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### RESEARCH ARTICLE

## ANESTHETIC CHALLENGE IN A PATIENT WITH COMPRESSIVE CERVICAL CHORDOMA: A CASE REPORT

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### Abstract

Compressive cervical chordoma is a rare, high-risk anesthetic situation because tumor-related distortion of the upper airway, proximity to neurovascular structures, and postoperative airway edema may make both intubation and extubation difficult. We report the case of a 73-year-old patient with a large left anterior cervical mass causing progressive dysphagia, dysphonia, hoarseness, and deviation of the aerodigestive tract. Cervical imaging showed a lesion invading the C6 vertebral body, associated with grade II vertebral collapse and extension into the left lateral cervical soft tissues. After multidisciplinary discussion with the neurosurgical team, an anticipated difficult-airway strategy was adopted. Topical airway preparation was performed with nasal naphazoline, nebulized 5% lidocaine, and oropharyngeal lidocaine gel. Airway nerve blocks were avoided because of markedly distorted anatomical landmarks. Awake nasotracheal intubation was achieved under flexible fiberoptic guidance after conscious sedation with midazolam 2 mg and titrated ketamine to a total dose of 100 mg, while spontaneous ventilation was preserved. Once tracheal intubation had been confirmed visually and by capnography, general anesthesia was completed with fentanyl 200 micrograms, propofol 100 mg, and rocuronium 50 mg. Anesthesia was maintained with age-adjusted sevoflurane at approximately 1 minimum alveolar concentration. Continuous invasive blood pressure monitoring was used, with a target mean arterial pressure of at least 80 mmHg. The intraoperative course was uneventful.

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Extubation was planned as a second critical step and was performed after full recovery, effective spontaneous ventilation, quantitative neuromuscular monitoring, and reversal with sugammadex 200 mg. This case highlights the value of imaging-based preoperative planning, preservation of spontaneous ventilation during airway control, limitation of cervical movement, preparation of a backup invasive-airway strategy, and structured extubation planning in patients with compressive cervical tumors.

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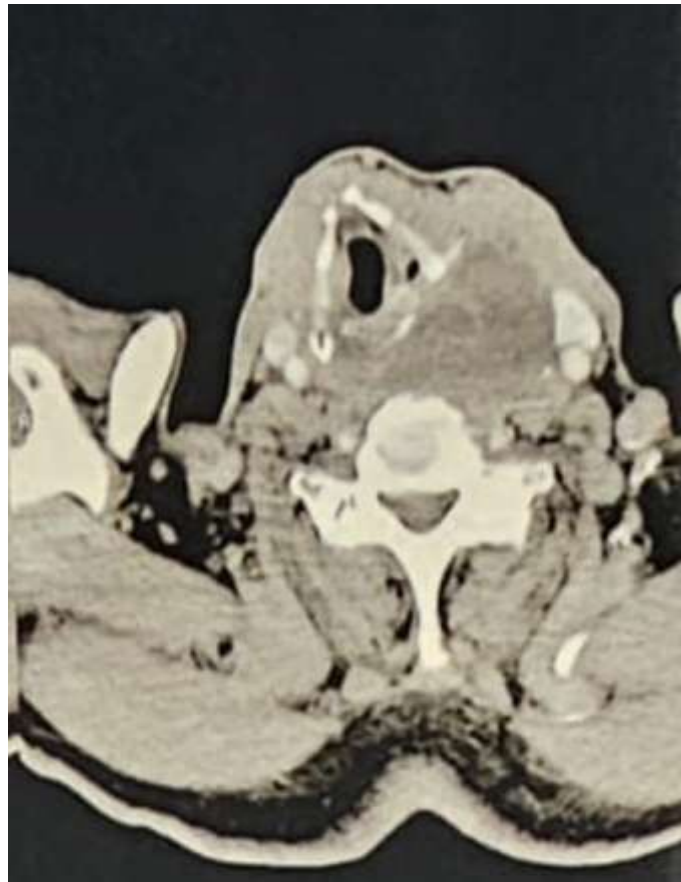
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**Introduction:-**

Chordoma is a rare malignant tumor arising from remnants of the embryonic notochord. It usually grows slowly but remains locally aggressive, with a marked tendency for bone and soft-tissue invasion. Cervical spine involvement is considerably less frequent than sacrococcygeal and skull-base disease [5]. In compressive cervical forms, the anesthesiologist must anticipate difficult airway management, limit cervical spine movement, preserve cerebral and spinal cord perfusion, and plan extubation before induction of anesthesia. The anesthetic strategy must therefore be individualized, multidisciplinary, and guided by clinical examination, imaging findings, surgical objectives, and current difficult-airway recommendations [1,4,8].

