

## Challenges and solutions from the anesthetic perspective in total rhinectomy: case report

*Desafios e soluções pela perspectiva anestésica na rinectomia total: relato de caso*

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### ABSTRACT

Total rhinectomy, although rare in surgical practice, presents a significant challenge for the anesthesiologist, especially regarding airway management for ventilation and orotracheal intubation (OTI). This case report describes the challenges and solutions adopted in our service to perform the procedure, highlighting alternatives when the bronchoscope, the gold standard for OTI, is unavailable. The patient was preoperatively evaluated, presenting advanced nasal lesions that hindered mask fit for ventilation, along with a Mallampati III classification and limited cervical extension, compromising airway management. An anesthetic approach flowchart was developed, including pre-oxygenation after applying an occlusive dressing to the nasal area. For intubation, a videolaryngoscope, Bougie, and, as a last resort, tracheostomy equipment were available, with a head and neck surgical team on standby in case of ventilation failure or impossible OTI. After proper positioning with interscapular and occipital cushions and 10 minutes of pre-oxygenation, anesthetic induction was performed, effective ventilation with a Guedel airway, direct laryngoscopy, and intubation assisted by the Bougie were completed without complications. Although rhinectomy is rarely discussed, this report emphasizes the importance of simple measures such as positioning, pre-oxygenation, the use of devices that optimize ventilation, and the presence of a clear protocol that ranges from less invasive techniques to tracheostomy, in collaboration with the surgical team.

**Keywords:** Nasal Neoplasms; Total Rhinectomy; Anesthesia; Airway Management; Case Report.

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## RESUMO

A rinectomia total, embora rara na prática cirúrgica, representa um grande desafio para o anestesista, especialmente na abordagem da via aérea para ventilação e intubação orotraqueal (IOT). Este relato de caso descreve os desafios e soluções adotadas em nosso serviço para realizar o procedimento, destacando alternativas quando o broncofibroscópio, padrão-ouro para IOT, não está disponível. O paciente foi avaliado previamente, apresentando lesão nasal avançada que dificultava o acoplamento da máscara para ventilação, além de classificação Mallampati III e extensão cervical limitada, comprometendo o manejo da via aérea. Foi elaborado um fluxograma para a abordagem anestésica, que inclui pré-oxigenação após curativo oclusivo na região nasal. Para a intubação, estavam disponíveis videolaringoscópio, Bougie e, como último recurso, material para traqueostomia, com equipe cirúrgica de cabeça e pescoço pronta para atuar em caso de falha na ventilação ou impossibilidade de IOT. Após posicionamento adequado com coxim interescapular e occipital e 10 minutos de pré-oxigenação, foi realizada indução anestésica, ventilação eficaz com cânula de Guedel, laringoscopia direta e intubação com auxílio do Bougie, sem intercorrências. Apesar de a rinectomia ser pouco discutida, este relato ressalta a importância de medidas simples como posicionamento, pré-oxigenação, uso de dispositivos que otimizem a ventilação e a existência de um protocolo claro, incluindo desde técnicas menos invasivas até a traqueostomia, em colaboração com a equipe cirúrgica.

**Palavras-chave:** Neoplasias nasais; Rinectomia Total; Anestesia; Manuseio Das Vias aéreas; Relato De Caso.

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## INTRODUCTION

Anesthesia in facial tumor surgeries requires careful considerations, especially regarding airway management and the choice of anesthetic technique. Airway management is critical due to potential difficulties in ventilation caused by the size and location of the tumor and in intubation due to anatomical limitations. Total rhinectomy is an uncommon procedure for treating nasal neoplasms<sup>1</sup>, usually indicated for locally advanced tumors. Consequently, there are few case reports in the scientific literature discussing ways to access and maintain airway patency while highlighting the best anesthetic strategy. This case report aims to present the challenges and solutions found for optimal airway access without a fiberoptic bronchoscope and the decision to use total intravenous anesthesia for the proposed surgery.

## ETHICAL CONSIDERATIONS

The patient provided verbal and written consent for this case report, including the use of laboratory data and images. This case report was approved by the Institutional Research Ethics Committee (CAAE 87182225.9.0000.5066).

