

Proof of concept of Video Laryngoscopy Intubation: Potential utility in the pre-hospital environment by Emergency Medical Technicians

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Background

- Endotracheal intubation was once considered the optimal method of managing an airway during cardiac arrest.
- Endotracheal intubation requires skill mastery, and frequent practice to maintain proficiency.^{1,2}
- In the emergency pre-hospital setting, research has shown that the frequency of oesophageal or unsuccessful intubation is unacceptably high.³
- One potential solution is video laryngoscopy (VL) which permits better visualisation of the glottis than the standard method of direct laryngoscopy (DL).⁴
- VL has resulted in a higher first attempt success rate and fewer failed intubations.
- The utility of VL for those who infrequently intubate has not been thoroughly assessed.

Aim

- We sought to evaluate this equipment to determine whether in the hands of novice providers this equipment could prove an effective airway management adjunct.

Methods

- DL and two VL methods (C-Mac with distal screen / C-Mac with attached screen) (Figure 1) were evaluated by simulating practice on a Laerdal airway management trainer manikin.
- Twenty Emergency Medical Technicians (Basics), were recruited as novice practitioners.
- This group was used to eliminate bias, as these clinicians had no pre-hospital experience of intubation (although they did have basic airway skills).
- The following areas were assessed:
 - Time taken to intubate
 - Number of attempts required to successfully intubate
 - Ease of use of equipment



Figure 1: (a) Direct Laryngoscopy; (b) C-Mac with distal screen; (c) C-Mac with screen attached

Results

- Numeric data was tested for normality and summarised using median (range) for skewed data or mean (standard deviation) for normally distributed data.
- Non-parametric tests for related samples were used to compare median intubation times across groups (type of laryngoscope).
- Repeated measures ANOVA was used to compare mean difficulty ratings across groups.
- Success rates across groups were compared using the chi-square test.
- A 5% level of significance was used for all statistical tests and the statistical software package SPSS Version 21 for Windows was used for the analysis.
- C-Mac with distal screen and the direct laryngoscope were comparable on intubation times (Figure 2), success rate, gastric inflation rate and rating of difficulty (Figure 3).
- Data may suggest that after initial learning, C-Mac with distal screen has the potential to have lower intubation times and ratings of difficulty.
- C-Mac with attached screen tended to have higher intubation times, lower success rates, and higher ratings of difficulty. (Figures 2 & 3)

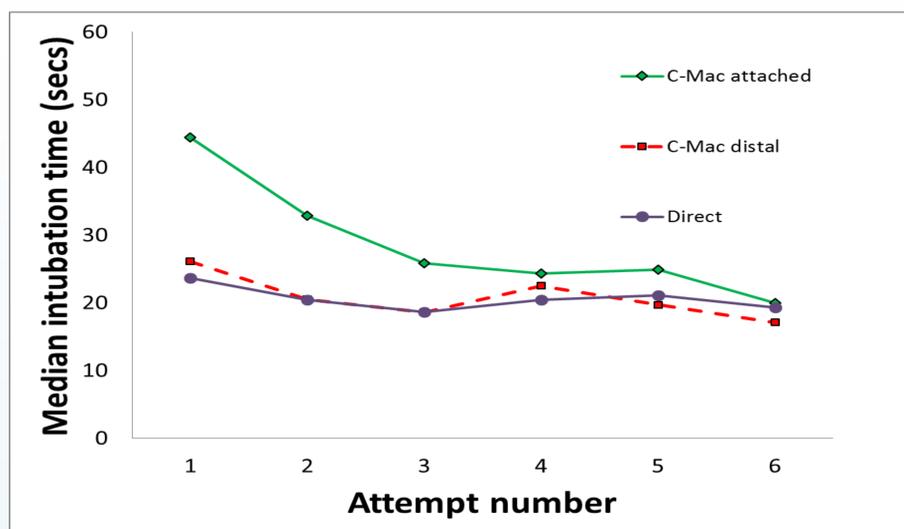


Figure 2: Median intubation time

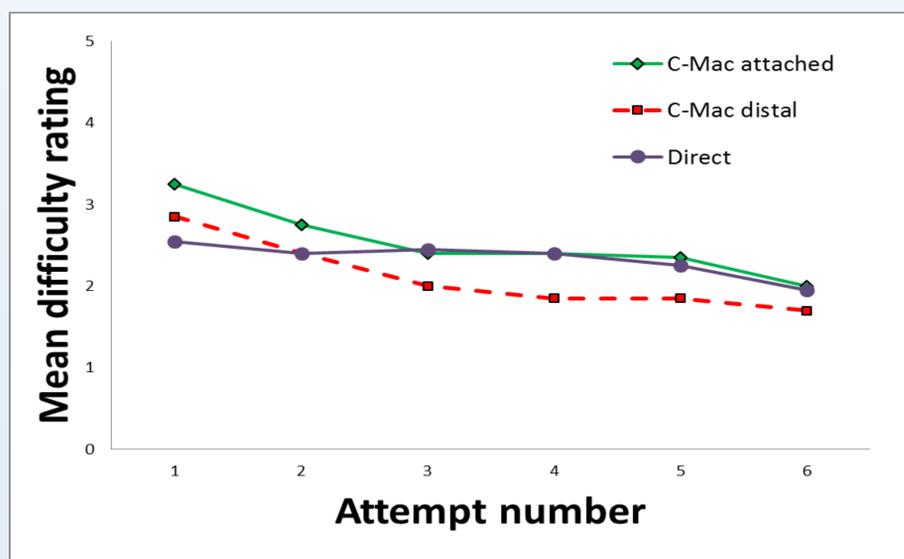


Figure 3: Mean difficulty rating by attempt number and type of laryngoscope

Conclusion

- VL (attached screen) took on average longer for novice clinicians to successfully intubate and had a lower success rate and reported higher rating of difficulty compared to DL.
- VL (with distal screen) and DL were comparable on intubation times, success rate, gastric inflation rate and rating of difficulty by the user.
- This study highlights that routine use of VL by inexperienced clinicians would be of no added benefit over DL.
- Further studies are required to determine whether Emergency Medical Technicians (Paramedics) would benefit from this airway adjunct, and ascertain whether after initial mastery of VL (with a distal screen), lower intubation times and difficulty rating may be achievable

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