

ABSTRACTS

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All authors have certified that, where appropriate, studies have been conducted with the approval of the relevant institutional Human Ethics Committee or Animal Experimental Review Committee.

Video versus augmented direct laryngoscopy in adult emergency department intubations

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Videolaryngoscopy (VL) improves glottic view and first-attempt success (FAS) of tracheal intubation compared with direct laryngoscopy (DL) in emergency department (ED) patients, and its use in preference to DL has steadily increased.¹ DL can be augmented (A-DL) to improve glottic view and intubation success through ramped positioning, external laryngeal manipulation (ELM), and use of a bougie. Data are lacking regarding how A-DL compares with VL in the ED.

This was a 25-centre prospective observational study of intubations in the ED comparing unaided VL to permutations of A-DL using multivariable regression (MVL) models. We report differences in first-attempt intubation success and adverse events with cluster-adjusted odds ratios (ORs) and 95% confidence interval (CI). We report univariate comparisons using descriptive statistics with OR and 95% CI. Each centre obtained ethics board (IRB) approval before data collection.

There were 11 714 intubations recorded from January 1, 2016 through December 31, 2017. Of this total, 6938 had a first intubation attempt with either A-DL or unaided VL. A-DL was used first in 3936 (56.7%; 95% CI, 46.9–66.5) vs unaided VL in 3002 (43.3%; 95% CI, 33.5–53.1). Of the A-DL first intubations, 1787 (45.4%) used ramped positioning alone, 1472 (37.4%) had ELM, and 365 (9.3%) used a bougie. Rapid-sequence induction was used in 5602 (80.8%; 95% CI, 77.0–84.5) cases. FAS was higher

with VL (90.9%; 95% CI, 88.7–93.1) vs all A-DL (81.1%; 95% CI, 78.7–83.5). MVL controlling for indication, method, operator, centre clustering, and all recorded difficult airway characteristics revealed FAS was higher with unaided VL compared with any A-DL (OR=2.8; 95% CI, 2.4–3.3), DL with bougie (OR=2.7; 95% CI, 2.1–3.5), DL with ELM (OR=1.8; 95% CI, 1.5–2.2), DL with ramped positioning (OR=2.8; 95% CI, 2.3–3.3), or DL with ELM and bougie (OR=2.8%; 95% CI, 2.3–3.3). The overall adverse event rate was similar between the two groups although fewer oesophageal intubations were observed in the VL cohort (0.4% vs 1.3%; adjusted OR=0.2; 95% CI, 0.1–0.5) Fig. 1.

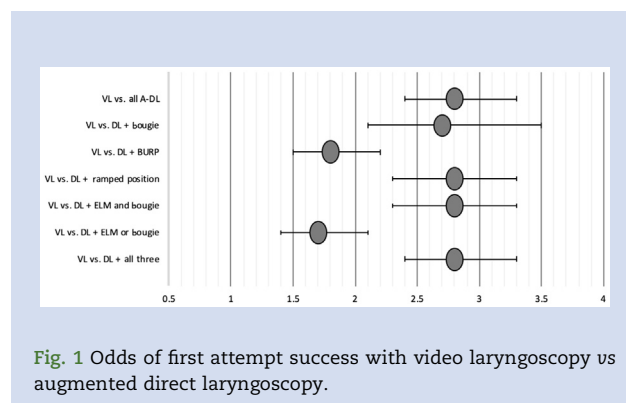


Fig. 1 Odds of first attempt success with video laryngoscopy vs augmented direct laryngoscopy.

VL, without any augmenting manoeuvre or device, produces higher FAS than DL augmented by use of a bougie, ELM, ramping, or combinations thereof.

References

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Professional attitudes to a 'smart' tracheal tube: report of a survey of Difficult Airway Society delegates in 2018

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The intra-Tracheal Multiplexed Sensing endotracheal tube (iTraXS) was developed in collaboration by the University of Nottingham, Nottingham University Hospitals, and P3 Medical Ltd (Preston, UK), and funded by the National Institute for Health Research's i4i programme (II-LA-0813-20008; see Fig. 2). iTraXS allows continuous monitoring of multiple core standard physiological parameters such as temperature and oxygen saturations, and a range of novel cardiovascular data, including tracheal mucosal contact pressure and mucosal ischaemia. The potential benefits of such technology include reduced tracheal mucosal injury, reduced micro aspiration, reliable central monitoring, and confirmation of tracheal placement.