## CASE REPORT

A 63-year-old male patient, hypertensive and a heavy smoker, 50kg, 1.50m tall underwent surgical reintervention by the head and neck surgery team due to squamous cell carcinoma. In February 2024, he had nasal tip resection and reconstruction surgery. In October of the same year, outpatient follow-up revealed recurrence and progression into bone structures, and he was referred back to the head and neck team.

At that point, the patient presented with complete destruction of the nasal pyramid and an ulcerated lesion measuring 2.4 × 3.8 × 5.6cm (volume 26.6cm<sup>3</sup>), with involvement of the left orbit and maxilla. Due to the extensive nature of the lesion and the high probability of metastasis, the team decided on total rhinectomy—including nasal bone removal and neck dissection—which was performed in November 2024.

From an anesthetic perspective, the large facial lesion significantly impaired mask seal, making ventilation difficult. During the pre-anesthetic evaluation conducted the previous month, no laboratory abnormalities were found that could compromise the procedure (hemoglobin

16.7g/dL, hematocrit 47.7%, platelets 416,000/mm<sup>3</sup>, prothrombin time [PT] 100%, and creatinine 0.75mg/dL). However, the patient was noted to have a Mallampati class III and limited cervical extension—raising the possibility of a difficult intubation.

To reduce risks and increase the chances of effective ventilation and intubation—given the absence of a fiberoptic bronchoscope—an occlusive dressing was applied to the nasal region to assist with mask fit. The surgical room was equipped with a size 4 Guedel airway, a Bougie, a size 4 laryngeal mask, and a tracheostomy kit. The patient was positioned in the sniffing position with interscapular and occipital padding and underwent 10 minutes of preoxygenation (Figure 1).

Remifentanyl 50mcg/mL in TCI mode and propofol 10mg/mL with the Fast-Marsh effect were used, guided by patient responsiveness and Bispectral Index (BIS) monitoring. After the BIS dropped below 60, rocuronium (50mg) was administered, with sugammadex available for immediate reversal if needed. After anesthetic induction, mask fit with the dressing was considered satisfactory, enabling effective ventilation with the Guedel airway. Positive capnography

confirmed that the patient could be ventilated, and an additional 3 minutes of denitrogenation were performed.

Ventilation and rocuronium administration improved cervical extension, enabling direct laryngoscopy and yielding a Cormack-Lehane grade 2b view. OTI was successfully performed using the Bougie and a 7.5mm reinforced (armored) endotracheal tube, without complications. The endotracheal tube was also secured to the oral mucosa by the head and neck surgery team, as shown in Figure 2, and ocular protection was provided. As adjuvant medications to optimize anesthesia and provide postoperative analgesia, the following were administered: lidocaine 60mg, esketamine 25mg, clonidine 75mcg, and methadone 5mg. Additionally, supportive medications included ondansetron 8mg and dexamethasone 10mg for nausea and vomiting prevention, and ketoprofen 100mg. Dipyron was not administered due to a reported allergy. During the surgical procedure, illustrated in Figure 3, no complications were observed. Extubation was performed in the operating room, and the patient had a smooth recovery.

After 48 hours of observation in the hospital, the patient was discharged with outpatient follow-up. Twenty days



**Figure 1.** Positioning in the sniffing position using an interscapular and occipital cushion prior to induction, with Bispectral Index (BIS) monitoring.

**Source:** Authors' personal archive.



**Figure 2.** Patient after endotracheal intubation (ETI), with fixation on the oral mucosa following removal of the occlusive dressing from the nasal region.

**Source:** Authors' personal archive.

after the surgical procedure, histopathological examination revealed compromised margins in the deep resection of the nasal turbinate, requiring the patient to undergo a margin enlargement procedure. A second surgical approach was performed, which revealed chronic, nonspecific inflammation with no evidence of neoplasia. The patient was then referred to radiotherapy; however, adjuvant treatment was not indicated due to the staging of the lesion. He was maintained under conservative management and referred for the fabrication of a nasal prosthesis.

