-year-old patient who had sustained traumatic asphyxia after attempting suicide by hanging. He was bleeding into his upper airway, necessitating regular suctioning. The patient underwent an emergency rapid sequence intubation at the scene of injury, with in-line immobilisation and cricoid pressure while lying on the ground in bright sunlight. A Cormack and Lehane grade 1 view of the oedematous vocal cords was readily obtained, and successful endotracheal intubation was rapidly achieved at the first attempt. The endotracheal tube was clearly seen to pass through the vocal cords and enter the trachea. The Airtraq required minimal manipulation to obtain a close-up, panoramic, high-grade view of the larynx. Further evaluation of this device is warranted to define its role in the emergency department and in prehospital care.

The Airtraq laryngoscope (Prodol Meditec, Spain) is a novel, anatomically shaped, single-use device, which has just been licensed for clinical use in the UK (www.airtraq.com). This disposable plastic device consists of an optical channel that uses a conventional optical system consisting of a series of plastic mirrors and prisms, to obtain a high-grade, indirect close proximity view of the vocal cords. An intubating "guiding channel" enables intubation to be achieved under visual control. The device has a battery-powered light source and heating system designed to prevent the misting of mirrors when in contact with expired air.

Published reports of the use Airtraq laryngoscope are rare. To date, over 1000 patients undergoing elective anaesthesia have been intubated using this device, mainly in Spain (www.airtraq.com).

The case presented here describes the first report of its use in emergency airway management in prehospital care in a case of attempted suicide by hanging.

CASE REPORT

A 41-year-old man, weighing approximately 90 kg, attempted suicide by hanging from a noose attached to a tree branch using a ladder 20 feet off the ground to climb. He was asphyxiated for 3 min until he was cut down and the noose released with a pair of wire cutters.

The first ambulance service responders in a rapid response vehicle arrived 4 min after he was brought down. He was unconscious, unresponsive and centrally cyanosed, with signs of acute upper airway obstruction. An oral airway

was inserted with difficulty because of trismus.

A regional air ambulance crew (one doctor and paramedic) arrived 13 min after the patient was brought down after being tasked in the air. The patient was lying in a supine position on the ground with a Glasgow Coma Scale of 4 and exhibited extensor posturing. He was moving all four limbs, his pupils were 4 mm and reactive. He was bleeding into his upper airway, necessitating regular suctioning. He was centrally cyanosed on high-flow oxygen; his oxygen arterial saturations were not initially detectable because of poor peripheral flow. He was sweating profusely, peripherally cool and was incontinent of urine.

He underwent an uncomplicated rapid sequence intubation at the scene for airway control and safe onward transport to hospital using Etomidate and Suxamethonium.

The Airtraq was used as a primary intubating device. Intubation was readily achieved in <20 s, and minimal handling and manipulation of the device was required to produce a close-up complete view of the vocal cords, which were oedematous, but the larynx was otherwise intact. After detection of end-tidal carbon dioxide (Easycap), the patient was paralysed with pancuronium, and anaesthesia was maintained with morphine and midazolam boluses during transport to hospital in a helicopter.

He was extubated uneventfully on the third day after injury, and was discharged home 5 days after admission, and he subsequently made a full recovery.

DISCUSSION

This is the first time the Airtraq has been used in a prehospital care setting (Dr Pedro Acha, Airtraq designer, personal communication) and demonstrates the versatility of the device in the emergency setting in this challenging environment.

The decision to intubate the patient at the scene was made because of the need to protect the patient's airway in the face of significant upper-airway obstruction and the potential for further progressive upper-airway obstruction given the mechanism of injury, hypoxia despite high-flow oxygen administration, and the need to be able to safely transport the patient to hospital by air.¹

The decision to use the Airtraq was taken for several reasons. The patient required immediate advanced airway management, and there was no other option but to undertake this with the patient lying in supine position on the ground with in-line immobilisation. The author, who had had the opportunity to observe the Airtraq being used on six elective and emergency cases in the operating theatre (1 day) and had used the device in manikins, was the only clinician at the scene with direct experience of prehospital rapid sequence intubation. The Airtraq functioned extremely well in this context.

Despite undertaking the procedure in bright sunlight with bleeding into the upper airway, an excellent view of the glottis was readily obtained, with judicious use of suction. Of particular significance was that a grade 1 view was obtained with minimal handling and manipulation of the Airtraq to obtain an excellent view of the vocal cords. This is likely to be related to the anatomical shape of the device and is clearly valuable in the context of a potential unstable cervical spine injury. The high-grade view enabled the operator to clearly witness the endotracheal (ET) tube passing between the vocal cords during intubation, which allowed immediate visual confirmation of correct ET tube placement.

Manikin studies have recently demonstrated that anaesthetists,² and indeed novice users,³ can readily acquire the necessary skills to use the device successfully. Its use was favourable, compared with the use of Macintosh and Miller² blades in a manikin model.

At present, the only Airtraq commercially available is the adult-sized "regular" device that is designed for size 7.5–8.5 ET tubes. The manufacturers have designed two other smaller laryngoscopes—one for small adults (designed for 6.0–7.5 ET tubes, released May 2007)

Figure 1 Lateral view of new Airtraq laryngoscope preloaded with a 7.5mm cuffed endotracheal tube.

and the other paediatric (for ET tube sizes 4.5–5.5) due to be available in late 2007. These devices may have a role in future management of smaller adults and young children.

A video camera system, attachable directly to the proximal end of the laryngoscope, designed to enable projection and recording of the optical channel imaging on a laptop computer, is also available to facilitate training and to potentially support clinical governance.

Figure 2 Preloaded Airtraq laryngoscope from the front.

CONCLUSION

The Airtraq laryngoscope functioned well in the prehospital environment for this high-acuity and challenging patient. Further studies are warranted to define its role both within the emergency department and in the field care setting.

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Brownes Medical UK have supplied the author with a small number of Airtraqs, free of charge, for my clinical evaluation. Prodol have supplied the author with some Airtraqs and a video camera system for evaluation and to facilitate training, free of charge.

Figure 3 Airtraq laryngoscope from above.

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