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Predictors of Difficult Intubation with the Video Laryngoscope

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Introduction: Anesthesiologists choose which airway device to use for difficult intubation, taking into account each patient's specific features. The video laryngoscope (VL) allows equal or superior glottic visualization compared with direct laryngoscopy (DL), but predictive features for intubation difficulty using the VL have not been identified.[1] We therefore undertook a prospective observational study to identify which patient characteristics are likely to predict intubation difficulty with the VL. Principal outcomes were time to intubation and number of attempts.

Methods: Following approval from the IRB and each participant, patients were prospectively enrolled before surgeries requiring endotracheal intubation. Demographic and morphometric factors known to be associated with difficult DL, or believed to influence the use of the VL, were recorded preoperatively. After induction of anesthesia and adequate muscle relaxation, regular DL was performed in all patients to assess the Cormack and Lehane (C&L) grade of glottic visualization. Then intubation using the VL was accomplished. The number of attempts and time needed for intubation were recorded. For statistical analysis, correlation coefficients (Pearson or Spearman) between patients' characteristics and time needed to intubate or number of attempts were calculated. Significantly correlated variables were then introduced in multiple regression models. A P value < 0.05 was considered statistically significant.

Results: Four hundred patients were studied. Intubation required 1/2/3 attempts in 342/48/9 patients, respectively; 1 patient could not be intubated with the VL. Mean intubation time was 211.4 seconds. In the univariate correlation analysis, the following characteristics were significantly correlated with time to intubate: age, male sex, snoring, Mallampati class, mouth opening, sternothyroid distance, manubriomental distance in extension, neck circumference, and C&L grade as noted during DL. The need for multiple attempts was correlated with snoring, Mallampati class, sternothyroid distance, manubriomental distance in extension, and C&L grade as noted during DL. However, after introducing these variables in multiple regression models, only higher C&L grade at DL (P < 0.0001) and shorter sternothyroid distance (P = 0.007) were associated with longer intubation times, while only higher C&L grade predicted multiple attempts (P = 0.0006).

1. *Jungbauer A, Schumann M, Brunkhorst V, Borgers A, Groeben H. Expected difficult tracheal intubation: a prospective comparison of direct laryngoscopy and video laryngoscopy in 200 patients. Br J Anaesth 2009; 102:546–550.*