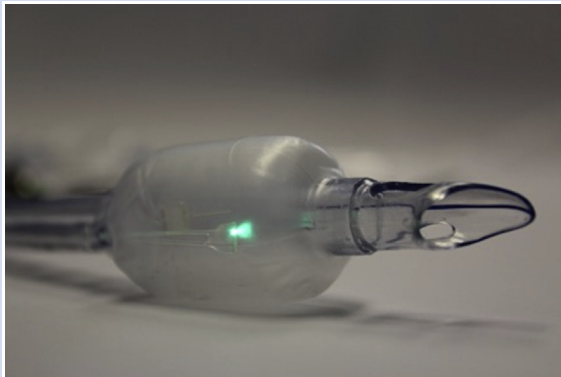


Fig 2 The intra-Tracheal Multiplexed Sensing endotracheal tube (iTraXS)

The Difficult Airway Response Team programme: a 10-yr follow-up

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Failures of airway management are a major source of morbidity, mortality, and hospital liability. We previously described the implementation of the Difficult Airway Response Team (DART) programme, a multidisciplinary collaboration between anaesthesiologists, otolaryngologists, emergency physicians, and trauma surgeons.¹⁻³ We report on aspects of the 10 yr experience of the DART programme.

This institutional review board (IRB)-approved study included all events for which DART was activated to manage adult patients from July 2008 to July 2018. The DART database was used to collect demographic and event data, including

intubation technique and success or failure of each attempt. χ^2 testing with pairwise Bonferroni correction ($P \leq 0.05/6 = 0.0083$, statistically significant) was used to compare intubation technique success rates. Linear regression was used to model the change in technique prevalence over time.

During the period studied, 729 DART activations were recorded (57.8% males, mean [standard deviation, SD]; age: 55.6 [16.7] yr). The predominant locations for DART activation were intensive care units ($n=373$, 51.1%) and the emergency department ($n=143$, 19.6%). Of 729 patients, 125 (17.1%) were transported to the operating room for management. Risk factors for DART activation included known difficult airway, angioedema, current tracheostomy, airway bleeding, and BMI $>30 \text{ kg m}^{-2}$. The primary techniques used were videolaryngoscopy (VL), direct laryngoscopy (DL), fiberoptic bronchoscopy (FOB) techniques, rigid laryngoscopy (RL), and surgical airway; supra-glottic airway was used as part of airway management in 58 (8.0%) activations. Linear regression showed a significant increase over time in the percentage of attempts with VL (slope = $3.0\% \text{ yr}^{-1}$, 95% confidence interval = $1.8-4.2\%$, $P=0.0005$). χ^2 analysis revealed higher rates of success for FOB techniques (133/179, 74.3%) than for either DL (143/277, 51.6%) or VL (142/267, 53.2%) ($P < 0.00001$ for both). RL (48/74, 64.9% successful) was associated with higher success rates than DL ($P=0.04$) or VL ($P=0.07$), but these results were not significant after Bonferroni correction. Overall, 56 (7.7%) patients required a surgical airway (cricothyrotomy or tracheostomy). No airway-related mortalities occurred during DART activations.

The DART programme has successfully prevented airway-related mortality. Despite the increasing use of VL, other techniques, including surgical airways, continue to be invaluable for patient safety. Institutions should consider customising the DART programme to optimise their clinical practice.

References

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Paediatric emergency front-of-neck access: accuracy of cricothyroid membrane identification and hypothetical incision lengths

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The cricothyroid membrane (CTM) is the recommended site for emergency front-of-neck access (eFONA) in children in a cannot intubate, cannot oxygenate (CICO) scenario. We investigated the following: (1) accuracy of ultrasound in identification and measurement of CTM dimensions; (2) clinician accuracy in CTM localisation by palpation; and (3) the starting point and length of different hypothetical vertical incision strategies required to expose the CTM.

The study was a prospective observational study performed in a tertiary paediatric university hospital. Ethical