EJCRIM
European Journal
of Case Reports
in Internal Medicine

"CAN'T INTUBATE CAN'T OXYGENATE" SITUATION IN AN ELECTIVE PATIENT IN SUSPECTED SARCOIDOSIS: A CASE REPORT

Veronica Gerli[1], Eva Koetsier[2,3], Nicola Ledingham[1,3], Paolo Maino[1,2,3]

[1] Anaestesiology, Ospedale Regionale di Lugano - Civico e Italiano, Ente Ospedaliero cantonale, Lugano, Switzerland
[2] Pain Management Center, Neurocenter of Southern Switzerland, Ente Ospedaliero cantonale, Lugano, Switzerland
[3] Faculty of Biomedical Sciences, Università della Svizzera italiana, Lugano, Switzerland

Corresponding author: Veronica Gerli **e-mail:** Veronica.Gerli@eoc.ch

Received: 31/08/2023 **Accepted:** 04/09/2023 **Published:** 26/09/2023

Conflicts of Interests: The Authors declare that there are no competing interests.
Patient Consent: A written informed consent was obtained from the patient for permission to publish his clinical history.
Aknowledgments: The authors thank Liliane Petrini (Ph.D), Breganzona, Switzerland, for medical writing assistance.

How to cite this article: Gerli V, Koetsier E, Ledingham N, Maino P. "Can't intubate can't oxygenate" situation in an elective patient in suspected sarcoidosis: a case report. *EJCRIM* 2023;**10**:doi:10.12890/2023_004088.

ABSTRACT

Anaesthetists and pulmonologists are well trained to follow the "can't intubate, can't oxygenate" (CICO) protocol but the procedure is rarely practised. This case report concerns an elective patient scheduled for endobronchial ultrasound bronchoscopy (EBUS) because of suspected sarcoidosis. Based on known medical history, anaesthesia for EBUS procedure was initiated with a laryngeal mask. The airway turned out to be difficult and the patient was not ventilable despite several efforts including curarization and orotracheal intubation. Rapid desaturation imposed to apply the CICO protocol with emergency cricothyroidotomy as extreme measure but also failed. 6-handed face mask ventilation was continued. Eventually, introduction of a microlaryngeal tube of the 3rd generation laryngeal mask, placed on the fibrescope, allowed endotracheal intubation. The patient fell into pulseless electrical activity, and the CICO protocol was started. Immediate cardiopulmonary resuscitation totally recovered vital functions. In the post-operative follow-up, no temporary or permanent cardiological and neurological sequels were found, but new medical history such as inconstant use of C-PAP (Continuous Positive Airway Pressure) and a significant weight gain since the last notable difficult intubation were uncovered, which explained the patient's compromised airways. Had this information been available prior to the scheduled operation, it would have indicated awake intubation with a local anaesthesia of the oropharynx and appropriate sedation of the patient.

KEYWORDS

3rd generation laryngeal mask, CICO, curare, difficult airway ventilation, microlaryngeal tube.

LEARNING POINTS

- The CICO protocol was effective to manage an unanticipated difficult airway. The patient was resuscitated with the use of a microlaryngeal endotracheal tube of the 3rd generation laryngeal mask, placed on the fibrescope.
- The patient's previous and current medical condition is of vital importance for the pre-operative anaesthetic assessment.
- Specific questioning during the pre-operative anaesthetic interview could detect events that seem to be insignificant to the patient but are significant for a diagnostic intervention in a new situation.

EFIM
European Federation of Internal Medicine

Publisher
smc media srl

INTRODUCTION

Various guidelines address the management of anticipated or unanticipated difficult airways in emergency medicine[1,2]. This case report concerns the application of the "can't intubate, can't oxygenate" (CICO) protocol for an elective patient scheduled for endobronchial ultrasound bronchoscopy and the necessity to revert to emergency procedures rarely practised, in this case an emergency intubation requiring cricothyroidotomy. Knowing the precise medical history is essential to determine the individualised type of anaesthesia to avoid life-threatening complications.

CASE PRESENTATION

A 55-year-old male patient was scheduled for a diagnostic thoracic endoscopy examination using endobronchial ultrasound (EBUS) indicated by suspected sarcoidosis due to the presence of enlarged ilo-mediastinal lymph nodes. The patient was classified ASA 3[3] (American Society of Anesthesiologists) because of hypertension, obesity class II, history of embolic phenomenon treated with insertion of a caval filter. The patient's Mallampati score, inter incisive distance, cervical mobility, enlarged neck circumference, and inelastic spine from numerous spinal surgeries with stabilizations foreshadowed a potential difficult intubation.

Preoperative consultation revealed no preoccupying issues to be considered for the anaesthesia. The patient's record included a testimony of a potential difficult airway described several years ago by an anaesthesiologist. A laryngoscopic view of Cormack Lehane grade IV during direct laringoscopy with effective ventilation in face and laryngeal mask was included. Therefore, we opted to perform the EBUS procedure with a laryngeal mask, which provides a better angle for the bronchoscope according to our pulmonologists and ensures excellent oxygenation[4].

In the bronchoscopy room a trolley with the necessary equipment for the management of an eventual difficult airway was available according to the FLAVA algorithm, the local protocol applied in Southern Switzerland[2].

The patient scheduled for elective EBUS was fasted and made to lie down in the ramped and optimized sniffing position. Standard monitoring for Heart Rate-Arterial Pressure-SpO_2, sedline Masimo® (neuromonitoring for depth of anaesthesia), and venous infusion access were implemented. As per standard, the patient was preoxygenated for 3–5 minutes.

