Awake intubation in a patient with morbid obesity in the emergency department: our experience

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Abstract

Awake intubation is considered the standard of care for the management of the anticipated difficult airway. For its pharmacological properties, remifentanil is ideal for managing difficult endotracheal insertions. This process is augmented by the use of transtracheal injection of lidocaine as it disperses evenly around the area and facilitates the action of remifentanil further. A 48-year-old male patient, weight 200 kg, 184cm tall (BMI>40) came into the emergency room for severe hypercapnic hypoxic respiratory failure. Awake fiberoptic intubation was the option to secure the airway. Successful airway management is critical to the practice of emergency medicine. All anesthesiologists should be familiar with the airway management of obese patients.

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Introduction

Recently the American Society of Anesthesiologists (ASA)[1] developed "Practice Guidelines for Management of the Difficult Airway" to provide anesthesia practitioners with an evidence-based, stepwise approach to making decisions when encountering an actual or potentially difficult airway. According to these guidelines, awake intubation is appropriate if the patient is suspected to be a difficult intubation and one or more of the following apply:[1] difficult ventilation (face mask/supraglottic airway),[2] increased risk of aspiration,[3] the patient is likely incapable of tolerating a brief apneic episode, or[4] there is expected difficulty with emergency invasive airway rescue. In this context, awake intubation improves intubation success and reduces airway-related adverse outcomes.

Awake tracheal intubation is a skill that requires practice and may not be a technique that gets routinely used in some clinical practice settings. The safety benefits of an awake approach include maintenance of airway patency, oxygenation, and protection against aspiration.[3] The presence of obstructing airway pathology, risk of rapid desaturation (e.g., morbid obesity), and increased risk of aspiration favor the awake approach. The main objective in all airway management is to avoid the "cannot intubate, cannot ventilate" situation, because emergency surgical airway attempts fail in 50%–65% of patients when performed by an anesthesiologist.[4,5] Patients with morbid obesity possess one or more anatomical features associated with difficult mask ventilation and rapid development of hypoxemia. Proper management of obese patients requires a team vision and appropriate behaviors by all healthcare providers in the hospital. Specialist competencies are fundamental, as are specific clinical pathways and good clinical practices designed to deal with patients whose Body Mass Index (BMI) is ≥30 kg/m^2. Periprocedural assessment and critical care strategies designed specifically for obese patients are crucial for reducing morbidity and mortality in emergency settings, critical care, and other particular settings. To respond to the expected "globesity" (marked increase in the obese population) phenomenon in Italy, the Italian Society of Anesthesia, Analgesia, Resuscitation and Intensive Care (SIAARTI) established an Obesity Project Task Force, within the SIAARTI Airway Management Study Group, to carry out a consensus project. The overall aim of the project was to identify Good Clinical Practices (GCPs) and Clinical Pathways (CPWs) for risk reduction in obese hospitalized patients. In particular, the Task Force aimed to define the best levels of perioperative and periprocedural care for obese

patients and the best procedures for anesthesiology, pain management, respiratory care, and critical care medicine. In addition, the Task Force considered relevant human factors such as anesthetists' non-technical skills and crisis management strategies, as suggested by the Helsinki Declaration on Patient Safety in Anaesthesiology.[6-12]

Airway management of an unanticipated or emergency difficult airway consists of interventions addressing calling for help, optimization of oxygenation, use of a cognitive aid, noninvasive airway management devices, combination techniques, invasive airway management interventions, and ECMO.[1] Devices for noninvasive airway management of patients with unanticipated or emergency difficult airways include rigid laryngoscopic blades, adjuncts (e.g., introducers, bougies, stylets, etc.), video laryngoscopes, flexible bronchoscopy, supraglottic airway devices, optical stylets, and rigid bronchoscopes.

Awake tracheal intubation may be safely and effectively performed with or without sedation. However, its use during ATI can reduce patient anxiety and discomfort and increase procedural tolerance. Minimal sedation is defined as "a drug-induced state during which the patient responds normally to verbal commands, whilst the airway, spontaneous ventilation, and cardiovascular function are unaffected". Caution should be always taken when administering sedative drugs since airway obstruction may occur even with minimal sedation, especially in patients with OSAS.

