

Overcoming cognitive barriers in a CICO emergency: situational awareness and the lone responder

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Dear Editor,

The “cannot intubate, cannot oxygenate” (CICO) scenario remains a challenging situation in airway management, particularly in “spoke” hospitals where the anaesthesiologist often operates as the sole expert in advanced airway techniques. In such isolated environments, the absence of immediate backup places substantial cognitive demands on the clinician. While technical guidelines provide a structured framework, the successful transition from failed intubation to a surgical airway is frequently hindered by human factors and cognitive biases. We report a successful emergency front-of-neck airway (eFONA) in a patient with massive lingual haemorrhage, emphasising that the “decision to cut” is as much a matter of situational awareness and soft skills as it is of technical proficiency.

A 50-year-old man was admitted to the emergency department after a generalised tonic-clonic seizure. On arrival, he suffered a recurrent seizure with severe tongue biting, resulting in massive arterial haemorrhage and rapidly developing macroglossia. Despite aggressive suctioning, complete airway obstruction developed, leading to severe hypoxia and extreme psychomotor agitation. Recognising a peri-arrest state, we decided on immediate rapid sequence induction using fentanyl (100 µg), ketamine (100 mg), midazolam (5 mg), and rocuronium (100 mg). Direct laryngoscopy confirmed a “wet airway” filled with blood and oedematous tissue, with no anatomical landmarks identifiable (Cormack-Lehane grade 4).

In this high-stress environment, maintaining situational awareness was critical. The anaesthesiologist had to recognise the futility of further attempts at visualisation while managing the psychological pressure of the impending cardiopulmonary arrest. The team declared a CICO state and proceeded to surgical access within 30 seconds of the failed laryngoscopy. Using the “scalpel-finger-bougie” technique [1], a transverse incision was made over the cricothyroid membrane. Despite the distorted anatomy, the membrane was identified by tactile feedback, and digital palpation was used to maintain airway access; a gum-elastic bougie was then passed, followed by a 6.0 mm cuffed endotracheal tube. The procedure was completed in less than 60 seconds, rapidly restoring oxygenation (SpO₂ from 30% to 98%) (Figure 1).

The management described aligns with the algorithmic approach outlined in the Difficult Airway Society (DAS) 2025 guidelines, which retain the linear Plan A-D structure culminating in eFONA while shifting the emphasis from the management of failure towards the maximisation of success and prevention of fixation [2]. These principles also apply to the critically ill patient, for whom dedicated guidance on emergency tracheal intubation has been developed [3]. Consistent with both the DAS 2015 and 2025 recommendations, scalpel cricothyroidotomy was used as the default eFONA technique [1, 2]. In our patient, the cricothyroid membrane could not be identified by surface anatomy because of macroglossia and haemorrhagic

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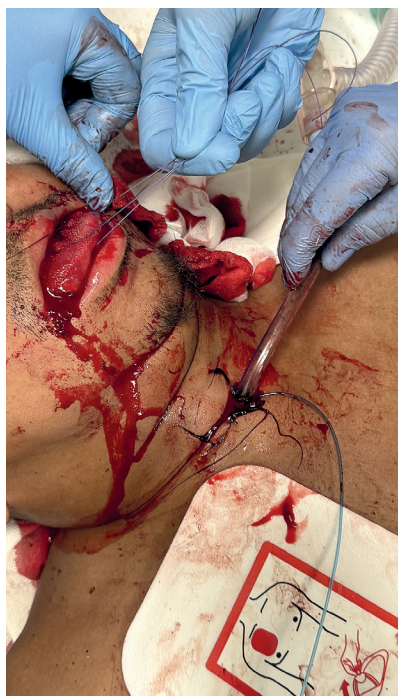


FIGURE 1. Post-procedural view showing the cuffed tube secured in the neck and the marked swelling and traumatic injury of the tongue

distortion; identification was therefore achieved through tactile feedback and digital palpation, representing an adaptation of the recommended technique when the laryngeal handshake is unreliable. Notably, the DAS 2025 update also addresses human factors and point-of-care ultrasound as distinct guideline domains, reflecting the increasing recognition of non-technical factors alongside technical proficiency in contemporary airway management [2].

The principal challenge in this case may have been cognitive rather than purely technical. Human factors are now recognised as central to airway disasters: structured analysis of cases reported to the Fourth National Audit Project (NAP4) identified deficits in situational awareness – failures to anticipate deterioration and delayed or incorrect decisions – as the single most frequent contributory category [4, 5]. Several well-described cognitive biases may contribute to the failed-intubation scenario: the sunk-cost bias sustains repeated laryngoscopy attempts because effort has already been invested; the omission bias favours inaction over a committed, irreversible inter-

vention; and task fixation narrows attention onto the glottis at the expense of the deteriorating patient [6]. In-depth, interview-based analyses of real airway emergencies have mapped these decision pathways and the cognitive barriers that may obstruct them [7, 8]. Applying cognitive task analysis to experienced clinicians' accounts, this work locates the decisive difficulty less in any individual technique than in the transition between them, and identifies recognition-primed decision-making as a key mechanism: experienced anaesthetists rapidly select the action matching the cues they recognise, although this reliance on familiar patterns may contribute to fixation when an uncommon CICO scenario is not immediately recognised [9]. The proposed remedy is not simply more training to overcome psychological barriers, but the combined redesign of the environment and training to support decision-making under stress, improving the visibility of the cues – through cognitive aids and explicit declaration of the CICO state – that signal this rare, time-critical emergency [9]. The “decision to cut” therefore requires the clinician to recognise and act on these cues despite extreme physiological and psychological stress. Real-time cognitive aids are designed to address precisely this gap: the Vortex Approach provides a visually structured framework intended to support decision-making under cognitive overload and explicitly prompts timely transition to eFONA [10]. Simulation evidence has shown that displaying cognitive aid can improve non-technical skills during a simulated CICO crisis [11].