## DISCUSSION

The central objective of this case report is to describe the difficulties and solutions, as well as the workflow developed—even with limited resources—for a safe airway approach in cases of extensive facial lesions, such as in patients undergoing total rhinectomy. The greatest challenges faced by anesthesiologists in these situations are difficulties with ventilation and predictors of difficult intubation. In “can't intubate–can't ventilate” situations, it is crucial to determine



**Figure 3.** Pre-extubation, after total rhinectomy.

**Source:** Authors' personal archive.

which drugs and strategies are ideal for achieving good anesthetic and surgical outcomes, using the available tools.

Regarding the anesthetic technique, total intravenous anesthesia using rocuronium was considered the most appropriate for this procedure. In cases with difficult ventilation and intubation, the use of drugs with rapid clearance—such as remifentanyl and propofol—helps minimize apnea time. Rocuronium was chosen as the neuromuscular blocker due to its unique feature of having a specific reversal agent (sugamadex), making induction safer and facilitating rescue if necessary. Besides being associated with smoother emergence, this technique also has a lower risk of postoperative nausea and vomiting in nasal surgeries compared to inhalation anesthesia<sup>2,3</sup>.

The incidence of “can't intubate–can't ventilate” scenarios is low, ranging from approximately 0.01% to 0.07%<sup>4</sup>. Nevertheless, such procedures demand a concise action plan to avoid catastrophic outcomes<sup>5</sup>.

For airway management in this patient, a workflow was established between the anesthetic and surgical teams for induction preparation, taking into account the limited resources. The first step was to position the patient in the sniffing position to align the oral, pharyngeal, and tracheal axes. An occlusive dressing was also applied to the nasal lesion to improve mask fit and facilitate oral ventilation. Preoxygenation before anesthetic induction was essential, as it prolonged the safe apnea time and allowed

the team to implement the established workflow without significant desaturation.

Readily accessible rescue devices were another key point, including the Guedel airway to optimize mask ventilation and the size 4 laryngeal mask in case ventilation was unsuccessful even with the dressing. After confirming effective ventilation, 3 more minutes of denitrogenation were performed.

As mentioned, the workflow for achieving a definitive airway was jointly developed with the head and neck surgery team. It included direct laryngoscopy after improved cervical extension from the neuromuscular blocker. If this failed, a videolaryngoscope would be used to improve glottic visualization and reduce the risk of failure<sup>6</sup>. A Bougie was available as a guide. The surgical team remained on standby with tracheostomy materials, as this would be the final option for securing the airway in a “can’t ventilate–can’t intubate” scenario. According to current protocols<sup>7</sup>, this strategy helps prevent catastrophic outcomes such as severe hypoxemia, brain damage, or even patient death.

## CONCLUSION

Although total rhinectomy is rarely discussed in the medical literature, the measures presented in this case report can be adapted to facial lesion cases where “can’t ventilate–can’t intubate” scenarios are anticipated. The anesthetic approach using total intravenous anesthesia and rocuronium proved to be a safer option due to the fast clearance and complete reversal of neuromuscular blockade with sugammadex. It also provided smoother emergence and reduced the risk of undesirable postoperative effects such as nausea and vomiting.

Regarding airway management, it is essential to emphasize the importance of basic measures such as proper positioning and preoxygenation, which make the apnea period safer for the patient. Establishing a well-defined flowchart in collaboration with both the anesthetic and surgical teams, based on the devices available at each facility, and carefully evaluating all possible approaches are other key factors in achieving favorable outcomes and avoiding adverse events.

## AUTHORS’ CONTRIBUTION:

We describe contributions to the papers using the taxonomy (CRediT) provided above: *Conceptualization, Investigation, Methodology, Visualization & Writing – review & editing*: KR Pasolini; SF Xavier. *Project administration, Supervision & Writing – original draft*: KR Pasolini; SF Xavier. *Resources & Funding acquisition*: KR Pasolini; SF Xavier. *Data curation & Formal Analysis*: KR Pasolini; SF Xavier.

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