Evaluation of the TotalTrack® Video Laryngeal Mask

A New Option in Airway Management: Evaluation of the TotalTrack® Video Laryngeal Mask

Janine Choonoo,[1] Ross Hofmeyr,[2] Niall Evans,[3] Mike James,[4] Nicholas Meyersfeld[3]

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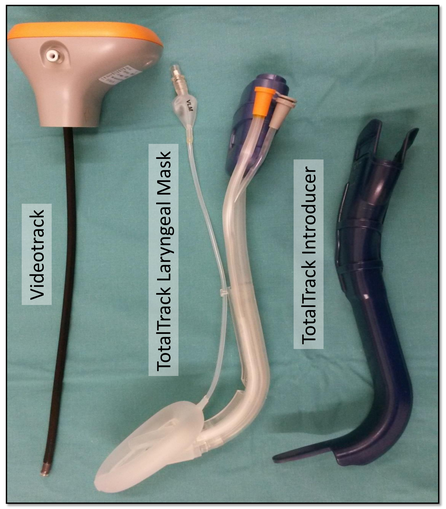
Introduction

The TotalTrack® Video Laryngeal Mask (VLM) (Medcom Flow, Barcelona) is a novel airway device which combines a disposable intubating laryngeal mask with a reusable video system (Videotrack®), enabling tracheal intubation under video guidance with minimal interruption in ventilation.

The device incorporates a supraglottic airway with power pack and isolation channel (for the LED light source, video camera and display), rigid introducer, supraglottic suction port, nasogastric tube conduit, and a channel to allow loading of the pre-selected tracheal tube.

The TotalTrack® VLM has been proposed for multiple uses, however, no objective documentation of the efficacy of this device existed at the time of initiation of our study.

We evaluated the device in 60 patients under general anaesthesia with neuromuscular blockade. Primary outcomes were laryngeal mask seal pressures, and success rate of tracheal intubation through the device.



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Methods

Departmental and institutional ethics approval was granted to recruit 60 adult patients with written informed consent into a prospective, descriptive study. Sample size was balanced between adequacy of descriptive statistics and reduction in risk from a new device. Three investigators with more than 5 years anaesthetic experience were trained in the use of the TotalTrack.

Inclusion Criteria	Exclusion Criteria
ASA 1 or 2	ASA 3 or greater
Age > 18 years	Inability to provide consent
Lean body mass 50 – 80 kg	Predicted difficult airway
Elective surgery of 30 – 120 minutes duration	Contra-indication for a supraglottic airway

At least two investigators performed each case with a standardised general anaesthetic technique with neuromuscular blockade. Time taken for insertion until effective ventilation occurred was documented. Leak testing was performed using manometric stabilisation techniques immediately after insertion and throughout a series of head manoeuvres (flexion, extension and 30° rotation from midline).[1] Thereafter, maximal inflation pressures were determined, with a limit of 40 cmH_2O. Haemodynamic variables and oxygen saturations were documented at 2.5 minute intervals. The view of the glottic opening was documented using the Cormack-Lehane grading and percentage of glottic opening (POGO) score.

Tracheal intubation was timed from tracheal tube cuff deflation to cuff re-inflation. No more than two attempts at intubation were allowed. Once complete, the SGA cuff was deflated and the device left in-situ to allow later assessment. A 12F nasogastric tube was inserted via the dedicated port and confirmed by insufflation of air during auscultation over the epigastrium.

After completion of surgery, the Videotrack was reinserted, and presence of supraglottic secretions assessed. If present, the supraglottic suction port was tested. The tracheal tube was removed once the patient had achieved adequate neuromuscular reversal. Vocal cord movement was assessed using the Videotrack. The device was subsequently removed when patients regained conciousness, and soiling of the device was documented.

Patients were followed up prior to discharge from the recovery room, and 24 hours later, to assess for the presence of adverse effects.

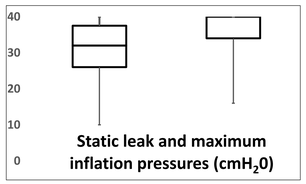
Acknowledgments & Conflicts of Interest

The authors wish to acknowledge MedCom Flow (Barcelona, Spain) and Consept Medical (Cape Town, South Africa) for donation of the materials to perform the trial. There are no conflicts of interest to declare.

Results

Patient Demographics & Airway Assessment	Mean (SD)	Range
Age (yrs)	41 (14)	18 - 73
Height (kg)	71 (14)	42 – 101
Height (cm)	167 (10)	145 – 189
BMI ($kg.m^{-2}$)	25 (5)	14 – 34
Neck Circumference (cm)	37 (3)	31 – 47
Characteristic	**Numbers (%), N=60**	
Gender	Male: 23 (38%); Female: 37 (62%)	
ASA Class	I: 24 (40%) II: 36 (60%)	
Mallampati Grade	1: 37 (62%), 2: 17 (28%), 3: 6 (10%), 4: 0 (0%)	
Thyromental Distance	< 6 cm: 1 (1.6%), ≥ 6 cm: 59 (98.3%)	

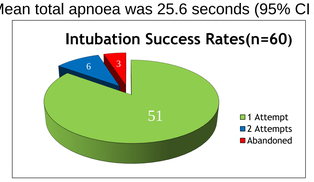
Insertion and ventilation was successful in 98.3% (59/60). Mean time to adequate ventilation was16.8 seconds (range 4.0–52.0, SD 10.8). Insertion failed in one case. One patient desaturated to 92% during insertion. Median static leak and maximal inflation pressures of the laryngeal mask component were 32 cmH_2O (range 10.0 - 40.0) and 40 cmH_2O (range 16.0 - 40) respectively.



