International Journal of Otorhinolaryngology and Head and Neck Surgery
Murugesan A et al. Int J Otorhinolaryngol Head Neck Surg. 2026 Jun;12(3):xxx-xxx
https://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20261483

Case Report

Awake airway management for retrograde injection laryngoplasty in a high-risk oncologic patient with severe trismus: a case report

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Received: 07 April 2026
Revised: 13 May 2026
Accepted: 16 May 2026

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ABSTRACT

Advanced head and neck malignancies often present with complex airway and systemic challenges that critically influence anesthetic management. We report a high-risk patient with carcinoma of the tonsil and widespread metastases who had a prior history of pseudoaneurysm rupture of facial artery treated with embolization, complicated by intra-procedural cardiac arrest, atrial fibrillation, and subsequent dialysis-dependent acute renal failure. The patient later presented with unilateral vocal cord palsy requiring injection laryngoplasty. Severe trismus, compromised pulmonary reserve due to metastatic disease, and underlying cardiac dysfunction rendered general anesthesia particularly hazardous. An awake airway approach using 4% lignocaine nebulization, trans-tracheal block, and dexmeditomidine sedation was employed to maintain spontaneous ventilation while providing optimal procedural conditions. This enabled successful completion of the shared airway procedure using a retrograde technique without complications. This case highlights the importance of individualized anesthetic strategies in high-risk oncologic patients and underscores the value of regional airway anesthesia combined with conscious sedation as a safe alternative to general anesthesia.

Keywords: Trismus, Carcinoma tonsil, Retrograde injection, Larynogoplasty, Regional anaesthesia, Conscious sedation

INTRODUCTION

Airway management in patients with advanced head and neck malignancies remains a significant anesthetic challenge, particularly when compounded by systemic comorbidities and anatomical distortion secondary to prior radiation, fibrosis, and tumor burden. These factors often result in restricted mouth opening, altered airway landmarks, and reduced tissue compliance, all of which increase the risk of difficult mask ventilation and intubation. Injection laryngoplasty is generally considered a short, minimally invasive procedure performed under controlled conditions, however, in the presence of severe trismus and compromised physiological reserve, even such procedures require meticulous preoperative planning and a tailored anesthetic approach.[1] In patients with limited pulmonary reserve due to metastatic disease and coexisting cardiac dysfunction, the margin for error is narrow, and the consequences of apnea or failed airway control can be catastrophic.

Under these circumstances, preservation of spontaneous ventilation becomes a cornerstone of safe anesthetic management. Additionally, shared airway procedures further complicate decision-making, necessitating close coordination between the anesthesiology and surgical teams to ensure both airway safety and optimal surgical

access.[2] Awake airway techniques, incorporating regional airway anesthesia and judicious sedation, provide a valuable alternative to conventional general anesthesia in such high-risk scenarios. These approaches allow maintenance of airway reflexes, continuous patient cooperation, and real-time neurological and respiratory assessment, thereby minimizing the risk of hypoxia and hemodynamic instability.

CASE REPORT

A 58-year-old male with a known diagnosis of carcinoma tonsil presented with progressive disease despite undergoing multiple cycles of chemotherapy. The disease had advanced with metastases to the lungs and liver, with imaging demonstrating extensive pulmonary involvement.[3] The patient had previously developed a pseudoaneurysm of the facial artery that ruptured, necessitating emergency embolization. During the embolization procedure, the patient suffered a cardiac arrest but was successfully resuscitated. The post-resuscitation period was complicated by atrial fibrillation and acute renal failure, for which he required dialysis.[4] Renal function subsequently improved with supportive management, although it remained borderline. The patient later developed left vocal cord palsy, manifesting as hoarseness of voice and increased risk of aspiration. He was scheduled for injection laryngoplasty to improve glottic competence and improve quality of life as requested by himself.