Beyond the decision to initiate eFONA, cognitive barriers may impede its execution: the technique is rare, invasive and irreversible, and the operator may delay because of uncertainty about whether it is justified. The explicit, spoken declaration of a CICO state is therefore pivotal – it functions as the cognitive “permission” to proceed and, for the lone responder, may need to be self-generated [10].

To make this pattern reproducible and teachable, we propose an explicit decision algorithm (Figure 2) in which continuous reassessment of the situation runs in parallel with the technical sequence. At every step the operator must ask a single, decisive question: is this failure technical, or does it reflect the clinical situation itself? A technical problem warrants an optimised attempt at the next lifeline, but when the situation – not the technique – makes further attempts futile, persisting only consumes time and accelerates hypoxic cardiac arrest. In our patient, macroglossia and ongoing haemorrhage rendered supraglottic rescue unlikely to be effective because of the distorted anatomy, and recognising this permitted an immediate transition to surgical access. The essential discipline is to remain attentive to the patient's overall condition and trajectory rather than being drawn into a spiral of repeated attempts; it is this whole-patient situational awareness, maintained while acting, that signals when to abandon further airway attempts and proceed to eFONA.

These considerations are amplified for the lone responder in a spoke hospital. Crisis resource management and cognitive aids such as the Vortex are primarily designed for team-based environments in which clinicians can share a mental model, distribute tasks and voice concern; the isolated anaesthesiologist must perform all of these functions at once, acting simultaneously as operator, team leader and monitor. The successful rescue in this case therefore depended not only on the cricothyroidotomy itself, but also on the rapid clinical judgement required to declare a CICO state and commit to surgical access in a challenging environment. We advocate that training for clinicians who may operate in isolation should explicitly reproduce this cognitive load – rehearsing not only the procedure but also the decision to abandon intubation – so that the transition to eFONA becomes a pre-planned response, reducing the need for prolonged deliberation under stress.

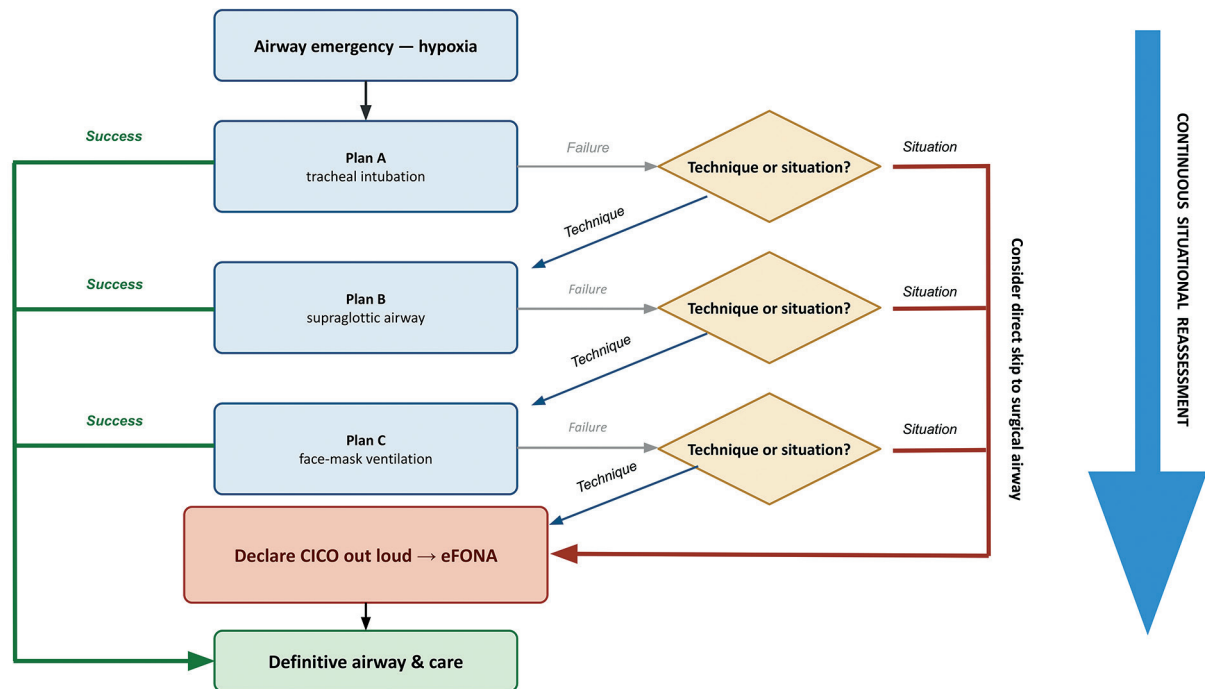


FIGURE 2. A cognitive-decision algorithm for the transition to emergency front-of-neck airway (eFONA) in a “cannot intubate, cannot oxygenate” (CICO) emergency. The technical sequence follows the Difficult Airway Society Plans A–C (tracheal intubation, supraglottic airway, face-mask ventilation), each limited to a single optimised best effort and each having three possible outcomes: success, leading to a definitive airway; a technical failure, prompting the next plan; or recognition that the clinical situation itself renders further attempts unlikely to succeed, permitting an immediate transition to surgical access. A parallel process of continuous situational reassessment (right) prompts the operator at each step to consider whether failure is technical or situational and helps prevent repeated attempts. Convergence on the terminal step prompts the operator to declare the CICO state aloud and proceed directly to scalpel-bougie-tube eFONA, without returning to laryngoscopy

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