

A Prospective Study Comparing Standard Laryngoscopy to the Trachview™ Videoscope System For Orotracheal Intubation

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Background

Flexible fiberoptic bronchoscopy is a skill that can be difficult for emergency physicians to use in the setting of an emergent intubation. The TrachView™ Videoscope (TV) consists of a narrow high-resolution fiberoptic cable whose tip is positioned at the distal end of the endotracheal tube (ET). The image is displayed on a small portable bedside monitor. In this way, the TV does not alter the standard method of intubation but adds a second, possibly improved view of the vocal cords. The TV has never been formally studied.

Objective

To determine the ease of use and improvement in the percent of glottic opening (POGO) score using the TV by individuals of varied levels of intubation experience.



Trachview™ Videoscope System

Methods

The study was conducted in 2 phases on a mannequin model during an airway lab for EM residents and medical students in a university setting. Phase 1 consisted of a non-randomized group sequential study design in which, after a 10-minute demonstration of the TV, emergency medicine (EM) residents assessed the POGO score using direct laryngoscopy (DL) and compared it to their observed POGO score using the TV.

Phase 2 consisted of a cross-over study with first and second year medical students with no intubation experience. The students were randomized into two groups that differed by the method of intubation instruction given first: DL or TV. The students were given a 10-minute demonstration of each technique and had 2 attempts to return the demonstration. The POGO score noted by the student was recorded for each technique. The groups were then crossed and the process was repeated. Additional information collected from study subjects included ease of use of the TV and improvement in intubation using the TV.

Results

Phase 1: the residents consisted of 4 R1s, 10 R2s, and 11 R3s, and 3 participants whose level was not recorded. Overall, the median POGO score for DL was 50%, and the median POGO score for TV was 100% ($p < 0.001$). Median difference in POGO scores (TV – DL) were: 50% for R1s, 50% for R2s, 25% for R3s. As for ease of use, 85.7% (24) reported that the TV was “easy” to use, 10.7% (3) were undecided, and 3.6% (1) reported that the TV was “difficult” to use while 82.1% (23) reported that the TV improved their intubation attempt, 14.3% (4) reported no difference, and 3.6% (1) reported that the TV made intubation more difficult.

Phase 2: 37 participants. Median TV and DL POGO scores were 75% and 25%, respectively ($p = 0.004$). Median difference in POGO scores (TV – DL) for the two groups were: 75% for Group 1 and 50% for Group 2.

Overall, in phase 2, 67.6% (25) ranked the TV as “easy” to use, 21.6% (8) were undecided, and 10.8% (4) ranked the TV as “difficult” to use while 56.8% (21) reported the TV improved their intubation attempts, 27% (10) reported no difference, and 10.8% (4) reported the TV made intubation more difficult.

Conclusions

The Trachview Videoscope is easy to use and improves the POGO score and subjective evaluation of performance for intubation by individuals of varied experience levels.

References

1. Kaplan MB, Ward DS, Berci G. A new video laryngoscope – an aid to intubation and teaching. *J Clin Anesthesia* 2002; 14: 620-6.
2. Levitan RM. A new tool for teaching and supervising direct laryngoscopy. *Acad Emerg Med* 1996; 3: 79-81.
3. Levitan RM, Ochrock EA, Kush S et al. Assessment of airway visualization: validation of the percentage of glottic opening (POGO) scale. *Acad Emerg Med* 1998; 5: 919-23.
4. Levitan RM, Goldman TS, Bryan DA. Training with vide imaging improves intubation success rates of paramedic trainees in an OR setting. *Ann Emerg Med* 2001; 37: 46-50.
5. Weiss M, Schwarz U, Dillier CM et al. Teaching and supervising tracheal intubation in paediatric patients using videolaryngoscopy. *Paediatric Anaesthesia* 2001; 11: 343-8.
6. Schaefer HG, Marsch SC, Keller HL, Strebel S, Anselmi L, Drewe J. Teaching fiberoptic intubation in anaesthetised patients. *Anaesthesia* 1994; 49: 331-4.
7. Takizawa D, Sato E, Saruki N et al. Use of a fiberoptic stylet to visually evaluate tracheal intubation technique. *Anesth Intensive Care* 2000; 28: 552-5.