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Case Study

Emergency Front of Neck Surgical Airway in the Emergency Department: Lessons Learnt

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Abstract

Securing the airway is a fundamental principle in the resuscitation of critically ill patients, as it directly influences the patient's ability to breathe and sustain life. Various national and international guidelines emphasise that airway management should take precedence over both breathing and circulation in a single-rescuer scenario, underscoring the critical nature of this step in emergency care. In this article, it presents a case involving a patient who faced a challenging airway scenario. Despite attempts at conventional intubation, including video-assisted intubation and bronchoscopy, these methods failed to secure the airway. This prompted the need to pursue a more advanced, interventional approach: the surgical airway. This procedure, while more invasive, proved essential for ensuring the patient's survival. Through this case, it aims to highlight the importance of preparedness and flexibility in airway management, particularly in high-risk environments like the emergency department. The lessons learned from this scenario reinforce the need for healthcare providers to be well-trained in both basic and advanced airway management techniques. Additionally, it underscores the significance of timely decision-making and the ability to adapt when standard methods are not effective. By sharing this case, that hope to contribute to a broader understanding of the critical role that surgical airways can play in emergency care and enhance the collective knowledge and preparedness of emergency medical teams.

Keywords: *Emergency Medicine; FONA; Front of Neck Airway; Surgical Airway*

Introduction

The "cannot intubate, cannot oxygenate" (CICO) scenario is a rare but life-threatening event in airway management, representing one of the most critical emergencies a clinician can encounter (Cook *et al*., 2011). Immediate and decisive intervention is crucial in securing the patient's airway, and in many cases, emergency front-of-neck access (eFONA) becomes the definitive method of securing the airway, as recommended by the Difficult Airway Society (DAS) algorithm (Frerk *et al*., 2015). While CICO situations are relatively uncommon, they carry significant risks, and clinicians must be prepared to respond rapidly and efficiently. This is particularly challenging in patients who have previously undergone neck surgeries, such as thyroidectomy, where anatomical alterations can complicate airway management (Apfelbaum *et al*., 2015). These prior surgical interventions create additional hurdles, requiring a high level of expertise in airway anatomy and management to avoid disastrous outcomes. CICO cases, though rare, demand an unwavering ability to act swiftly, as any delay or misstep can lead to catastrophic consequences (Chrimes, 2010).

This case report highlights the critical importance of recognising the signs of a CICO situation early, adhering to established airway management protocols, and executing eFONA when necessary. In

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addition to emphasising the role of prompt recognition and management, the case underscores the significance of training in performing eFONA proficiently in high-stress, unanticipated difficult airway scenarios. The goal of this report is not only to stress the need for vigilance in identifying such emergencies but also to reinforce the importance of preparedness and adherence to established airway management algorithms to ensure patient safety and optimal outcomes.

Case Description

An 85-year-old female patient presented to the emergency department under critical conditions. She lived independently and had a medical history significant for diabetes and hypertension, both of which were under ongoing treatment. In addition to her chronic conditions, she had undergone a thyroidectomy 20 years ago and a left mastectomy 10 years ago, with no current follow-up or management related to these previous surgeries. Prior to the incident, the patient was reported to be in her usual state of health, having no significant complaints. However, while waiting for transport to the hospital with her sister, she suddenly experienced a seizure-like episode. The family promptly sought medical attention, and upon arrival at the hospital, the patient was found to be in asystole, with no detectable pulse.

Immediately, cardiopulmonary resuscitation (CPR) was initiated according to protocol. After performing three cycles of CPR, there was a return of spontaneous circulation (ROSC), and a pulse became palpable, offering a brief moment of hope. Despite these efforts, the situation remained critical as the patient's oxygen saturation levels remained dangerously low. Initial attempts to ventilate the patient with a bag-valve-mask (BVM) device were unsuccessful, and her SpO_2 levels remained critically low, fluctuating between 70-80%, a condition that indicated inadequate oxygenation.

