A Comparison between Direct Laryngoscopy, Truview PCD® and Glidescope® in pediatric patients

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Introduction:
Advances in airway management have led to development on videolaryngoscopy devices such the Glidescope® and the Truview PCD. The Glidescope has 60° angle blade and the Truview has 46° angle refraction. Despite a good experience using Glidescope in adults, few studies have been published in pediatric patients. The aim of this study is to compare the effectiveness of the Glidescope and the Truview against direct laryngoscopy (DL) in pediatric patients by comparing laryngeal views, time taken to intubate, the hemodynamic response and episodes of de-saturation.

Methods:
After Institutional Review Board approval, 134 patients, 0-10 years of age, ASA physical status I-III, for elective general surgical procedures were randomized to oral intubation using Truview, Glidescope, or Direct Laryngoscopy (Macintosh blade). The laryngoscopic view was scored using the Cormack-Lehane scale. Time to intubation (TTI) defined as the time from when the device entered the mouth until end-tidal CO2 was detected as well as the number of attempts and hemodynamic changes were recorded. The intubations were performed by three staff anesthesiologists.

Results:
Neither Glidescope (P>0.99) nor Truview (P=0.18) were superior to DL on Cormack-Lehane grade and was significantly worse using Glidescope as compared to DL (P < 0.001). The incidence of Cormack-Lehane grade I was significantly lower with Glidescope than with Truview (14% versus 82%, 95% CI: -91%, -46%). The observed median [Q1,Q3] TTI were: 39 [31,59], 44 [28,62] and 23 [21,28] seconds, for Glidescope, Truview, and DL with median differences of 14 seconds (95% CI: 7, 26) (Glidescope-DL) and 17 seconds (6, 28) (Truview-DL) respectively. No difference was found in mean hemodynamic responses during the period from intubation time.

Discussion: In this study, we found that Glidescope was less effective than the standard direct laryngoscopy, given the evidence of worse view and inferiority on time to intubation. Although the view was not different between Truview and direct laryngoscopy, Truview PCD was inferior in time to intubation.

References:
3. Truphatek International Ltd. Truview EVO2 optical view laryngoscope. Available at http://truphatek.com
Table 1. Comparing Glidescope, Truview and Direct Laryngoscopy on view and time to intubation.

<table>
<thead>
<tr>
<th>Primary Outcome</th>
<th>Glidescope (N = 44)</th>
<th>PCD (N = 45)</th>
<th>Laryngoscopy (N = 45)</th>
<th>Difference (95% CI)</th>
<th>Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cormack-Lehane grade</td>
<td>6/13/23/2</td>
<td>37/7/1/0</td>
<td>34/6/5/0</td>
<td>0 (^{\text{a}})</td>
<td>1 (1, 2)</td>
</tr>
<tr>
<td>(1/2/3/4) – No.</td>
<td></td>
<td></td>
<td></td>
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<td>Intubation time – seconds</td>
<td>39 [31-59]</td>
<td>44 [28-62]</td>
<td>23 [21-28]</td>
<td>14 (7, 26)</td>
<td>&gt; 0.99 (^{\text{b}})</td>
</tr>
<tr>
<td></td>
<td>(16-302)</td>
<td>(21-345)</td>
<td>(16-70)</td>
<td></td>
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</tbody>
</table>

DL = Direct Laryngoscopy

Summary statistics are presented as number of patients, median [1\(^{\text{st}}\)-3\(^{\text{rd}}\) quartiles] (minimum-maximum); CL = confidence interval

\(^{\text{a}}\) Superiority of each of Glidescope and Truview PCD versus DL on Cormack-Lehane grade was assessed using a 1-tailed Wilcoxon sum-rank test against a difference of 0 (< 0 indicates superiority) with significance criterion of P < 0.0015. Neither group was superior to DL; Glidescope was inferior.

\(^{\text{b}}\) Noninferiority of each of Glidescope and Truview PCD to DL on time to intubation using the a priori noninferiority delta of 7 seconds was assessed using a 1-tailed Wilcoxon rank-sum test with significance criterion of P < 0.0015; since the upper limit of the confidence interval is well above 7 seconds for each comparison, noninferiority was not claimed for either (P>0.99)