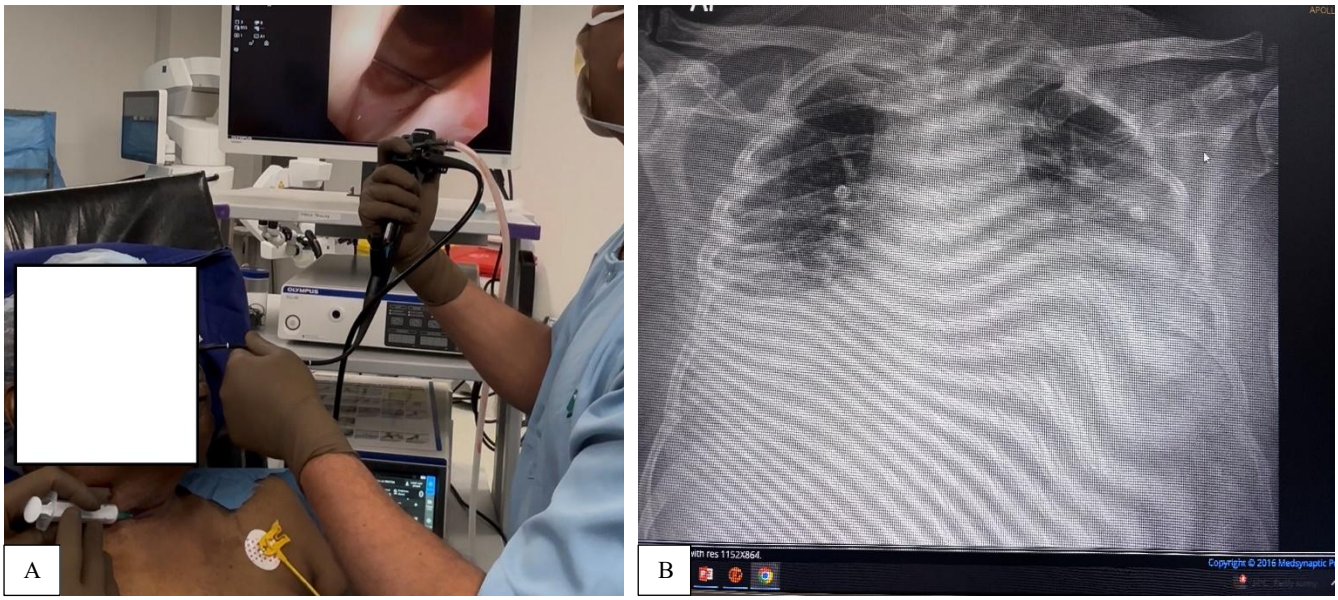

Figure 1: (A) Patient is awake and procedure being done and (B) X-ray showing extensive involvement due to metastases.

Preoperative evaluation revealed severe trismus with near-complete restriction of mouth opening, significantly limiting conventional airway access. Respiratory assessment indicated poor pulmonary reserve attributable to extensive lung metastases.[5] Cardiovascular evaluation demonstrated an ejection fraction of 50% with regional wall motion abnormalities, along with controlled atrial fibrillation. Laboratory investigations were borderline within acceptable limits, considering the patient's clinical status. Despite the elevated risk, both cardiology and nephrology teams deemed the patient fit for the procedure under high-risk consent.

Diagnostic assessment

The presence of extensive pulmonary metastases significantly reduced respiratory reserve, increasing the risk of hypoxia during apnea or general anesthesia. Severe trismus indicated an anticipated difficult airway with limited options for conventional laryngoscopy or intubation. Cardiac findings of regional wall motion abnormalities and atrial fibrillation suggested a reduced tolerance to hemodynamic fluctuations. Renal impairment further complicated drug selection and dosing. Collectively, these findings indicated that general anesthesia with endotracheal intubation would carry substantial risk.

