McGrath MAC versus Macintosh for perioperative endotracheal intubation: A re-analysis of a recent Cochrane review

Ubong Silas[1], Sita Saunders[1], Rhodri Saunders[1], Alistair McNarry[2]

(1) Coreva Scientific GmbH & Co. KG, Königswinter, Germany; (2) Department of Anaesthesia, NHS Lothian, Edinburgh, UK

Introduction

- Cochrane evidence demonstrates that video laryngoscopy (VL) is better than direct laryngoscopy (DL) for successful tracheal intubation.[1]
- Multiple devices are available, meaning that identifying a particular device based on available evidence can be challenging.
- We reassessed the Cochrane meta-analysis to specifically compare McGrath MAC (Figure 1) versus Macintosh DL.

Methods

- We reviewed the randomized controlled trials (RCTs) included in the Cochrane review, selecting only RCTs that used McGrath MAC VL compared with Macintosh DL in perioperative care.
- Outcomes assessed were:
  - First-pass success (FPS)
  - Failed intubation
  - Esophageal intubation
  - Dental injury
  - Hypoxemia
- Meta-analysis was performed using RevMan 5.4.[2]
- Failed and esophageal intubations are rare events and were therefore assessed using the Peto odds ratio (OR).[3]
- The risk ratio (RR) was used for FPS and we present it alongside the original result from the Cochrane review where all Macintosh-style VL devices were grouped together.[1]

Figure 1. McGrath MAC Next Generation video laryngoscope

Table 1. Re-analysis of Cochrane review comparing only McGrath MAC with Macintosh

Outcome	Re-analysis RR or OR [95% CI]	Cochrane review* RR [95% CI]
First pass success, RR	1.07 [1.01, 1.15]	1.05 [1.02, 1.09]
Failed intubation, OR	0.33 [0.12, 0.92]	Not reported as OR
Esophageal intubation, OR	0.23 [0.04, 1.15]	Not reported as OR

*Hansel 2022[1]; OR, Petos odds ratio; RR, risk ratio.

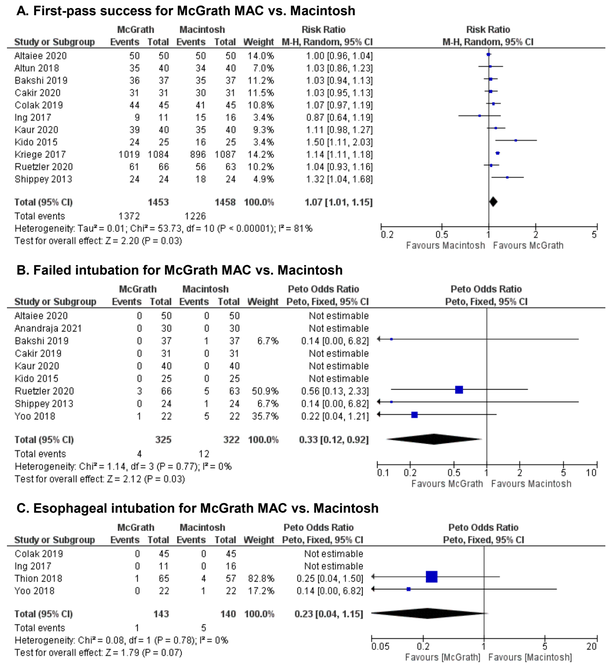

Figure 2. Meta-analysis outcomes including studies comparing McGrath MAC VL with Macintosh DL for (A) first-pass success, (B) failed intubation, and (C) esophageal intubations. The diamonds in each forest plot represent the total estimate where the mid points are the averages and the extremities indicate the confidence intervals.

Results

- Compared with the 21 studies originally included in the Cochrane review, we excluded seven of these RCTs because two used a mix of VLs, two were not for perioperative care, two used McGrath series 3 or 5, and one was retracted.
- We included **14 RCTs** with **3,137 patients** (1,570 using McGrath MAC).
- **FPS was significantly improved** using McGrath MAC in comparison to Macintosh (RR 1.07, 95% CI 1.01 – 1.15) and the RR was similar to that reported in the Cochrane review (Table 1, Figure 2A).
- In addition, the use of McGrath MAC led to a **significant reduction in failed intubations** (OR 0.33, 95% CI 0.12 – 0.92) and a non-significant reduction in oesophageal intubations (Table 1, Figure 2B & C).
- To put this into context a hospital with:
  - ...an FPS of 85% with Macintosh, could expect FPS to increase to 91%.
  - ...a failed intubation rate of 3% with Macintosh, could expect this to drop to 1%.
- There were insufficient data to report results on dental trauma or hypoxemia.
- In a leave-one-out analysis, results were not substantially impacted by any one study.

Conclusion

- In keeping with the findings of the 2022 Cochrane review, in perioperative care, **FPS is higher with McGrath MAC** in comparison to Macintosh DL and **failed intubation is less common**.
- To determine the clinical significance, real-world data, a larger RCT, or a network meta-analysis would be useful.

References

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