

CASO CLÍNICO / CASE REPORT

Orotracheal Intubation in a Patient with a Facial Tumor and Difficult Airway: A Case Report

Intubação Orotraqueal num Doente com Tumor Facial e Via Aérea Difícil: Relato de Caso

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Keywords

Airway Management; Facial Neoplasms; Intubation, Intratracheal; Laryngoscopy; Neurofibromatosis 1.

Palavras-chave

Gestão da Via Aérea; Intubação Intratraqueal; Laringoscopia; Neoplasias Faciais; Neurofibromatose 1.

ABSTRACT

Difficult airway management remains a major challenge in anesthesiology, particularly in patients with head and neck tumors. We report the case of a 22-year-old male patient. ASA II, with neurofibromatosis type I and an extensive facial tumor presented with significant anatomical distortion, limited mouth opening, and an anticipated difficult airway. Awake intubation with topical anesthesia and maintenance of spontaneous ventilation was planned. Despite adequate local anesthesia and good glottic visualization, the procedure was discontinued after three unsuccessful attempts due to intense nausea. A balanced anesthetic induction was then performed, with full preparation for airway failure. Orotracheal intubation using a videolaryngoscope and bougie was successfully achieved on the first attempt, without oxygen desaturation. The surgical procedure and extubation were uneventful. This case highlights the importance of thorough planning, flexibility in airway management strategies, and the use of advanced technologies to ensure safe management of the difficult airway.

RESUMO

A gestão da via aérea difícil continua a ser um desafio importante em anestesiologia, particularmente em doentes com tumores da cabeça e pescoço. Apresentamos o caso de um doente do sexo masculino, com 22 anos, ASA II, com neurofibromatose tipo 1 e um extenso tumor facial, que apresentava distorção anatómica significativa, limitação da abertura oral e uma via aérea difícil previsível.

Foi planeada uma intubação em vigília, com anestesia tópica e manutenção da ventilação espontânea. Apesar de uma adequada anestesia local e boa visualização da glote, o procedimento foi interrompido após três tentativas infrutíferas, devido a náuseas intensas.

Procedeu-se então a uma indução anestésica equilibrada, com preparação completa para falência da via aérea. A intubação oro-traqueal, utilizando videolaringoscópio e bougie, foi realizada com sucesso à primeira tentativa, sem dessaturação de oxigénio. O procedimento cirúrgico e a extubação decorreram sem intercorrências.

Este caso destaca a importância de um planeamento rigoroso, da flexibilidade nas estratégias de abordagem da via aérea e da utilização de tecnologias avançadas para garantir uma gestão segura da via aérea difícil.

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INTRODUCTION

The difficult airway (DA) remains one of the greatest challenges for the contemporary anesthesiologist, representing a significant cause of perioperative morbidity and mortality even in specialized centers. It is estimated that approximately 30% of severe anesthesia-related complications are associated with failures in airway management, including hypoxia, traumatic injuries, pulmonary aspiration, and cardiorespiratory arrest.¹

The presence of head and neck tumors is one of the most significant predictors of anatomical difficult airway, due to distortion of facial planes, limited mouth opening, tumor infiltration, and involvement of supraglottic structures.²

The increasing incidence of advanced-stage head and neck neoplasms, particularly in developing countries, has heightened the complexity of anesthetic management in this subgroup of patients.³ These tumors often exhibit irregular growth, a tendency to bleed easily, tissue friability, and significant pain, making airway management not only technically challenging but also potentially hazardous, especially during attempts at laryngoscopy or instrumental manipulation.

