Response to: Prehospital Surgical Cricothyrotomy in a Ground-Based 9-1-1 EMS System: A Retrospective Review

Kaelan Gobeil Odai, MD

McGill University Health Centre, Montreal, Quebec, Canada

Correspondence:
Kaelan Gobeil Odai, MD
2214 rue De Villiers
Montreal, Quebec, Canada H41 1L5
E-mail: Dr.k.gobeilodai@outlook.com

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To the Editor,

The study entitled "Prehospital Surgical Cricothyrotomy in a Ground-Based 9-1-1 EMS System: A Retrospective Review"[1] has been read with interest and the following commentary is offered.

Firstly, it is important to address the goals of this study which are two-fold. The first goal was to assess the indications for surgical cricothyrotomy. The indications listed are many, but the one that is questionable is that of "trismus." The authors fail to mention the cause of trismus or if it was addressed through non-surgical means. Importantly, if trismus was caused by absent or failed paralysis, it raises the question as to why the standard of care of rapid sequence intubation strategy[2,3] was not used.

The second outcome the authors purport is cricothyrotomy success implied as being correct endotracheal tube placement as evidenced by $ETCO_2$ waveform capnography. The authors' definition of a successful cricothyrotomy is arguably dubious. Namely, it is understood that decompensated airway management success is not solely defined by the correct placement of the endotracheal tube, but also by the subsequent clinical response of the patient and complications arising from the procedure.[4–6] The authors fail to mention the clinical response, whether positive or negative, to the aforementioned procedure. Moreover, they omit any data pertaining to complications arising from this procedure: catastrophic bleeding, esophageal perforation, thyroid injury, nerve injury, aspiration pneumonia, etc.

From an outcome perspective, the presented data appear to be spurious at best. The greatest indication for cricothyrotomy provided, trismus, a treatable condition, was managed with a high-risk surgical procedure in a limited-resource setting, without the provision of data to support that any rescue methods were used. Concerningly, these data point to a degree of recklessness that could have catastrophic outcomes for patients. The constraints of correct endotracheal tube placement as a marker of success reinforces concerns pertaining to danger of this procedure in a prehospital setting. The lack of reported safety data or patient outcome data make the authors' definition of success questionable. Arguably, it is difficult for a procedure to be successful if its execution is correct but nonetheless maims or kills the patient.

Methodologically, there are lacunae in the authors' reporting. Regarding the intubation events, the authors fail to mention the experience of the operator. This introduces a significant amount of bias. Heuristically, more experienced clinicians, advanced paramedic crews, or physicians on crews would likely have a higher success rate in intubating difficult airways than a junior trainee.[7] Ergo, the rate of cricothyrotomy, a last-resort measure to restore oxygenation and ventilation, would likely be affected.

Finally, the reported need for surgical airways whatsoever is quite questionable. While an important skillset to have, cricothyrotomies are considered a last resort effort to manage a failed airway. At no point do the authors address if the first step of airway management, effective bag-valve-mask (BVM) ventilation, was used; nor was there mention of oral/nasal stenting devices. To the authors' credit, they do address the use of supraglottic airway devices. However, the authors fail to address why such a good "can't intubate" rescue device[8,9] was only used on 39% of patients. Moreover, it is very worrisome that endotracheal intubation was not attempted on 42% of patients who were subjected to a surgical airway. This is especially concerning given that cricothyrotomies are done in "Can't intubate, Can't oxygenate" scenarios,[10,11] putting into question the necessity of this

procedure. Finally, the patient population that was used in this study is problematic as 84% were in cardiac arrest with no defined cause. Notably, of all patients in cardiac arrest included in this study, 68% of those were already arrested upon the arrival of the paramedics. No indication is provided by the authors that these cardiac arrests were due to hypoxia secondary to upper airway obstruction, that could not be resolved with intubation, therefore requiring an emergent cricothyrotomy. Since resuscitation efforts were terminated in 48% of the cardiac arrest patients, it is arguable that performing a surgical airway in an effectively deceased patient that was not optimally managed to begin with is to their detriment and not their benefit.

These data, taken together, appear to paint a far different conclusion than that of the original authors. They demonstrate that a critical and dangerous procedure is done principally in an inappropriate patient population, or in sub-optimally managed patients. The lack of reported safety or outcome data make all conclusions of success for this procedure void. Undoubtedly, the authors are correct that prehospital clinicians must have at their disposal a varied array of tools to manage decompensated airways. However, these data support the very ominous and worrisome conclusion that prehospital Emergency Medical Services crews are overzealous and far too cavalier in the management of the decompensated airway.

References

1. Lulla A, Dickson R, Wells M, Gilbert M, Rogers Keene K, Patrick C. Prehospital surgical cricothyrotomy in a ground-based 9-1-1 EMS system: a retrospective review. *Prehosp Disaster Med.* 2024. Online ahead of print.
2. American College of Emergency Physicians (ACEP). Drug-assisted intubation in the prehospital setting. Policy statement. *Ann Emerg Med.* 2011;58(1):113–114.
3. Stewart JC, Bhananker S, Ramaiah R. Rapid-sequence intubation and cricoid pressure. *Int J Crit Illn Inj Sci.* 2014;4(1):42–49.
4. Caruana E, Duchateau FX, Cornaglia C, Devaud ML, Pirracchio R. Tracheal intubation related complications in the prehospital setting. *Emerg Med J.* 2015; 32(11):882–887.
5. Divatia JV, Khan PU, Myatra SN. Tracheal intubation in the ICU: life saving or life threatening? *Indian J Anaesth.* 2011;55(5):470–475.
6. Rosenberg H, Hendin A, Rosenberg E. Just the facts: post-intubation sedation in the emergency department. *CJEM.* 2020;22(6):764–767.
7. Crewdson K, Lockey DJ, Røislien J, Lossius HM, Rehn M. The success of pre-hospital tracheal intubation by different pre-hospital providers: a systematic literature review and meta-analysis. *Crit Care Lond Engl.* 2017;21(1):31.
8. Singh K. Second Generation Supraglottic Airway (SGA) Devices. In: A. Shallik N, (ed). *Special Considerations in Human Airway Management*. London, United Kingdom: IntechOpen; 2021.
9. Zhang K, Zhou M, Zou Z, Zhu C, Jiang R. Supraglottic airway devices: a powerful strategy in airway management. *Am J Cancer Res.* 2024;14(1):16–32.
10. Kwon YS, Lee CA, Park S, Ha SO, Sim YS, Baek MS. Incidence and outcomes of cricothyrotomy in the "cannot intubate, cannot oxygenate" situation. *Medicine (Baltimore).* 2019;98(42):e17713.
11. McKenna P, Desai NM, Tariq A, Morley EJ. *Cricothyrotomy*. Treasure Island, Florida USA: StatPearls Publishing; 2024.

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