Remifentanil is a potent ultra-short-acting selective μ-opioid agonist, which causes analgesia and respiratory depression; this drug is faster-acting and more potent than other drugs in this class such as fentanyl and alfentanil.[2] These properties make remifentanil ideal for managing difficult endotracheal insertions. From 2002 onwards, several studies have progressively demonstrated the efficacy of remifentanil in analgosedation for fibro bronchoscopy in patients with particularly difficult airways thanks to its peculiar pharmacological characteristics.[6,7]

Topical anesthesia of the oral cavity/oropharynx and then of laryngeal and subglottic mucosa – with the "spray as you go technique" – is mandatory to better tolerate fiber bronchoscope and the tube was advanced into the trachea Application of local anesthesia to the vocal cords and infraglottic structures does not increase the risk of aspiration from a full stomach, provided that the patient is not over sedated.

Adequate airway anesthesia is vitally important for success. The "spray as you go" technique would normally be used in cases where you were using a fiber optic bronchoscope as this aids remifentanil use.[9] It is noted that introducing this form of spray is difficult to achieve in patients with critical obstruction.[10] Trans tracheal injection of local anesthesia carries risks as the anatomy can be difficult to identify. A high level of topical anesthesia with good patient acceptance is noted but it should be done by those with specialist training.[9]

The risk of causing discomfort to the patient which would precipitate coughing was high and this is where delivering a trans tracheal injection made the procedure much easier to tolerate. This allowed us to pass the endotracheal tube safely and uneventfully. Good anesthetic technical skills, a cooperative patient, and adequate topical anesthesia are the three vital components for success.

The most commonly used local anesthetic agent is lidocaine, for the safety benefits over other local anesthetic agents due to a favorable cardiovascular and systemic toxicity risk profile.

Case Report

In our experience, we have performed ATI in the emergency room on a 48-year-old male patient, weight 200 kg, 184cm tall (BMI>40) came into the emergency room for severe hypercapnic hypoxic respiratory failure. His past medical history was significant for obstructive sleep apnea OSAS, arterial hypertension, and myasthenia gravis. The vital parameters at hospital admission were: spO2 88%, BP 150/90 mmHg, HR 98 bpm. Blood gas analysis showed moderate hypoxemia and hypercarbia (pH 7.32, pO2 55, pCO2 82).

Clinical physical examination revealed: Mallampati 3, reduced range of motion of the head, mental–thyroidal distance less than 6 cm, an inter-incisive distance less than 3 cm, macrogloxy, Stop BANG questionnaire >5

Non-invasive ventilation, namely support pressure ventilation through a total face mask, was attempted for half an hour without clinical success. Due to the clinical worsening of respiratory failure, the patient was intubated. The problem of a difficult airway was easily recognizable due to the physical status of the patient. Awake fiberoptic intubation was the option to secure the airway.

With the patient in the Ramped position,[12] HFNO 60 l/min FiO2 70% was administered for 5 minutes. The patient was anesthetized with lidocaine 10mg/ml 1% solution (5ml total) topical spray anesthesia. Atropine 0.5mg and a remifentanil infusion initiated at 0.05mcg/kg/min were administered intravenously.

Awake fiberoptic intubation was started as soon as the patient reached a Ramsay sedation scale score of 2.

Additional 1% lidocaine was applied using a "spray as you go technique" through the bronchoscope

Through an oral airway, the fiber optic bronchoscope was advanced until the vocal cords were visualized. The bronchoscope was then passed through the vocal cords to a level slightly above the carina, and an endotracheal tube with a 7.5 internal diameter was placed. After the withdrawal of the bronchoscope, endotracheal intubation was further confirmed with capnography. After successful intubation propofol 150 mg and rocuronio 100mg were administered. Saturation and vital parameters remained stable throughout the procedure.

Conclusions

Recent findings and our experience suggest that successful airway management is critical to the practice of emergency medicine. All anesthesiologists should be familiar with the airway management of obese patients.

Successful airway management depends on formulating a plan that relies on a thorough airway assessment.

The correct application of the noninvasive devices for airway management must be based on patient anatomy, pathology, and the skills of the user for attempted intubation of an anticipated difficult airway.

Awake intubation may be indicated, in the emergency room too, when there is known or suspected difficulty with mask ventilation or tracheal intubation, especially if there is expected difficulty with emergency invasive airway rescue.

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