Reviewer’s report

Title: Bougies as an aid for endotracheal intubation with the Airway Scope: bench and manikin comparison studies

Version: 1 Date: 06 Jul 2017

Reviewer: AK Riegel

Reviewer’s report:

Dear Dr. Takenaka and Team,

thank you for your corrections and especially for the Addition of figure 2 and the manikin study. I was happy to read that you found a suitable manikin for the purpose since I think that it is essential to use a good manikin for an appropriate study.

Abstract:

- "Types of bougie" or "types of bougies" (?) I am not a native speaker, but this would sound more familiar to me.

- P. 6 line 22: Please label in Figure 1 and 2 also the "proximal" end with "proximal". Please consider to delete the "proximal" in Figure 1 since this is very confusing. The definition of your proximal and distal ends should be explained in your methods section since also the other way round (the closer to the middle of the body facing part would be labeled as proximal would make sense). Alternatively you could use "upper" and "lower" end ((or "oral" and "aboral")) or something similar. Please follow the recommendations of the Editor. If he thinks, its clear enough, I am fine with leaving it the way it is, however please label then "proximal" to the proximal ends in Figure 1 and 2.

- Please explain what you want to say: "Although there were no significant differences in success rate between the four bougies, some anesthesiologists failed to intubate with the Portex single-use and Frova bougies" It seems impossible. If with Portex and Frova some anesthesiologists failed, then there must be a difference in success rate?

- Conclusion: I would correct it to: "Venn reusable and Boussignac bougies are a useful aid for intubation with an AWS. Frova and Portex bougies seem to be less suitable for this technique. It should be cautioned that all bougies are not of equal value when difficulty is encountered with intubation with an AWS."
- P. 7 Line 13: Suggestion: "The Airway Scope (AWS, HOYA-Pentax, Tokyo, Japan), belongs to the family of channeled videolaryngoscopes with a built-in monitor (like the Airtraq® or optional the King Vision® videolaryngoscope). The blade is designed to match the anatomy of the upper airway and provides an excellent view of the glottis, even in patients with difficult airways [1,2]."

I would suggest to mention it early in the text, that the Airway Scope is a channeled videolaryngoscope, and maybe also mention alternative similar products, it helps immensely that people who know channeled videolaryngoscopes or Airtraq or the channeled King vision immediately know what you are talking about. Thank you also for adding the excellent picture / figure 2 to your manuscript. It clarifies perfectly visual what you are talking about and simplifies understanding of your study a lot.

- P.7 Line 41-43: …AWS blade and can be advanced into the…" would be my suggestion.

Methods:

- P.8 Line 13: 5 years' ? or 5 years? I never saw years with an " ' " before.

- P.8 Line 32-34: Please explain to me more what you mean with "The tip of the AWS blade was set 15 mm above the circular protractor that was lying horizontally on a flat surface." In your figures I do not see a protractor which lies horizontally on a flat surface.

- P.8 Line 55-57: Please explain more in detail: "The bougie was then exchanged and the rotation angles at the distal end were measured in the same fashion." Does this mean you inserted the bougie the other way round again?

- P.9 Line 2-4: As the others asked: How were the other anesthesiologists blinded? Since all of the bougies most likely look a little different, it seems impossible that they could not differentiate between the bougies. How did you do that?

→ Please delete that section since you write in the discussion part: "First, it was impossible to blind the anesthesiologists to the bougie being used, potentially biasing measurement of the rotation angle of the bougie tip.

- P.9 Line 45-47: Suggestion "…according with a predetermined sequence (Table 2), the anesthesiologist attempting intubation with each of them in the same fashion." To "…according with a predetermined sequence (Table 2) and the anesthesiologists were attempting intubation with each of them in the same fashion."

- P.9 Line 26-29: I would suggest changing: "The manikin was placed supine without a pillow on a flat table, after which the anesthesiologist inserted an AWS blade into its mouth until its tip was positioned in the vallecula like a Macintosh blade." Into "The manikin was placed supine without a pillow on a flat table. Next, the anesthesiologist inserted an AWS blade into its mouth until its tip was positioned in the vallecula." Since the insertion ways are most likely
midline for AWS and different for Macintosh blade, I would skip "like a Macintosh blade" even if you most likely just want to say that for Macintosh and AWS positioning the vallecular region is the aim.

- Please follow the recommendations of the Editor in the following point: to me, esophageal intubation should not be counted as 121 seconds. Also an intubation trial without success cutted of at 120 seconds should not be counted as an intubation. This should be reflected in the successful - unsuccessful table. The differences in intubation times should be calculated only from the successful intubations.

- Tracheal tube cuff passing the vocal cords: how did you assess this? How could the assistant see the cuff?

Results:

- P. 11 Line 4: suggestion: …failed to achieve tracheal intubation…

Discussion:

- P.12 Line 24: "For example, bougies are reportedly useful for assisting intubation with an Airtraqs"

  please change to singular "Airtraq".

- P.12 Line 41-44: "Moreover, there have been some cases of displacement of the epiglottis and its prolapse into the trachea beside the tracheal tube during attempts at intubation an AWS" does not sound correct to me. Please consider changing to: "Moreover, there have been some cases of displacement of the epiglottis and its prolapse into the trachea beside the tracheal tube during attempts of intubation with an AWS."

- Addition wanted, deletion made?

Figure 2:

- Is the "distal" protractor aligned correctly? It seems like the inferior corner is not aligned to the middle of the protractor on the picture. Please correct it accordingly.

Maybe this was a misunderstanding? Was it asked if you could tell us more about the material properties and possible explanations for difficult rotation. Could you please add this?

Please answer point by point with the copied text into this document, so I do not have to search for the text passages in your text. Which will make it easier for me and less time consuming. Thank you.
Kind regards

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
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I recommend additional statistical review

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