**Case Presentation:-**

A 73-year-old patient was admitted for surgical management of a left anterior cervical mass that had evolved over approximately eight months. The clinical presentation included progressive dysphagia, dysphonia with hoarseness, moderate impairment of general condition, and intermittent vertigo associated with right-sided hearing loss. Medical history included an ischemic stroke two years earlier and former smoking. No previous surgical history was reported. Cervical computed tomography and magnetic resonance imaging revealed a tumor invading the C6 vertebral body, associated with grade II vertebral collapse and extension into the left lateral cervical soft tissues. The mass measured approximately 45 x 41 mm, with a craniocaudal extension of 59 mm, and displaced the aerodigestive tract. Additional cervicothoracic imaging confirmed a large left anterolateral mass deviating the laryngotracheal axis while leaving a residual patent airway lumen (Figures 1 and 2).



**Figure 1. Axial cervical computed tomography scan at the level of the cervical mass showing a large left anterior cervical lesion, marked mass effect, rightward deviation of the laryngotracheal axis, and eccentric narrowing of the tracheal lumen. The residual airway remains patent despite significant extrinsic compression.**



**Figure 2. Sagittal cervical magnetic resonance image showing a tumor centered at the C6 vertebral level, with vertebral body involvement, heterogeneous signal intensity, anterior and lateral soft-tissue extension, mass effect, and displacement of the aerodigestive tract.**

After multidisciplinary discussion between the anesthesia and neurosurgical teams, the patient was considered to have an anticipated difficult airway. The main objective was to secure the airway before deepening anesthesia, while maintaining spontaneous ventilation and preserving neurological safety. Difficult-airway equipment was prepared, and emergency surgical airway access was discussed with the surgical team as the rescue strategy in case of failed or impossible intubation. In the operating room, standard monitoring was applied and supplemental oxygen was administered. Topical airway anesthesia was performed with nasal naphazoline, nebulized 5% lidocaine, and oropharyngeal lidocaine gel. Airway nerve blocks were not performed because the tumor had distorted the usual anatomical landmarks. Conscious sedation was administered with midazolam 2 mg intravenously, followed by titrated ketamine to a total dose of 100 mg intravenously, while maintaining spontaneous ventilation and patient cooperation.

Awake nasotracheal intubation was performed under flexible fiberoptic guidance using a reinforced endotracheal tube with an internal diameter of 6.5 mm. After visual confirmation of tracheal placement and continuous capnographic confirmation, anesthesia was completed with fentanyl 200 micrograms intravenously, propofol 100 mg intravenously, and rocuronium 50 mg intravenously. Anesthesia was maintained with age-adjusted sevoflurane at approximately 1 minimum alveolar concentration in an air-oxygen mixture. A radial arterial catheter was inserted for continuous invasive blood pressure monitoring. A target mean arterial pressure of at least 80 mmHg was selected because of the history of ischemic stroke and the cervical surgical context involving major vascular structures. Blood products were prepared in advance. Surgery was performed in the supine position with slight head rotation to

the right, avoiding excessive cervical extension. The intraoperative course was uneventful, with no desaturation, respiratory event, or major hemodynamic instability.

At the end of surgery, extubation was considered a second critical phase. After full awakening, effective spontaneous ventilation, quantitative train-of-four monitoring confirming neuromuscular recovery, and reversal with sugammadex 200 mg intravenously, extubation was performed under controlled conditions. The patient was transferred to the post-anesthesia care unit and subsequently to the ward after achieving an Aldrete score greater than 9. Table 1 summarizes the perioperative strategy and immediate outcome.

**Table 1. Summary of the anesthetic management strategy and perioperative outcome in this case**

Step	Key elements
Anticipation	Anticipated difficult airway; multidisciplinary discussion with neurosurgery; difficult-airway equipment prepared; emergency surgical airway access discussed as rescue strategy.
Topicalization	Nasal naphazoline, nebulized 5% lidocaine, and oropharyngeal lidocaine gel; airway nerve blocks avoided because of distorted anatomical landmarks.
Sedation	Midazolam 2 mg IV followed by titrated ketamine to a total dose of 100 mg IV, with preservation of spontaneous ventilation.
Intubation	Awake nasotracheal intubation under flexible fiberoptic guidance; reinforced endotracheal tube with 6.5-mm internal diameter.
After airway control	Fentanyl 200 micrograms IV, propofol 100 mg IV, and rocuronium 50 mg IV.
Maintenance	Age-adjusted sevoflurane at approximately 1 minimum alveolar concentration in an air-oxygen mixture.
Monitoring	Standard monitoring plus radial arterial catheter; target mean arterial pressure at least 80 mmHg.
End of procedure and outcome	Quantitative neuromuscular monitoring; sugammadex 200 mg IV; extubation after full recovery; transfer to the ward after an Aldrete score greater than 9.