Median leak 32 cmH_2O

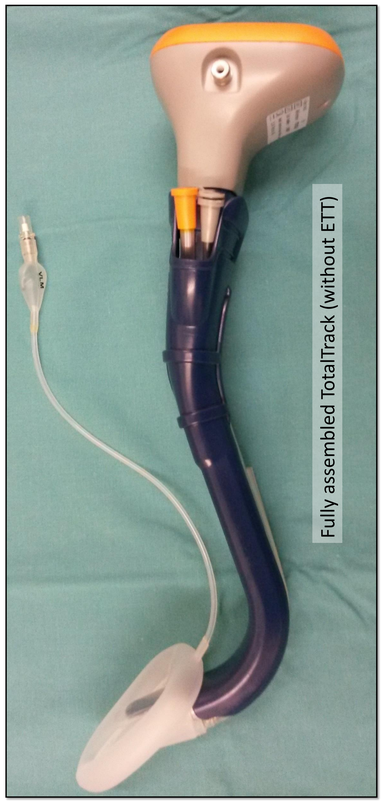
NB: Peak pressures limited to 40 cmH_2O

Glottic view was possible in 59/60 cases. Tracheal intubation was successful in 95% (57/60), with a first attempt success rate of 86%. Mean intubation time was 9.5 seconds (95% CI 14.0–19.7/SD 10.8). In two cases, tracheal intubation was not achieved in two attempts. The need for repositioning to gain appropriate view occurred in 25%. Mean total apnoea was 25.6 seconds (95% CI 20.4–30.9/SD 19.9).



Overall success
Ventilation = 98 %
Intubation = 95%

Gastric tube insertion was successful in 91%. Supraglottic secretions were present in 79%, and the suction port effective in 91%. Vocal cord assessment was possible in 75%. Where the cords were not visualised, the majority had secretions on the interior of the mask, obscuring the view on the VideoTrack®. No soiling of the device in 77%. On the day of procedure, 35% reported sore throat, 15% dysphagia and 8.3% hoarseness. At 24 hours 21% still experienced sore throat, 8.3% had dysphagia and 11.6% were hoarse.



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This poster and the full reference list are available for download at www.openairway.org/wamm-totaltrack-poster or by scanning these QR codes:

References

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Discussion

The TotalTrack® VLM enables supraglottic ventilation, video-assisted laryngoscopy and intubation, as well as nasogastric tube placement and supraglottic suctioning. It is quickly and easily inserted, with only one failure in placement in our study due to the device folding over. The supraglottic component resembles similar second generation devices, and the seal pressures generated by the TotalTrack® VLM are comparable to those published for the gold standard LMA Proseal™.[2-7] These seal pressures demonstrate that the TotalTrack VLM functions well as a supraglottic airway.

The TotalTrack® VLM is also a video intubating laryngeal mask. Whilst the current gold standard for intubating laryngeal masks is the LMA-Fastrach™, the TotalTrack is most comparable to the LMA-CTrach™ due to its video capabilities. The LMA Fastrach™ has been widely assessed, with studies showing intubation success rates ranging from 70% to 100%.[8-12] The CTrach™ has reported tracheal intubation success rates between 89.7% and 96%.[13-15] A direct comparison of the LMA Fastrach™ and the CTrach™ by Lui, Goy, Lim and Chen showed an overall intubation success rate of 96% for the Fastrach and 100% for the CTrach™.[15] In a smaller study of morbidly obese patients, intubation was equivalent in both the CTrach™ and the LMA Fastrach.[16] Our study revealed a similar rate.

Although no ventilation occurs during placement of the TotalTrack®, ventilation can continue during positioning for intubation. Total apnoea time was calculated from the insertion and intubation times. In the study by Goy *et al* the insertion times of the laryngeal mask component averaged 23 and 25 seconds, and tracheal intubation times averaged 100 seconds and 116 seconds for the Fastrach™ and Ctrach™ respectively.[15] Thus, the short total apnoea time for the TotalTrack® may be advantageous.

Assessment of haemodynamic parameters during intervention of insertion and tracheal intubation displayed no clinical significant changes. Patient reported side-effects, while concerning on the operative day, had diminished at the 24 hour follow-up. The incidence of these correlate with the reported rates for other supraglottic devices in the literature.[6, 17-20] Larger studies will have to be completed to assess safety and side effect profiles more thoroughly.

Another recently-published series found similar results in obese patients.[21] Comparative clinical trials must now focus on the device in predicted difficult airways.

