

Australian and New Zealand College of Anaesthetists

Optical laryngoscopes – a new angle on intubation

Anthony Padley, Westmead Hospital, Sydney, Australia

Introduction

The past few years have seen a proliferation of optical laryngoscopes that do not require alignment of the oral, pharyngeal and laryngeal axes. If the patient can open their mouth 2.5-3 cm these instruments will usually provide a grade 1 view of the larynx when direct laryngoscopy fails. These devices therefore have a profound relevance to the management of the anticipated and unanticipated difficult airway and all anaesthetists should be adept with one or two types.

Types of Optical Laryngoscopes

The four most important types on the Australian market are the GlideScope, CTrach, Pentax-AWS and the Airtraq. The GlideScope was developed in the US in 2002 and looks like a conventional laryngoscope but has a camera in the blade tip. A video cable carries the camera image to a separate portable screen. Although easy to use and providing an excellent image of the larynx there is no guide for the ET tube. Several injuries to the palate, palatopharyngeal arch and other airway structures have resulted from trying to blindly maneuver the ET tube and introducer into view.^{1,2}

The CTrach was introduced in 2006 to improve upon the Fastrach by providing a fibre-optic bundle and clip on LCD screen. An advantage of the CTrach is that it provides an excellent conduit for ventilation. However the laryngeal view on the overly complex screen is often poor or absent (in 45% of cases in one study).³

Additionally intubation requires a large number of time consuming steps. The Pentax-AWS (Airway Scope) was developed in Japan and released in 2006. The handle contains batteries, a light source and a 5.3 cm LCD screen and is connected to a 12 cm cable with a camera unit at its distal end. The cable is inserted into a transparent lock on blade which has a guide for the ET tube. There is a suction port but no specific anti-fogging device.⁴

The Airtraq was developed in Spain and also released in 2006. It is the only single-use fully self contained optical laryngoscope and relies on a system of lenses, prisms and mirrors and its own battery powered light source and anti-fogging device. The image of the larynx through the large proximal lens is of excellent quality and panoramic. There is a grooved guide for the ET tube.

Choice of the Airtraq at Westmead Hospital

The Airtraq was chosen for use at Westmead Hospital because it is very easy and intuitive to use with intubation achievable in under 20 seconds. They are

relatively cheap (\$90 per unit) compared to the outlay required for the CTrach and GlideScope (\$15,000 each). Concerns over deterioration over time of complex components such as LCD screens and cameras are not relevant to the Airtraq.

Experience with the Airtraq Training in the use of the Airtraq has been provided by 3 senior anaesthetic consultants supervising intubations of mannequins and patients for elective surgery. In addition the Airtraq has been used successfully in the following situations up to the time of printing (numbers of patients in brackets):

- 1. Patients with a grade 3 direct laryngoscopy at a previous anaesthetic (3)**
- 2. Patients who were not predicted to have a difficult airway that could not be intubated despite BURP and use of a Teflon bougie (4).**
- 3. A patient with a suspected cervical spine injury.**
- 4. An awake intubation in a patient who had failed a previous intubation attempt at another hospital.**
- 5. A patient with severe facial trauma.**

In all the above cases except 5) a grade 1 laryngeal view was obtained. In the facial trauma patient the senior anaesthetist who used the device was able to visualize bubbles emerging from an area where he thought the larynx should be and successfully intubated the patient.

Conclusion:

Optical laryngoscopes such as the Airtraq have an emerging role in the management of anticipated and unanticipated difficult airway management. As long as the patient can open their mouth 2.5-3 cm these devices have a high probability of providing an indirect view of the larynx and enabling intubation. All anaesthetists should be familiar with at least one or two of these devices as they represent a significant advance in anaesthetic safety.

References:

1. Chin KJ, Arango MF, Paez AF, Turkstra TP. Palatal injury associated with the GlideScope®. *Anaesth and Intensive Care* 2007;35:449-50.
2. Cooper RM. Complications associated with the use of the GlideScope® video laryngoscope. *Can J Anesth* 2007;54:54-57.
3. Liu EH, Goy RWL, Chen FG. The LMA-CTrach a new laryngeal mask airway for endotracheal intubation under vision: evaluation of 100 patients. *Br J Anaesth* 2006;96:396-400.
4. Asai T, Enomoto Y, Shimizu K, Shingu K, Okuda Y. The Pentax-AWS Video-Laryngoscope: The first experience in one hundred patients. *Anesth Analg* 2007;106:257-259.