In response to the deteriorating clinical picture, the team began efforts to secure the airway using a bougie and a video laryngoscope. Despite these attempts, the airway remained inaccessible, and subsequent attempts to insert a laryngeal mask airway (LMA) were also unsuccessful. Recognising that this had evolved into a "cannot intubate, cannot oxygenate" (CICO) scenario, the medical team made a critical decision to perform emergency front-of-neck access (eFONA), which was executed promptly and successfully. This procedure allowed the team to establish a secure airway and continue efforts to resuscitate the patient.

However, despite the successful airway management, the patient's condition continued to worsen. She developed persistent hypotension, bradycardia, and eventually reverted back into asystole. Repeated rounds of CPR were performed, but unfortunately, the patient's condition did not improve. After the final resuscitation attempt failed, the patient was pronounced dead.

This case highlights several crucial elements in emergency airway management. First, it emphasises the importance of quick recognition and action in the context of a CICO situation, particularly in a patient with prior neck surgeries, which can complicate airway management. The case also illustrates the necessity of having a well-practiced team familiar with advanced airway techniques such as eFONA. Despite the prompt intervention and technical success in securing the airway, the patient's underlying critical condition, along with other factors such as age and comorbidities, contributed to the final outcome.

Discussion

Emergency front-of-neck access (eFONA) is a critical procedure used to secure a patent airway in emergency situations, particularly when conventional airway management techniques fail. The goal of eFONA is to facilitate emergency alveolar oxygenation by creating an artificial airway via the anterior neck, ensuring that the patient can receive adequate ventilation when other methods have proven unsuccessful (Price & McCoy, 2019). One of the primary indications for eFONA is the occurrence of difficult or failed tracheal intubation (Galway *et al*., 2023). In many cases, the presence of visible scar tissue or other anatomical distortions in the anterior neck may provide a clue to possible airway complications caused by previous surgical interventions, even when there is no prior history of difficult

intubation (Oh, 2019). These anatomical changes can complicate the airway management process, and eFONA becomes a necessary intervention.

To improve the likelihood of success in securing the airway, the use of an adequate dose of short-acting neuromuscular blocking agents can be beneficial. These agents help to facilitate the return of spontaneous respiratory function in a short duration, allowing clinicians to reduce the number of airway interventions and prepare more effectively for the eFONA procedure. Additionally, visualising the larynx with a video laryngoscope following an initial failure of tracheal intubation via direct laryngoscopy can significantly decrease the chances of failure in subsequent intubation attempts. This technique is especially helpful in patients with a predicted difficult airway (Lewis *et al*., 2019).

The scalpel-finger-bougie approach for emergency cricothyroidotomy, as illustrated in Figure 1, is one of the recommended techniques for eFONA and is widely endorsed by international airway management guidelines as the first-line method. The procedure should be performed by the most experienced clinician available, ideally with the assistance of at least one other trained team member who is familiar with the technique. This ensures both the expertise and the necessary support for a successful intervention.

When performing eFONA, it is crucial to select the appropriate size of the oral endotracheal tube (ETT), as the use of a tube that is too long can result in deep insertion and inadvertent intubation of the right main bronchus. To prevent this, the tube should be sized to fit snugly within the trachea, and it should be advanced carefully until the ETT balloon is no longer visible. This minimises the risk of complications, such as improper placement or damage to the airway structures, while optimising the patient's chances of recovery.

