

A Can't Ventilate, Can't Intubate Scenario in a Remote Location: A Case Report of a Rescue Approach

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Abstract

Background and objectives: The number of procedures in remote locations has dramatically increased, being an anaesthetic challenge. The most common complications are respiratory events often by over sedation. In remote locations, a can't ventilate can't intubate scenario is worrisome.

Case report: We present a patient scheduled for percutaneous endoscopic gastrostomy under monitored anaesthesia care who represented a "can't ventilate, can't intubate" scenario in the Gastroenterology Department and a rescue approach used to maintain patient oxygenation. The authors were the emergency anaesthesia team in the emergency department. The patient recovered with no sequelae.

Conclusions: The case highlights the importance of planning difficult airway management, delineating alternative plans, and knowing in advance the equipment available. A careful evaluation of the airway remains a cornerstone in anaesthesia, even providing monitored anaesthesia care. The paper draws attention to aspects that could be improved in the approach of a similar case that could happen again in this clinical context.

Keywords: Can't intubate; Can't ventilate; Remote locations

Introduction

The number of procedures in remote locations has dramatically increased in the last years. According to Eurostat, in 2013 the two most common procedures in the European Union were colonoscopies and cataract surgery [1]. Monitored anaesthesia care is the most frequent anaesthetic procedure in that setting. Anaesthesia outside the operating room often represents a challenge for the provider. Some of the difficulties found in this context are related to organizational and infrastructural differences outside the operating room, like the day care setting of most of the procedures, bringing difficulties to carry out an early anaesthetic evaluation and to plan in advance the procedure, the high turnover of patients, the different layout, limited space and access to suction equipment and gas supply, and the time required to get help if some hazard is found. Moreover, training in airway management of the personnel working in these remote areas is often limited [2]. Preparing contingency plans in advance is the first step of a crisis-management plan to avoid potential hazards.

In an investigation done about American Society of Anesthesiologists Closed Claims in remote locations, adverse respiratory events were the most common mechanism of injury, with inadequate oxygenation/ventilation being the most common specific event (21 vs. 3% in operating room claims, $P < 0.001$). The gastrointestinal context accounted for more than 50% of the over sedation claims related to anaesthesia in operating room. There was a higher proportion of claims for death in remote location (54 vs. 29%, $p < 0.001$) [3].

There are scarce published papers of high-quality about airway management outside the operating room, the majority being observational in nature.

Neyrinck (2013) highlights the importance of a careful evaluation of the airway in anaesthesia practice, even during monitored anaesthesia care without airway instrumentation. Drug regimens used in the procedure should be adapted to this context. The practitioner should be aware of the airway devices available in the room [4]. Cook et al. in the 4th National Audit Project of the Royal College of Anaesthetists (NAP4) calculated the incidence of serious airway complications during general anaesthesia to be at least 133 per 2.9 million or one per 22000 general anaesthetics. Of the anaesthesia events reported, 42% had a primary airway event indication intubation difficulty. Problems identified that contributed to adverse events were poor planning of airway management, failure to change routine plans despite evidence of likely difficulty or when that plan failed were identified problems, lack of equipment or operator experience, failure to use capnography and poor communication. In case of emergency airway was required, for anaesthetists cricothyroidotomy was the rescue technique of choice but 65% of these attempts failed [5]. Implementation of equipment and drugs checklists, developing interventional packages for emergency airway management, performance of space layout in close communication with the anaesthesia department are measures that could reduce patient harm in this context [6-9].

We present a case of a "can't ventilate, can't intubate" in the Gastroenterology Department, in which the cricothyrotomy kit was not promptly available. Meanwhile oxygenation was achieved by cannulating a previous tracheostomy scar with a 14 G needle attached to oxygen (O_2) tube.