Conclusion

The TotalTrack® VLM is a **novel disposable intubating laryngeal mask** which allows for **tracheal intubation under constant vision with minimal interruption of ventilation**. This provides clinicians and patients with additional safety by minimising total apnoea time and potential injury to the airway. **In our small series, it functions well as a supraglottic airway with a good intubation success rate.**

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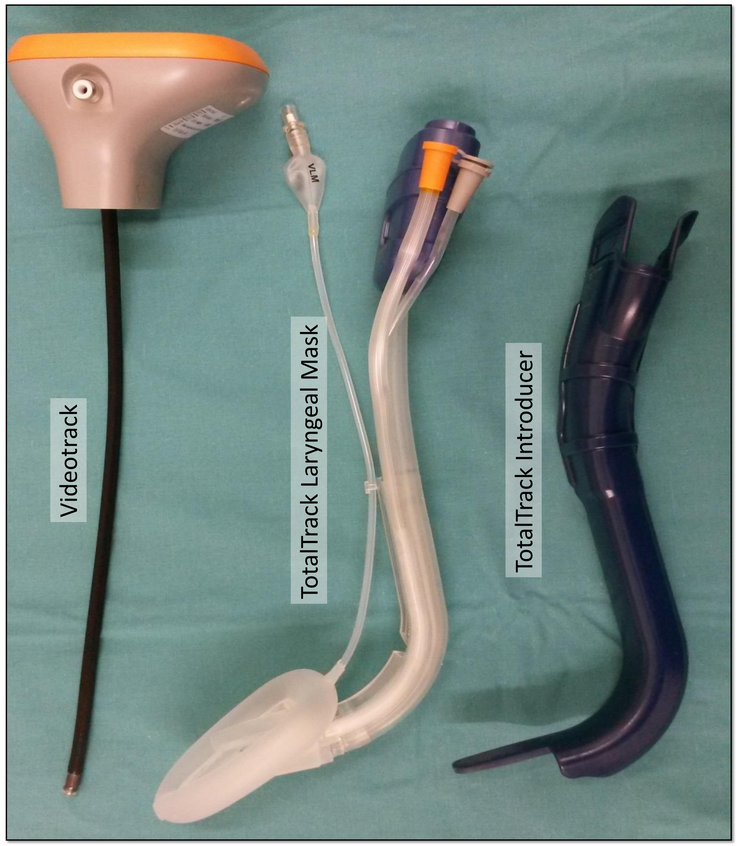
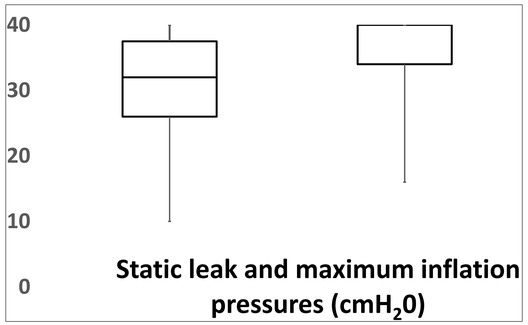


- Novel disposable intubating laryngeal mask
- Allows for tracheal intubation under constant vision with minimal interruption of ventilation. Minimises total apnoea time and potential injury to the airway.
- Functions well as a supraglottic airway with a good intubation success rate.



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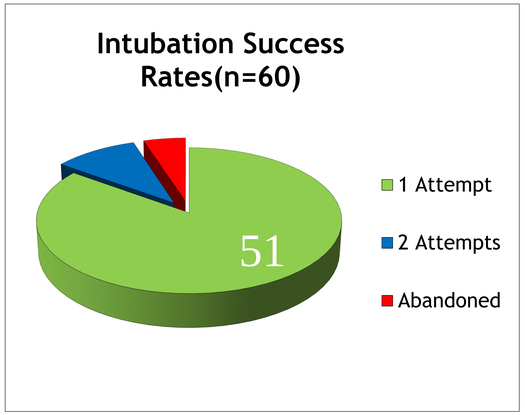

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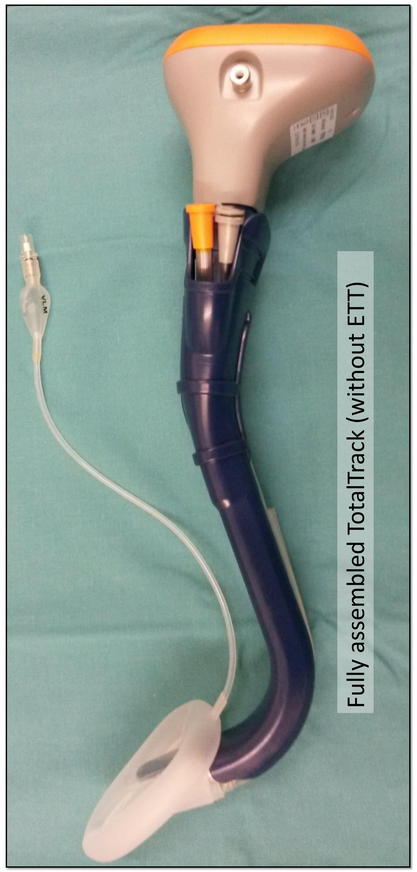

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