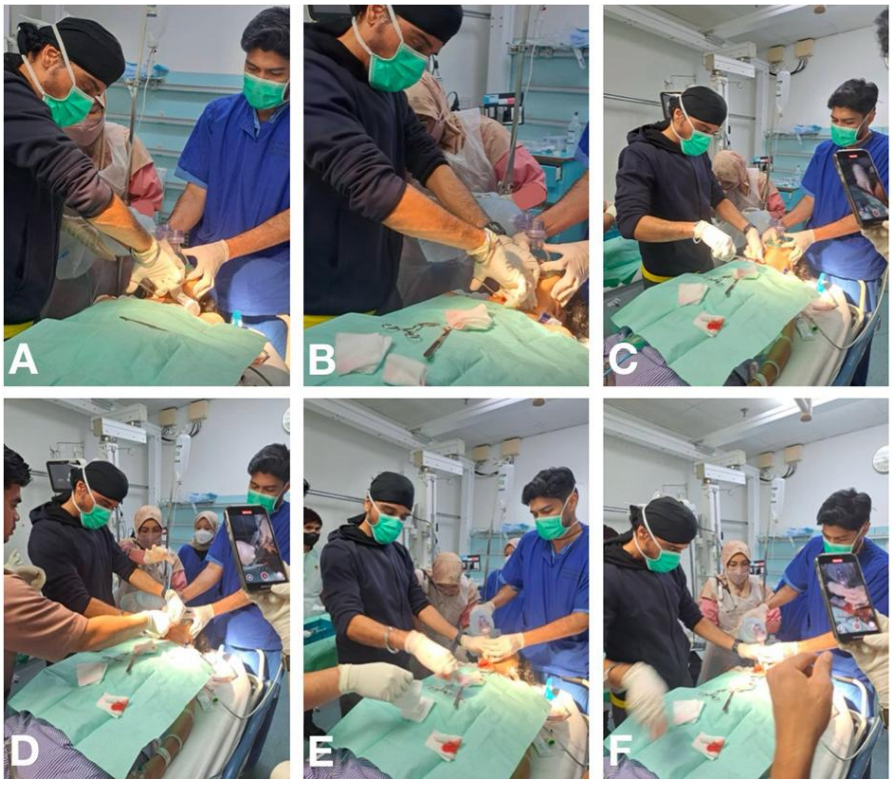

Figure 1: Scalper-finger-bougie technique of emergency cricothyroidotomy

Conclusion

Airway assessment is a critical component of care for patients presenting to the emergency department (ED), where the timely and accurate identification of potential airway difficulties is essential. Early recognition of a difficult airway can significantly improve patient outcomes, though this process is often

complicated by the time-sensitive, high-pressure environment of the ED, where thorough pre-assessment may be limited. While major airway events requiring emergency front-of-neck access (eFONA) are rare, the decision to proceed with this procedure must be made swiftly once the indications are identified. As such, it is imperative that all emergency physicians are not only capable of recognising these situations but are also proficient in performing eFONA when necessary. Following the successful establishment of the airway and stabilisation of the patient, a clear plan for transitioning to a definitive airway should be implemented to ensure continued respiratory support. The surgical airway is often viewed as a last-resort option for managing a difficult airway, but in certain cases, it may be the best initial approach. For patients at high risk, such as those with a previous neck surgery scar, presenting with a challenging airway, the surgical airway could, in some instances, be the first-line intervention. This highlights the importance of not only anticipating such scenarios but also having surgical airway equipment readily available as part of the emergency airway management toolkit.

In the future, ongoing research and training will likely further refine when and how surgical airway methods should be employed. It is crucial to always have surgical airway equipment prepared in cases where it may be needed. The presence of a senior medical officer or an emergency medicine-trained specialist is essential to provide support during these critical procedures. The first-pass intubation attempt should be followed by an immediate surgical airway if there is any indication of failure to pass the endotracheal tube, rather than continuing with multiple intubation attempts, as this increases the risk of further complications. Moving forward, it is anticipated that advanced airway training will become even more specialised, with a focus on optimising first-pass success rates and improving decision-making processes. The surgical airway must always be performed by the most experienced physician available, and in situations where the emergency physician holds the most expertise, they should lead the airway management process. The scalpel-finger-bougie technique, a rapid and effective method for securing the airway surgically, ensures that the patient remains within the apneic window, providing the best chance of survival. As the practice of emergency airway management evolves, continuous improvements in training, equipment, and procedural protocols will ensure better preparedness for managing complex airway challenges in the future.

Conflict of Interest

The authors affirm that there are no conflicting objectives.

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