In recent decades, significant advances have been achieved in the management of the difficult airway. Guidelines such as those from the American Society of Anesthesiologists (ASA, 2022) and the Difficult Airway Society (DAS, 2020) emphasize the need for thorough preoperative assessment, anticipatory planning, the use of structured algorithms, and a preference for techniques that minimize desaturation and loss of airway control, such as awake intubation, particularly in patients with significant anatomical distortion.^{4,5} Randomized clinical trials and meta-analyses have also demonstrated that the use of high-resolution videolaryngoscopes significantly increases first-pass success rates and reduces complications compared with direct laryngoscopy, especially in scenarios of anticipated difficult airway.^{6,7}

However, even with the availability of advanced technological resources, awake intubation may fail due to nausea, coughing, anxiety, discomfort, bleeding, or extreme anatomical difficulty. Therefore, mastery of alternative strategies is essential, including optimized mask ventilation with an effective seal, the use of supraglottic devices as a bridge, fiberoptic bronchoscopy, bougie-assisted intubation, combined videolaryngoscopy–fibroscopy techniques, and readiness to perform emergency cricothyrotomy when necessary.

In this context, case reports involving facial tumors are highly relevant to clinical practice. Such scenarios illustrate not only the application of established airway management algorithms but also the need for dynamic clinical reasoning, adaptation to patient responses, and coordinated integration of different airway management techniques. The case described in this article involves a patient with a large facial tumor undergoing resection under general anesthesia, highlighting preoperative planning, attempts at awake intubation, the reasons for initial failure, and the strategy that ultimately led to successful airway control, thereby contributing to the body of evidence on safe and effective difficult airway management.

This case report was submitted for ethical review and approved by the Research Ethics Committee of the Hospital de Urgências de Goiás, under CAAE number 67365023.2.0000.0033, in compliance with the requirements of the 1964 Declaration of Helsinki.

CASE REPORT

A 22-year-old male patient, weighing 63 kg, classified as ASA physical status II, with a diagnosis of neurofibromatosis type I, presented with a large facial tumor associated with significant anatomical distortion, marked limitation of mouth opening, and alteration of mandibular contour (**Fig. 1**). During the pre-anesthetic evaluation, multiple predictors of anticipated difficult airway were identified, including Mallampati class IV, reduced mouth opening, and displacement of oropharyngeal structures (**Fig. 2**).



Figure 1. Large facial tumor associated with significant facial anatomical distortion.

Given this scenario, awake oro-tracheal intubation was initially chosen to maintain spontaneous ventilation and enhance airway safety. Topical anesthesia was performed using nebulized 2% lidocaine combined with oropharyngeal spray, resulting in adequate local analgesia and initial patient cooperation. Despite the absence of pain complaints, the procedure was limited by intense nausea, which compromised tolerance to airway manipulation. Three attempts at awake intubation were made, with good glottic visualization; however, advancement of the endotracheal tube was unsuccessful.



Figure 2. Airway assessment.

Given the technical difficulty and with full preparation for potential failure of intubation and ventilation, a balanced anesthetic induction was performed using propofol, remifentanyl, and rocuronium, maintaining appropriate safety conditions. Orotracheal intubation with a videolaryngoscope combined with a bougie was successfully achieved on the first attempt, without episodes of oxygen desaturation or hemodynamic instability.

The surgical procedure was completed without complications. At the end of surgery, the patient was extubated in the operating room, maintaining effective spontaneous ventilation and stable hemodynamic parameters. He remained in the post-anesthesia care unit for one hour without adverse events and was subsequently transferred to the surgical ward for postoperative follow-up.

DISCUSSION

Difficult airway management remains one of the central challenges of modern anesthesiology and is recognized as a major cause of severe complications, including hypoxia, neurological injury, and death. The Fourth National Audit Project (NAP4) demonstrated that failures in airway management are frequently associated with catastrophic outcomes, particularly when there is inadequate anticipation or lack of structured planning for complex situations.¹ Therefore, early recognition of an anticipated difficult airway is a crucial step in ensuring perioperative safety, as also described in classic

anesthesiology textbooks.²

Patients with head and neck tumors represent a particularly vulnerable group due to progressive anatomical changes that impair both mask ventilation and tracheal intubation. Given the high global incidence of neoplasms and their growing impact on surgical practice, such cases must be regarded as highly relevant in the contemporary epidemiological context.³ Furthermore, associated conditions such as neurofibromatosis type I may produce extensive and unpredictable facial distortions, significantly increasing the risk of a difficult airway. Current guidelines emphasize that in the presence of an anticipated difficult airway, awake intubation should be considered the strategy of choice, as it allows maintenance of spontaneous ventilation and preservation of protective reflexes until definitive airway control is achieved.⁴ The management described in this case is consistent with these recommendations, as the initial attempt with topical anesthesia was performed to minimize the risk of failure after induction. Similar approaches are widely discussed in *Miller's Anesthesia*, which highlights awake intubation as the gold standard in scenarios with a high risk of ventilatory failure.²

