Comparison of GlideScope® Videolaryngoscopy to Direct Laryngoscopy for Nasotracheal Intubation

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Introduction

The GlideScope® videolaryngoscope (GVL) consistently provides a good laryngoscopic view when used for orotracheal intubation.[1] In the context of nasotracheal intubation, the GVL has been shown to be superior to direct laryngoscopy when used by airway management novices[2] and, in an observational trial, the GVL has demonstrated a high intubation success rate.[3] However, no study has compared direct laryngoscopy to GlideScope® videolaryngoscopy for nasotracheal intubation in a prospective, blinded, randomized clinical trial. This study was performed to test whether direct laryngoscopy is superior to the GVL for nasotracheal intubation, as judged by the time to intubation (TTI) and the ease of intubation.

Methods

- written informed consent obtained in patients having elective dental surgery requiring nasotracheal intubation
- randomized to either direct laryngoscopy or GlideScope®
- all operators experienced with GVL orotracheal intubation
- exclusion criteria: age < 18, known or suspected difficult airway, cervical spine instability, need for RSI
- operator blinded until intubation began
- TTI was assessed by a blinded observer:
  - start: mask removed from face
  - stop: end-tidal CO_2 (≥ 30 mmHg)
- ease of intubation recorded by operator on 100 mm VAS
- oropharyngeal suctioning ➞ amount of blood recorded
- on post-operative day one, the patient was asked about the presence and severity of a sore throat
- primary outcome: TTI analyzed by Mann Whitney-U test
- ease of intubation: VAS analyzed by Mann Whitney-U test
- dichotomous variables: either Fisher's Exact Test or χ^2 test

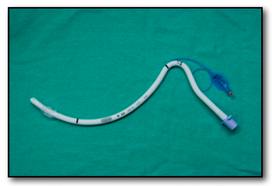

***Figure 1* - Nasal RAE endotracheal tube used in the study**

Results

- 70 patients recruited; demographic variables were similar between groups; one patient excluded (GlideScope group)
- compared to direct laryngoscopy, the GlideScope group:
  - had a superior time to intubation
  - had a superior ease of intubation
  - had better laryngeal grades
  - had a lower incidence of sore throat
  - had no Magill forceps usage
- similar incidence and severity of bleeding between groups

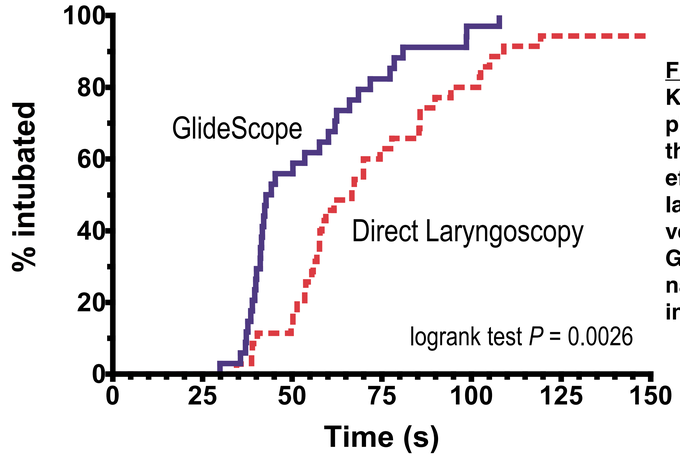

Figure 2
Kaplan-Meier plot showing the temporal effects of direct laryngoscopy versus the GlideScope for nasotracheal intubation

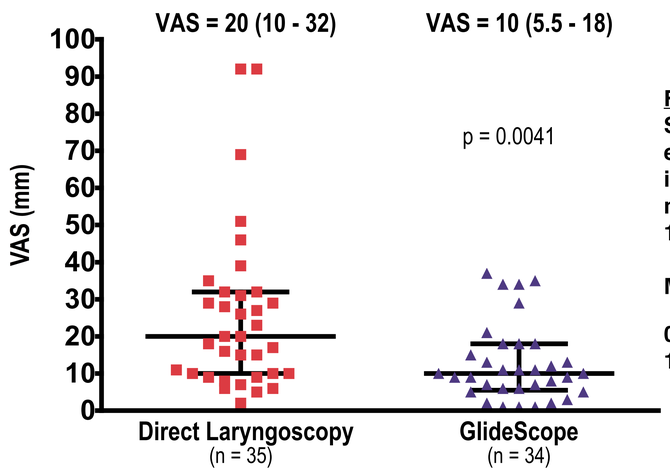

Figure 3
Scatterplot of ease of intubation as measured on a 100 mm VAS

Median and IQR

0 = easy
100 = difficult

Outcomes

Outcomes	Direct Laryngoscopy (n = 35)	GlideScope (n = 34)	*P*
Time to intubation, s, median (IQR)	66.7 (53.8 - 89.9)	43.5 (39.8 - 67.3)	0.0023
Ease of intubation VAS, mm, median (IQR) [higher number = more difficult]	20 (10 - 32)	10 (5.5 - 18)	0.0041
Moderate or severe sore throat, n (%)	12 (34%)	3 (9%)	0.018
Cormack-Lehane laryngoscopic grades, n (%)			
Grade 1	23 (66%)	32 (94%)	0.0057
Grade 2 or higher	12 (34%)	2 (6%)	
Moderate or copious bleeding, n (%)	6 (17%)	8 (24%)	0.56
Magill forceps used, n (%)	17 (49%)	0	<0.01
Operators, experienced / inexperienced	6 / 9 (40/60%)	5 / 8 (38/62%)	1
First-attempt success rate, n (%)	32 (91%)	33 (97%)	0.61
Failures to intubate, n, (%)	2 (6%)	0	0.49

Conclusions

- in a heterogeneous group of operators and patients, the GlideScope results in a clinically important and statistically significant reduction in the time to intubation compared with direct laryngoscopy
- the GlideScope results in improved glottic exposure and an easier nasotracheal intubation
- reduced incidence of sore throat occurs when performing nasotracheal intubation using the GlideScope
- Magill forceps seem unnecessary when using the GVL
- the first-attempt success rate for nasotracheal intubation using the GVL is very high
- the GlideScope has a clear role in routine nasotracheal intubation, and it is an excellent "first choice" device

References

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3. Xue F, Zhang G, Liu J, et al. A clinical assessment of the Glidescope videolaryngoscope in nasotracheal intubation with general anesthesia. J Clin Anesth 2006; 18: 611-5.

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