

Comprehensive Case Study on Awake Fiberoptic Intubation for Ameloblastoma with a Challenging Airway

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Abstract: Ameloblastoma is a benign odontogenic tumor commonly found in the jawbone. It originates from remnants of tooth germ epithelium, odontogenic cyst epithelium, stratified squamous epithelium, and enamel organ epithelium. It represents about 1% of oral tumors. Endotracheal intubation is a common procedure and is a technique that cannot be separated from modern anesthesia and surgery. This case report details an instance of successful awake fiberoptic nasotracheal intubation in a 33-year-old female patient with ameloblastoma, presenting a challenging airway situation. The case underscores the significance of meticulous airway management in the context of anesthesia and surgery, highlighting the use of topical anesthetics and careful planning to ensure patient safety. The report emphasizes the anesthesiologists role in continually updating their knowledge and skills in airway management.

Keywords: Ameoblastoma, Awake fiberoptic, Airway management

1. Introduction

Ameloblastoma is an odontogenic epithelial neoplasm, primarily involving enamel organ-type tissue that has not yet differentiated into hard tissue. Ameloblastoma accounts for approximately 1% of all oral tumors and about 9-11% of odontogenic tumors. It generally grows slowly but exhibits local invasiveness. Ameloblastoma is a locally destructive tumor with a tendency to recur if not completely excised. Mandibular ameloblastoma can grow large, causing facial asymmetry, tooth displacement, malocclusion, and pathological fractures.^{[1],[2]} The use of an endotracheal tube is very popular in handling the airway during surgery. Until now, endotracheal intubation is a common procedure and is a technique that cannot be separated from modern anesthesia and surgery. Laryngoscope is a device used to support endotracheal intubation.^{[3]-[4]} However, in some cases the use of a laryngoscope is difficult, as is the case with ameloblastoma which will be discussed in this case report. A 33 year old woman with complaints of a purulent lump in her left jaw and difficulty opening her mouth. The purpose of this case report is to discuss the challenges and techniques in managing a difficult airway in a patient with ameloblastoma undergoing awake fiberoptic intubation and this case report is significant as it contributes to the existing knowledge on anesthesiology practices, specifically in managing complex airway situations in patients with ameloblastoma.

2. Case Report

The patient came with complaints of a surgical scar on the left jaw that was said to be festering. The patient reported undergoing surgery for a lump in the left jaw in January 2023. The lump appeared 4 years ago. At first it was as big as a chicken egg, then it got bigger and bigger, making it difficult for the patient to open her jaw. Vital sign showed within normal limit, on physical examination showed based on LEMON criteria; Look Externally: Normal neck flexion,

Mallampati sde, incomplete teeth, visible surgical scars on the mandible, the position of the teeth on the maxilla and mandible looks asymmetrical. Evaluate 3-3-2 rule: inter-incisor distance below 3 finger, Hyoid-to-mentum distance within 3 finger, hyoid to laryngeal prominence within 2 finger Mallampati: difficult to evaluate, no airway obstruction, normal neck flexion, as shown in figure 1. On blood test showed within normal limits, but on Head CT Scan shows a mixed density expansive lesion (cystic and solid, lobulated irregular edges and thinning of bone) was seen. Size 4.94 cm x 6.29 cm on the left mandible with displacement of the tooth structure (molar to medial). There were also multiple cystic lesions in the bones of the maxillary sinuses right and left, the nasal bones, and all the facial bones and skull (impressions consistent with ameloblastoma), as shown in figure 2 Patient were classified into physical status ASA 3 with difficult airway. The patient was then given premedication in the form of Ondansetron 8 mg IV, Dexamethasone 10 mg IV Diphenhydramine 20 mg IV, Fentanyl 25 mcg IV; Topicalize the airway with 10% xylocaine spray in the oropharynx area, give oxymetazoline drop to the left nasal. Awake intubation was performed using a fiberoptic device on the left nasal by an anesthesiologist. Patient also given fentanyl 100 mcg for analgetics purpose. After successful intubation, the patient was induced and maintained with propofol using TCI. The patient was also given a muscle relaxant in the form of atracurium 25 mg. To maintenance pain during the operation patient were given Sandetofen 50 mg, Fentanyl 50mcg.

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Figure 1

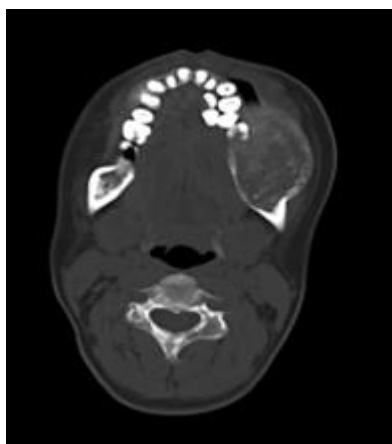


Figure 2



Figure 3

3. Discussion

From the physical examination, the patient appeared to have difficulties in airway management, specifically difficulties in ventilation and intubation caused by a large post-reconstruction ameloblastoma. Ventilation difficulties were obtained due to post-reconstruction ameloblastoma which prevented the achievement of a mask seal when a face mask was performed. Difficult intubation is also a consequence of extensive reconstruction, which results in difficulty inserting the laryngoscope and the risk of intraoral bleeding from laryngoscopy. The patient was concluded with ASA III physical status, with actual problems with difficulty in airway management, namely difficult ventilation and difficult intubation. The patient was planned with GA-NTT awake intubation using fiberoptic anesthesia. From this case, the use of the awake intubation technique requires good preparation starting from explaining to the patient the steps of the intubation procedure, taking into account the patient's anxiety, discomfort, and the risk of aspiration.

