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Success of Tracheal Intubation with Intubating Laryngeal Mask Airways

A Randomized Trial of the LMA Fastrach™ *and* LMA CTrach™

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Background: The *LMA CTrach*™ system (The Laryngeal Mask Company, Singapore) is a development of the *LMA Fastrach*™ system (The Laryngeal Mask Company, Singapore), with integrated fiberoptic bundles and a detachable liquid crystal display viewer. This randomized study of 271 patients compared tracheal intubation with these two systems.

Methods: In both groups, ventilation was optimized after insertion of the laryngeal mask conduit before proceeding further: intubation with the *LMA Fastrach*™, and optimizing the conduit placement and view and then intubation with the *LMA CTrach*™. The first-attempt and overall success rates of tracheal intubation, and the times required, were recorded.

Results: Tracheal intubation was successful on the first attempt in 93.3% of patients with the *LMA CTrach*™ and 67.9% of patients with the *LMA Fastrach*™ ($P < 0.001$). The success rates within three attempts were 100% with the *LMA CTrach*™ and 96.4% with the *LMA Fastrach*™ ($P = 0.06$). The median (interquartile range) time for the complete tracheal intubation process was 116 (82–156) s with the *LMA CTrach*™ and 100 (74–121) s with the *LMA Fastrach*™ ($P = 0.002$). There was no correlation between the grade of conventional laryngoscopy and success of intubation with either system.

Conclusions: The ability to view the glottis and optimize placement of the *LMA CTrach*™ under vision enabled a higher first-attempt success rate of tracheal intubation with the *LMA CTrach*™. However, more time is required with the *LMA CTrach*™, there are failed views in some patients, and its cost effectiveness remains unclear.

THE *LMA Fastrach*™ (also termed the *Intubating Laryngeal Mask Airway*™; The Laryngeal Mask Company, Singapore) enables ventilation and provides a conduit for blind tracheal intubation.[1,2] Since its introduction in 1997, the *LMA Fastrach*™ has been shown to be very in management algorithms has been validated.[3–5] However, blind tracheal intubation with the *LMA Fastrach*™ frequently fails despite corrective maneuvers and multiple attempts at intubation.[6,7] The success of tracheal intubation on the first attempt was only 80% in a study of 500 subjects.[6]

The *LMA CTrach*™ system (The Laryngeal Mask Company, Singapore), a new modification of the *LMA Fastrach*™, consists of a *LMA CTrach* Airway™ and a detachable *LMA CTrach* Viewer™. The *LMA CTrach*™ has fiberoptic channels to convey light from and images to the liquid crystal display viewer. This system enables viewing of the glottis, alignment of the laryngeal mask conduit with the glottis, and tracheal intubation under vision, and may increase first-attempt success in airway rescue situations.[8–10] Our hypothesis is that such visualization improves the first-attempt success rate of tracheal intubation through a laryngeal mask conduit. In this randomized study, we compared the success rates of tracheal intubation between the *LMA Fastrach*™ and the *LMA CTrach*™ to evaluate the impact of visualization.

Materials and Methods

We obtained approval from the institutional review boards of the National University Hospital, National Healthcare Group, Singapore, and the KK Women's and Children's Hospital, Singapore. We obtained written consent from all patients involved in this study. We