However, despite being the preferred technique, awake intubation has important practical limitations. Patient tolerance is a critical factor, and complications such as nausea, anxiety, and discomfort may preclude its safe performance, necessitating a change in strategy.² In this case, the presence of intense nausea despite adequate topical anesthesia reinforces that the success of the technique depends not only on anatomical factors but also on clinical acceptability and patient cooperation, as emphasized in the ASA guidelines.⁴

Following failure of the awake approach, controlled anesthetic induction was undertaken with full preparation for potential intubation failure. Such a decision should only be made when adequate resources for emergency management are immediately available, including advanced airway devices and readiness for a "cannot intubate, cannot oxygenate" (CICO) scenario, considered one of the most critical events in anesthetic practice.⁴ The NAP4 report highlights that the absence of a structured backup plan is one of the main factors associated with major complications in difficult airway cases.¹

In this context, videolaryngoscopy plays an increasingly central role. A Cochrane systematic review demonstrated that videolaryngoscopy improves first-attempt success rates and reduces intubation failures, particularly in anticipated difficult airways.⁶ Additionally, a randomized study by Aziz et al. showed the superiority of the C-MAC videolaryngoscope compared with direct laryngoscopy in patients with predicted difficult airways, providing better glottic visualization and higher intubation success rates.⁷ Therefore, the choice of videolaryngoscopy combined with bougie assistance in this case represents an evidence-based approach aligned with contemporary practice.^{6,7}

The Difficult Airway Society (DAS) guidelines also emphasize that stepwise algorithms, limitation of attempts, and rapid progression to alternative techniques are essential to reduce

morbidity.⁵ Although these guidelines are primarily focused on unanticipated difficult intubation, their core principles—such as avoiding multiple traumatic attempts and ensuring continuous oxygenation—remain applicable in complex anticipated scenarios.⁵

Another fundamental aspect concerns extubation management. Patients with cervicofacial tumors are at increased risk of delayed airway obstruction due to edema, bleeding, or anatomical collapse. ASA guidelines stress that extubation should be regarded as a critical phase and must be carefully planned, particularly in patients with anticipated difficult airways.⁴ Prolonged observation in the post-anesthesia care unit, as performed in the present case, reflects adherence to the principle of continuous vigilance advocated in international guidelines.^{4,5}

CONCLUSION

This case report reinforces that the safe management of the difficult airway in patients with facial tumors requires a systematic approach: thorough preoperative assessment, initial attempt at awake intubation when indicated, prompt adaptation in the event of patient intolerance, and the use of advanced technologies such as videolaryngoscopy and tracheal introducers. Furthermore, this case exemplifies the importance of well-trained teams and clearly defined contingency plans—cornerstones emphasized both by the NAP4 and by current international guidelines.

CONTRIBUTORSHIP STATEMENT / DECLARAÇÃO DE CONTRIBUIÇÃO

DOR: Conceptualization, methodology, investigation, data collection validation, writing the original draft and reviewing.
PGCA: Visualisation and editing.

TLD: Visualisation and editing.

EPTJ: Investigation and data collection validation.

GSE: Data analysis, editing and reviewing.

GG: Conceptualization, methodology, writing the original draft.

All authors approved the final version to be published.

DOR: Conceitualização, metodologia, investigação, validação da recolha de dados, redação do rascunho original e revisão.

PGCA: Visualização e edição.

TLD: Visualização e edição.

EPTJ: Investigação e validação da recolha de dados.

GSE: Análise de dados, edição e revisão.

GG: Conceitualização, metodologia, redação do rascunho original.

Todos os autores aprovaram a versão final.

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