In difficult airway management, it is important to have backup plans if the primary plan fails. If the decision is made to secure the airway through intubation using an endotracheal tube (ETT), a small-sized ETT should be prepared. Tumors in the airway can be fragile, leading to uncontrolled bleeding, so intubation must be performed gently and carefully. Additionally, long-acting sedatives, respiratory-depressant drugs, and muscle relaxants should be avoided. ASA introduced a new difficult airway management algorithm in 2022, starting with the basic question of whether there is potential difficulty in the airway. In this patient, potential airway difficulty has been identified due to difficult laryngoscopy caused by a mass. According to ASA, difficult airway is a situation where an anesthesia expert encounters difficulty in ventilating the face mask or performing conventional intubation. After identifying potential airway difficulty, the next steps in the algorithm involve determining whether to perform awake intubation or induction before intubation, whether to use invasive techniques, whether video-assisted laryngoscopy is needed, and whether to maintain spontaneous ventilation. Once these considerations are formulated, the next step is to follow the algorithm diagram.^{[5]-[8]}

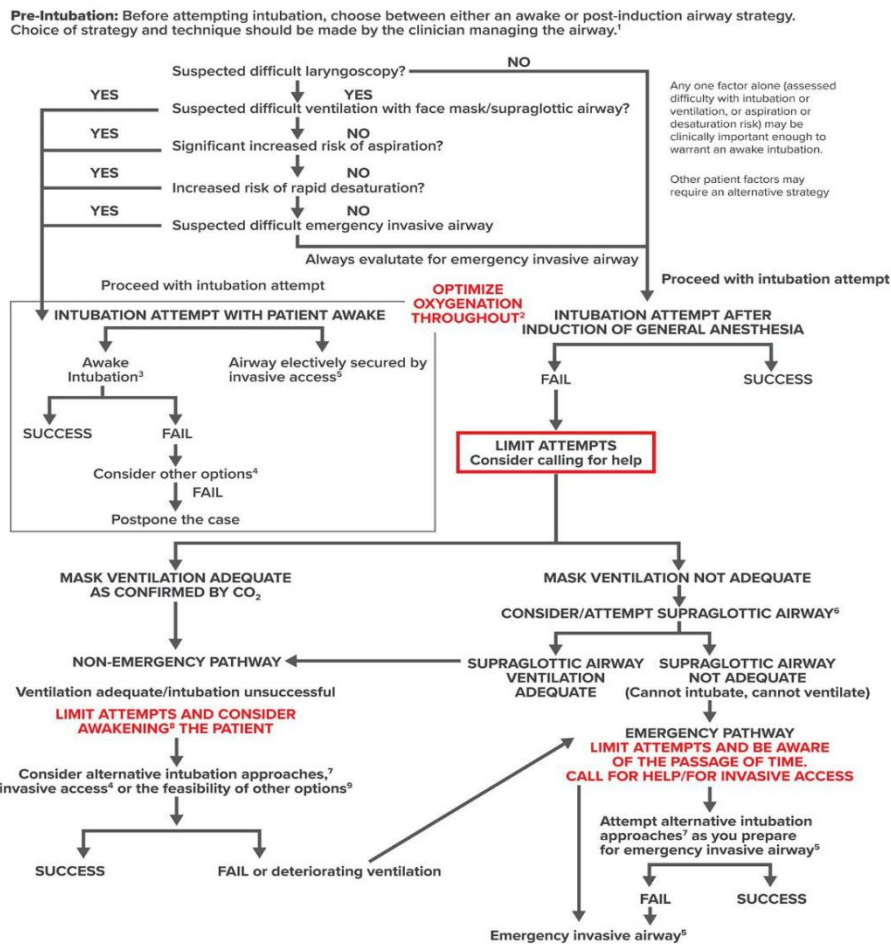


Figure 4: ASA Difficult Airway Algorithm: Adult Patients

Premedication given to patients is anti-inflammatory, antihistamine, antiemetic, analgesic, airway topicalization with local anesthetics, as well as the addition of adjuvants in the form of α_2 agonists: In addition, the patient is also given a mucosal vasoconstrictor. The use of anti-inflammatory and anti-histamine drugs in the form of dexamethasone at a dose of 10 mg and 20 mg diphenhydramine in patients aims to prevent inflammation that occurs during awake intubation, but also to make patients comfortable during and prevent complaints of painful swallowing during post-op. Giving fentanyl can also help the analgesic effect. The patient was also given a mucosal vasoconstrictor, namely oxymetazoline because the nose and nasopharynx have high vascularity and bleed easily during awake fiberoptic intubation. In this patient, airway topicalization was performed with 10% xylocaine spray. Topicalization should focus on the base of the tongue (the pressure receptors here act as the afferent component of the gag reflex), the oropharynx, hypopharynx, and laryngeal structures. If nasotracheal intubation is planned, the nasal cavity should also be topicalized. Another alternative in topicalizing the airway is the use of an atomizer, nebulizer, or peripheral nerve block.^{[7]-[9]}

4. Conclusion

Management of the difficult airway is a challenge to anesthesiologists, and may lead to life-threatening complications. They highlight the importance of risk assessment, provide a new decision tree to help determine when to consider awake airway management, awareness of

task fixation and time passage, limiting the number of tracheal intubation attempts, and assessing ventilation after every intervention. The case study demonstrates the efficacy of awake fiberoptic nasotracheal intubation in managing a difficult airway in ameloblastoma, highlighting the need for anesthesiologists to remain updated on airway management techniques for ensuring patient safety.

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