

SHORT REPORT

Airway Scope versus Macintosh laryngoscope: a manikin study

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Objective: To compare the performance of the Airway Scope for tracheal intubation with that of the Macintosh laryngoscope for direct laryngoscopy.

Methods: 10 anaesthetists, 10 residents, 10 nurses and 10 students intubated the trachea of a manikin using the Airway Scope or the Macintosh laryngoscope in each of 4 laryngoscopy scenarios.

Results: Within each group of operators, there was no significant difference in the time taken for intubation between the Airway Scope and the Macintosh laryngoscope. However, the overall number of teeth clicks was less in the Airway Scope, and the Airway Scope scored better on the visual analogue scale than did the Macintosh laryngoscope.

Conclusion: The Airway Scope performed as well as and perhaps better than the Macintosh laryngoscope when used on a manikin.

The Airway Scope (AWS, Pentax Corporation, Japan, fig 1A) is a new intubation device designed to provide a view of the glottis without requiring alignment of the oral, pharyngeal and tracheal axes.¹ The AWS has a built-in 2.4 inch liquid crystal display screen powered by standard AA batteries, which displays an image from a charge-coupled device camera attached to the tip of the AWS. A single-use blade protects the camera unit from oral contamination and accepts tracheal tubes with outside diameters between 8.5 and 11.0 mm. Once the target signal shown on the monitor has been aligned with the glottis opening (fig 1B), the tracheal tube is passed through the vocal cords (fig 1C). The purpose of this study was to compare the performance of the AWS for tracheal intubation with that of direct laryngoscopy (DL) with the Macintosh laryngoscope on a manikin.

METHODS

In all, 10 anaesthetists, 10 residents, 10 nurses and 10 students intubated the trachea of a Laerdal Airway Management Trainer under the following laryngoscopy scenarios: (1) sniffing position; (2) straight cervical position without pillow; (3) right lateral position; and (4) left lateral position.

The duration of tracheal intubation was defined as the time taken from insertion until removal of the blade between the teeth. Dental trauma was estimated on the basis of the number of audible teeth clicks with the manikin. Participants scored the ease of use of each device on a visual analogue scale (from 0, easy to 100 mm, difficult). Data are represented as mean (SD), and the AWS and DL groups were compared using Student's *t* test.

RESULTS

Table 1 shows the time required for intubation by each group. Within each group of operators, there was no significant

Abbreviations: AWS, Airway Scope; DL, direct laryngoscopy

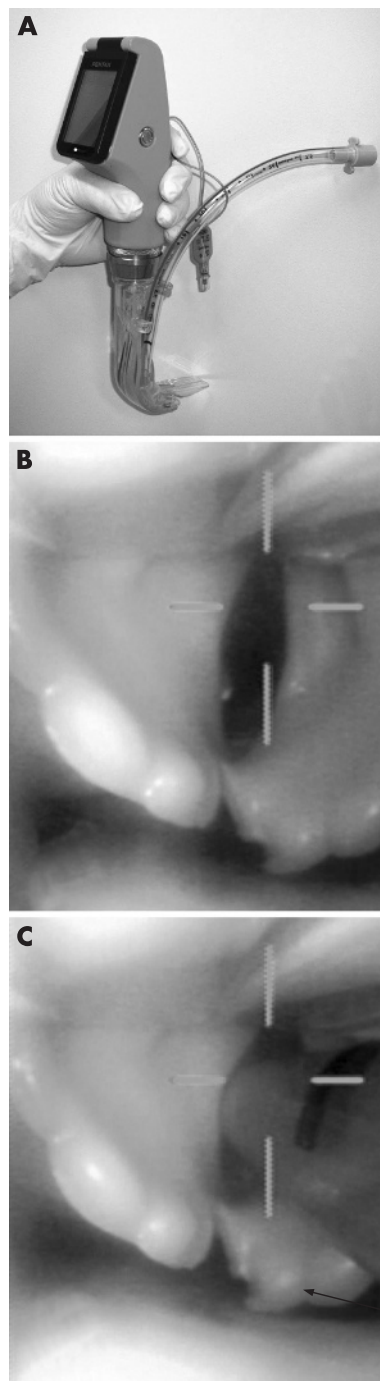


Figure 1 (A) The Airway Scope with a tracheal tube in place in the side channel. (B) The target signal shown on the monitor is aligned with the glottis opening. (C) The tube (arrow) is passed through the vocal cords.

Table 1 Time (s) for intubation and number of teeth clicks [times]

	Anaesthetists		Residents		Nurses		Students	
	AWS	DL	AWS	DL	AWS	DL	AWS	DL
SP	9.8 (3.8) [0]	11.1 (3.0) [2]	9.5 (2.8) [0]	10.9 (3.8) [0]	15.4 (11.0) [7]	9.6 (3.0) [15]	21.3 (16.1) [0]	15.5 (3.6) [2]
SC	8.3 (2.8) [0]	11.2 (5.2) [2]	8.3 (3.8) [0]	11.2 (3.8) [2]	9.3 (2.7) [3]	12.4 (4.3) [22]	9.6 (3.2)* [0]	13.3 (4.1) [1]
RL	10.6 (2.1)* [0]	13.8 (4.2) [0]	21.2 (13.3) [2]	14.9 (4.3) [2]	24.9 (18.5) [3]	23.6 (21.2) [7]	30.8 (26.5) [4]	19.6 (9.0) [3]
LL	11.7 (5.3) [0]	15.0 (7.8) [0]	20.3 (12.2) [2]	17.8 (14.9) [0]	20.3 (14.8) [3]	19.1 (10.3) [0]	25.6 (15.7) [0]	41.9 (24.9) [2]

AWS, Airway Scope; DL, direct laryngoscope; LL, left lateral position; RL, right lateral position; SC, straight cervical position without pillow; SP, sniffing position. Data are represented as mean (SD). Numbers in square brackets denote overall number of teeth clicks.
* $p < 0.05$ vs DL.

difference in the time taken for intubation between the AWS and the DL. However, the overall number of teeth clicks was less in the AWS than in the DL (24 vs 60 times, $p < 0.05$). The AWS also scored better on the visual analogue scale than did the DL (18 (18) vs 43 (18) mm, $p < 0.001$).

DISCUSSION

The AWS performed as well as and perhaps better than the DL when used on a manikin. Despite the lack of experience and unfamiliarity with the AWS, our participants preferred the AWS. These findings indicate easier usability of the AWS.

The time to achieve intubation of this study cannot be directly applied to patients, because the time was defined as the precise duration of laryngoscopy, which reflects the rapidity of intubation. However, the results were still valid for a direct comparison of two devices.

DL is currently the most widely used technique for tracheal intubation. This procedure is acknowledged, however, to be a

difficult skill for occasional users to master. The AWS seems to require less operator skill. A brief practice was the only requirements for tracheal intubation. The high-resolution charge-coupled device camera and the target signal shown on the monitor are helpful for non-anaesthetists who are required to perform tracheal intubation only infrequently.

Competing interests: None.

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