Reviewer's report

Title: A randomised, controlled crossover comparison of the C-MAC videolaryngoscope with direct laryngoscopy in 150 patients during routine induction of anaesthesia

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Reviewer: Richard Cooper

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Abstract
The term C-MAC Miller is confusing. I had read this over several times thinking that Storz had in fact produced a C-Miller blade. Perhaps the authors would consider abbreviating this as C-MAC/MT (for Miller technique) so that the Miller blade design is not so strongly suggested.

“no optimal glottic view with DL” is awkward phrasing.

“impeded glottic view”-consider “suboptimal” or Cormack-Lehane>1

Methods includes Results (eg age, gender, weight)

Background
the purpose of the study should be more precisely stated. What specifically do the investigators wish to compare--the laryngeal view, time to intubation, success or complication rate? It is reasonable to state these explicity in the Methods section.

Methods and methodology
page 4, line 2: change “details” to “detail”
page 4, line 3: change “steel blade shape” to “stainless steel Macintosh-shaped blade”
what is meant by “edges are slant”

methods and results have been combined: eg. details regarding the gender, age, weight. Details regarding the demographics should be moved to Results.

What was the rationale for using the MAC 3 and 4 blades interchangeably? Generally, the larger blade would be reserved for larger patients. Please confirm whether randomization was to DL, C-MAC3 or C-MAC4/Miller4 rather than DL or C-MAC.

“Since it became obvious after 50 patients...” belongs in the Results section. In the Methods section, it should state that after the initial 50 patients, randomization for the initial laryngoscopy was to either C-MAC 3 or C-MAC 4 Miller.”

Did each patient undergo three laryngoscopies in a randomized sequence?
“Patients were excluded if…” should be “if pathology of the upper respiratory or alimentary tract were known or suspected, or if a rapid sequence induction was indicated. In addition, patients were excluded if an awake intubation was appropriate due to a suspected or known difficult airway.” Please confirm that “pathology of the upper airway” does not include features suggestive of a difficult direct laryngoscopy.

“reclination” should be changed to “cervical extension”

how was randomization achieved?
how was the sample size determined?
please provide details concerning the technique used (e.g. midline vs. right-sided insertion, use or avoidance of stylet, prior application of an anti-fogging spray to the blade)
when BURP was used, was this at the discretion of the anesthesiologist or was its use prescribed by the experimental protocol. This must be clearly stated in the Methods section. Please clarify whether that we are not comparing views obtained in one case with and the other without BURP.
It is confusing to refer to the modification by “Lee-Yentis” (reference 14), suggesting that this may differ from the paper they actually referred to in reference 14 (wherein Yentis is the first author).
how was the ease/difficulty of intubation scored?
how was “handling” defined and rated? Were any guidelines provided?

Results

Table 1 (gender (female/mail; n (%))--omit % since not provided
Please provide the mean (SD) time to successful intubation; it appears that several patients required multiple laryngoscopic attempts using the C-MAC yet the median times are not very much different from DL which required a single attempt in 48/50 patients. It is unclear what p=0.21 pertains to. Which values are being compared? In the subsequent paragraph, it is unclear was p=0.32 refers to. Again, please express the times to intubation as mean (SD)
The use of a gum elastic bougie was required relatively often in all the C-MAC patients. What were the indications for using the gum elastic bougie? Was this used in lieu of a stylet? It is unclear how many patients required BURP to achieve the C/L views detailed in Table 2. If a view other than C/L 1 was obtained, was BURP routinely deployed? Was BURP used more or less commonly with DL or C-MAC/Miller?
fogging was seen in 11/150 (7.3%) cases despite the claims by Storz that this product is fog-resistant.
please explain what is meant by “dazzling” of the monitor screen. Did either the fogging or “dazzling” image interfer with the operator’s ability to perform intubation? Were these relatively minor impediments?

The legends are incorrect. There are three legends but 4 figures. Figure 2 is not
described at all. It should be better labelled. I cannot see anything resembling a Miller style blade. Figure 4 (described in Legend as Figure 3a and 3b) is poorly described. Although 20 patients had better C/L scores with VL, the observation that better laryngeal views were obtained in 6 patients with DL, is almost without precedent for indirect laryngoscopy.

Discussion

the statement that “if the video view is worse than the direct view, as observed in six patients in the present study, or the intubation itself is difficult due to high blade angulations [16]” is confusing since the latter refers to a different device, not the C-MAC.

It is unclear from this study whether the user can actually achieve the best of direct or indirect viewing using a single device, since they were not comparing intubation by direct laryngoscopy using the same device. It would be reasonable to refer the reader to a previous publication by the same group (reference 4) that addresses this issue.

a full 8% (12/150) patients required GEB. Are these patients who might have been successfully managed using a stylet? Complications reporting with the GlideScope (references 19-23) were not likely to have resulted from the stylet, which in all cases were recessed within the ETT, but rather from the failure to directly observe the insertion of the ETT into the mouth and passed the palatopharyngeal folds. This complication is entirely avoidable with good technique and is misrepresented in this report.

It may be accurate to suggest that a more highly-angulated blade prolongs the time required to complete endotracheal intubation. In the subsequent paragraph, however, the authors make the statement that “Videolaryngoscopy is not a technique to make endotracheal intubation faster...[but] to make intubation safer.” Interestingly there are almost no reports of better views being obtained by DL compared with VL using the more highly-angled devices. In fact, Storz is about to release a “D-blade” that is quite similar in shape to the angled GlideScope (Verathon) and McGrath (Aircraft Medical).

**Level of interest:** An article of importance in its field

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I am an unpaid consultant to and former investor in Verathon Medical, manufacturers of the GlideScope, a competing product. I have been on the Speaker’s Bureau for Verathon and Aircraft Medical and have received
equipment from Verathon, Aircraft Medical and Storz (for evaluation).