Therapeutic intervention

In view of the anticipated airway difficulty and systemic compromise, an awake anesthetic approach was planned.[6] The primary objective was to maintain spontaneous ventilation while providing adequate conditions for a shared airway procedure. Preoperative preparation included standard monitoring and readiness for emergency airway access, including tracheostomy.[7] Airway anesthesia was achieved using 4% lignocaine nebulization, which provided topical anesthesia to the upper airway and reduced airway reflexes. This was supplemented with a trans-tracheal block administered via the cricothyroid membrane, ensuring effective

anesthesia of the vocal cords and trachea.[8] Intravenous dexmeditomidine was used for sedation at a dose of 1mcg/kg bolus over 20 minutes followed by 0.5mcg/kg/hr. as maintenance dose, allowing the patient to remain calm and cooperative without significant respiratory depression.[9] Given the presence of absolute trismus, a retrograde technique was employed for injection laryngoplasty. The combination of adequate airway anesthesia and sedation facilitated complete immobility and patient comfort while preserving spontaneous respiration. The shared airway was managed effectively without the need for endotracheal intubation or airway instrumentation that could compromise ventilation (Figure 1).

Follow-up and outcomes

The procedure was completed successfully without intraoperative complications. The patient maintained stable hemodynamics and adequate oxygenation throughout. Postoperatively, there was no evidence of respiratory compromise or worsening renal function. The patient demonstrated improvement in voice quality and a reduction in aspiration symptoms. No delayed complications were observed during follow-up.

DISCUSSION

This case illustrates the importance of tailoring anesthetic management to the unique challenges presented by advanced oncologic disease. General anesthesia was considered high risk in this patient due to the combination of poor pulmonary reserve, difficult airway, and cardiac dysfunction. Induction of anesthesia and loss of spontaneous ventilation could have precipitated rapid desaturation and hemodynamic instability. Endotracheal intubation, particularly with small microlaryngeal tubes, would have increased airway resistance and required controlled ventilation, which may not have been well tolerated. Alternative techniques such as transnasal humidified rapid insufflation ventilatory exchange and intermittent apneic oxygenation were considered but deemed suboptimal in this setting due to the risk of carbon dioxide retention and limited tolerance to apnea.[10] The use of devices such as a ventilating bougie was also impractical given the severity of trismus.[11] The awake approach allowed preservation of spontaneous ventilation while minimizing airway manipulation. Nebulized lignocaine and trans-tracheal block provided effective airway anesthesia, while dexmeditomidine ensured cooperative sedation without respiratory compromise. This combination proved particularly advantageous in a shared airway scenario, allowing the surgeon to perform the procedure without interference.

CONCLUSION

Awake airway management using regional airway anesthesia in combination with dexmeditomidine sedation represents a safe, pragmatic, and highly effective strategy in high-risk oncologic patients with anticipated difficult airway and significant systemic compromise. In such patients, conventional general anesthesia may precipitate loss of airway control, hemodynamic instability, and an inability to tolerate even brief periods of apnea. An awake technique, by contrast, allows maintenance of spontaneous ventilation, preservation of airway reflexes, and continuous assessment of respiratory and neurological status throughout the procedure. The use of targeted regional airway blocks—such as topicalization, nebulization, and transtracheal anesthesia—ensures adequate airway anesthesia while minimizing the need for deep sedation.

Dexmeditomidine, with its unique sedative, analgesic, and sympatholytic properties, provides cooperative sedation without significant respiratory depression, making it particularly well-suited for such scenarios. This combination not only enhances patient comfort and tolerance but also maintains cardiovascular stability, which is crucial in patients with limited physiological reserve. Furthermore, awake airway management is especially advantageous in shared airway procedures such as injection laryngoplasty, where both anesthesiologist and surgeon must work simultaneously within a confined and potentially unstable airway. By allowing airway instrumentation under deep anesthesia and ensuring patient cooperation, this technique facilitates optimal surgical conditions while significantly reducing perioperative risk. Overall, this approach underscores the importance of individualized, physiology-driven anesthetic planning and highlights the role of awake techniques as a cornerstone in the management of complex head and neck oncologic cases.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Murugesan A, Tanjore S, Mohan PR, Ramalingam S, Vidhyadharan S, Duarah S, et al. Awake airway management for retrograde injection laryngoplasty in a high-risk oncologic patient with severe trismus: a case report. Int J Otorhinolaryngol Head Neck Surg 2026;12:xxx-xx.