Case Description

A 56 year-old man, American Society of Anesthesiologists (ASA) 3, with a clinical history of diabetes mellitus type 2 with microvascular complications (diabetic retinopathy), severe obstructive sleep apnoea under continuous positive airway pressure (CPAP) support during sleep, and a previous diagnosis of a carcinoma of hypopharynx seven years before, treated with radiotherapy, with no evidence of disease recurrence, was admitted to the emergency room after an episode of food aspiration, related to dysphagia, with signs of respiratory distress and severe hypoxemic respiratory failure. He was transferred to the intensive care unit after been intubated under sedation, and underwent empirical antibiotic therapy. After performing surgical tracheostomy he was enabled to wean from mechanical ventilation. The improved clinical status allowed spontaneous ventilation, with gradual closure of the tracheostomy hole. Because of the known dysphagia the patient was scheduled for percutaneous endoscopic gastrostomy (PEG) under monitored anaesthesia care in the Gastroenterology Department. His airway evaluation was remarkable for his bad mouth opening, cervical extension less than 90°, retraction of submandibular tissues and a scar of a recent tracheostomy.

After standard ASA monitoring, 40 mg of propofol was administered and "open mouth piece" of pediatric size was put in the mouth patient to allow the progression of the endoscope. Because of poor patient tolerance to the passage of the endoscope a new bolus of 40 mg of propofol was given. Progressive desaturation below 80% and severe hypotension followed. Attempts at bag-mask ventilation with two hands, besides the use of an oropharyngeal tube, failed. Ventilation by laryngeal mask was unsuccessful. Grade IV laryngoscopy was achieved with a Macintosh blade. During these attempts to ventilate the patient the anesthesiologist present in the room asked for the help of the emergency anesthesia team. At the rescue team arrival all the difficulties found were validated.

When asking for a cricothyrotomy device it was noticed that it was not promptly available in the airway emergency kit. In the different attempts to ventilate the patient, and during cervical palpation, it was noticed air passage through a friable hole of about 2 mm in the tracheostomy scar. The introduction of an intravenous 14 G cannula succeeded. Given the absence of jet ventilation in the room, a three-way stopcock was connected to an oxygen source tube. With this maneuver, recovery of peripheral O₂ saturation was achieved. When the cricothyrotomy kit arrived the team used a Seldinger technique to replace the cannula by that device. After some minutes the patient recovered conscience being transferred fully awake with spontaneous ventilation to the postanesthesia care unit. Figure 1 shows the patient tracheostomy scar 24 h after the occurrence of the described episode.

The patient was scheduled for PEG placement in the operating room where a general anesthesia was performed after awake endotracheal intubation with a flexible endoscope. The procedure was uneventfully and the patient went home in the same day of the procedure.



Figure 1: The patient neck 24 h after the described episode.

Discussion

Morbidity has been reported in 1-30% of cases with difficult airway, under sedation. This case highlights the importance of knowing the environment available before each procedure. A careful evaluation of the airway remains a cornerstone in anesthesia, even providing monitored anesthesia care. Delineating alternative plans related to a difficult airway is essential. Having different and sequential strategies to manage the airway is essential to safe anesthesia practice. In case of a "can't ventilate, can't intubate" scenario, needle cricothyrotomy and jet ventilation or surgical cricothyrotomy are the recommended life-saving treatments. In the case described, they were not available, but oxygenation through a 14 G cannula was effective in patient rescue. Some of the limitations identified in the management of difficult airway that were previously described can be identified in the case reported. Indeed, although percutaneous endoscopic gastrostomy PEG often takes place in a remote location, the airway evaluation of this patient might be a justification to do it in a more secure and known place-the theatre, just as it was done after the episode described. Difficulties related to have the essential equipment for an emergent airway were also present. The authors aim publishing this article is to emphasize the fact that airway management outside the operating room remains a high-risk procedure, with a notably high rate of failure of primary intubation attempts, justifying the need of the existence of rescue procedures, algorithms and appropriate personnel in these locations [10,11]. The possibility to use some devices like videolaryngoscopes could improve patient safety in this setting. Improving organizational aspects of care delivery is an essential task and all the specificities that have to be taken into account in planning anesthesia care in the theatre should be considered in remote locations.

Patient Consent

The authors confirm that the patient presented in the paper reviewed the case and gave written permission for the authors to publish the report (informed consent was uploaded separately in the submission process and was signed in patient native language).

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