After induction with fentanyl (2 micrograms/kg) and propofol (2 mg/kg), the patient was not ventilatable with the face mask despite the positioning of an oropharyngeal airway. The attempt to insert an Ambu® AuraGain No. 5 laryngeal mask (size related to patient's weight) to maintain effective ventilation failed due to the mouth opening, so a No. 4 was reinserted with difficulty, however, without successful end-tidal CO_2 in manual and mechanical ventilation. Progressive significant desaturation and inability to wait for the patient's waking from deep narcosis led us to proceeded with curarization to improve ventilation in face and laryngeal mask[4-6] and to try orotracheal intubation using a video laryngoscope, but both attempts failed. Video laryngoscopy did not show a recognisable glottic structure. The CICO protocol had to be implemented. We first tried to intubate with Cook® Airway Exchange Catheter, however, oxygenation was ineffective because proper device placement failed. Rapid desaturation (SpO_2 54%) required to execute an emergency cricothyroidotomy as an extreme measure. In the interim period, 6-handed face mask ventilation (4 on the mask and 2 for ventilation of the balloon connected to the ventilator) was continued. An important surgical scar and difficulty in finding the cricothyroid space caused the failure of the cricothyroid manoeuvre. The patient was then antagonised from muscle relaxation with a full dose of sugammadex (16 mg/kg). With support of the pulmonologist and a fibreoptic scope, the No. 4 laryngeal mask was repositioned and a standard No. 6 endotracheal tube (Convidien™ Shiley™, hi-contour oral/nasal, length 25 cm) was inserted while the laryngeal mask served as intubation device. However, the tube was too short, providing unsatisfactory ventilation as it did not surpass the plane of the vocal cords. It was replaced by a 3rd generation laryngeal mask, No. 5 microlaryngeal endotracheal tube (Teleflex®, Ruschelit® oral/nasal, length 28 cm), correctly positioned 3 cm from the hull. End-tidal CO_2 was restored and saturation rose. Effective intubation and ventilation of the patient was eventually achieved by placing a cuffed tube in the airway. Between the attempted intubation with Cook® Airway Exchange Catheter and cricothyroidotomy, the patient became bradycardic and fell into pulseless electrical activity. Immediate cardiopulmonary resuscitation was initiated by administering 1 mg of adrenaline. Normocardic rhythm and peripheral pulse were restored. The patient was then admitted to intensive care and after a few hours, he had definite surgical tracheostomy in the operating theatre.

Upon awakening, the patient was conscious and cooperative. Cardiological and neurological checks revealed no temporary or permanent findings. Later, in a patient and family interview, we learned about the patient's inconstant use of nocturnal continuous positive airway pressure (C-PAP) and a weight gain of 15 kg over the past 5 years.

The patient was discharged six days later from hospital without sequelae. The patient underwent further investigations with serial spirometry and radiological investigations (CT scan) for suspected sarcoidosis.

DISCUSSION

Prior knowledge about the patient's inconstant use of C-PAP and significant weight gain since the last notable difficult intubation during the preoperative anaesthetic assessment, would have raised suspicion of a compromised airway and imposed a different anaesthesiologic approach to minimize the risk of a life-threatening situation. In our case, an awake intubation with a local anaesthesia of the oropharynx and appropriate sedation of the patient maintaining the respiratory trigger would have avoided the risk of losing the patient's airway[7,8].

Some authors support the possibility of curarization of the non ventilable patient with face mask ventilation[5,6,9] as a valid method to avoid waiting for the return of spontaneous ventilation. Despite deep curarization and the use of a video laryngoscope for intubation, face mask ventilation was impossible. To account for the suboptimal conformation of the patient's pharyngo-laryngeal structures, the use of a 3rd generation laryngeal mask with its natural anatomical curvature permitted an adequate guide for the fibreoptic scope to perform the endotracheal intubation close to the laryngeal aditus. In this case, the use of a narrower and longer tube ensured proper placement within the trachea.

REFERENCES

1. Apfelbaum JL, Hagberg CA, Connis RT, Abdelmalak BB, Agarkar M, Dutton RP, et al. 2022 American Society of Anesthesiologists Practice Guidelines for Management of the Difficult Airway. *Anesthesiology* 2022;**136**:31-81.
2. Casso G, Savoldelli GL, Balmer C, Ravussin P, Schoettker P. Swiss Latin Airway Guidelines: a holistic approach for improving airway management. *Swiss Medical Weekly* 2022;**152**:w30225.
3. Higgs A, McGrath BA, Goddard C, Rangasami J, Suntharalingam G, Gale R, et al. Guidelines for the management of tracheal intubation in critically ill adults. *Br J Anaesth* 2018;**120**:323-352.
4. Douadi Y, Bentayeb H, Malinowski S, Hoguet E, Lecuyer E, Boutemy Met al. Anaesthesia for bronchial echoendoscopy: experience with the laryngeal mask. *Rev Mal Respir* 2010;**27**:37-41.
5. Nielsen JR. Difficult mask ventilation and muscle relaxation. *Anaesthesia* 2018;**73**:255.
6. Saastamoinen M, Larsson J, Frykholm P. Checking mask ventilation before neuromuscular block: A nation-wide survey of anaesthetists' attitudes and thinking. *Acta Anaesthesiol Scand* 2019;**63**:1178-1183.
7. Ahmad I, El-Boghdadly K, Bhagrath R, Hodzovic I, McNarry AF, Mir F, et al. Difficult Airway Society guidelines for awake tracheal intubation (ATI) in adults. *Anaesthesia* 2020;**75**:509-528.