### Discussion:-

Cervical chordoma is a rare notochordal tumor whose severity is related more to local aggressiveness than to growth rate. Its close anatomical relationships with the spinal cord, nerve roots, carotid arteries, vertebral arteries, and upper airway make both surgical and anesthetic management complex. Involvement of the mobile spine is uncommon, which explains the limited number of anesthesia-focused reports in the literature [3,5]. Treatment is primarily surgical when complete or maximal safe resection is feasible, often as part of a multimodal strategy. In cervical locations, surgery may be indicated for symptomatic, compressive, unstable, or progressive lesions; however, resection remains technically challenging because of the proximity of neural and vascular structures [3,8]. Our patient presented with progressive dysphagia, dysphonia, and hoarseness. These symptoms are consistent with previously reported cervical chordomas with retropharyngeal or upper aerodigestive extension, in which airway or voice symptoms may precede neurological manifestations [13]. Radiological analysis was central to anesthetic planning. Imaging demonstrated a large left anterolateral mass deviating the aerodigestive tract and laryngotracheal axis, with eccentric airway narrowing. The residual tracheal lumen suggested that intubation could be feasible if performed under direct visualization while spontaneous ventilation was preserved [11].

Table 2 compares the present case with selected reports that are particularly relevant to airway evaluation and airway management in cervical chordoma.

**Table 2. Comparison with selected reported cervical chordoma cases relevant to airway management**

Report	Main airway or anesthetic issue	Relevance to the present case
Nicoucar et al. [13]	Cervical chordoma with retropharyngeal extension and impaired voice.	Supports careful assessment of dysphonia, hoarseness, swallowing difficulty, and upper aerodigestive symptoms as warning signs.
Chen et al. [7]	Retropharyngeal cervical chordoma in which fiberoptic manipulation alone was insufficient for tube advancement; an alternative intubation device was required.	Shows that passage of the bronchoscope does not always guarantee passage of the endotracheal tube through a compressed or deviated airway; backup plans are essential.
Han et al. [10]	Anesthesia management for cervical chordoma resection with emphasis on preoperative assessment and airway planning.	Supports multidisciplinary and imaging-guided preparation before induction of anesthesia.
Present case	Large left anterolateral cervical mass with laryngotracheal deviation, patent residual lumen, prior ischemic stroke, and planned high-risk extubation.	Awake fiberoptic nasotracheal intubation with preserved spontaneous ventilation, invasive hemodynamic monitoring, and structured extubation planning provided a safe immediate outcome.

Current difficult-airway guidelines recommend awake tracheal intubation when conventional induction may cause loss of airway control or when difficult ventilation, difficult intubation, or aspiration risk is anticipated [1,4]. In the present case, airway nerve blocks were not feasible because anatomical landmarks were altered by the tumor. We therefore used noninvasive topical airway anesthesia combined with cautious sedation, and awake fiberoptic nasotracheal intubation was performed while spontaneous ventilation was maintained. A rescue strategy involving emergency surgical airway access had been established with the surgical team. Endotracheal tube selection was guided by the estimated residual airway caliber on imaging. In the absence of precise DICOM-based measurements, a semiquantitative assessment was used. A reinforced 6.5-mm internal diameter tube was chosen as a compromise between ease of passage and adequate ventilation. Tube choice should also take outer diameter into account, because it directly affects passage through narrowed airways and may influence airway trauma [2,9].

Beyond airway management, cervical chordoma surgery exposes patients to potential bleeding, vascular compromise, and positioning-related complications. In our patient, previous ischemic stroke justified strict avoidance of hypotension. Continuous arterial monitoring and a target mean arterial pressure of at least 80 mmHg were used to support cerebral and spinal cord perfusion. Cervical positioning and anterior cervical surgical manipulation may influence carotid and vertebral blood flow, particularly in vulnerable patients [6,14]. Extubation should be treated as a planned, high-risk phase rather than as a routine endpoint. Difficult Airway Society guidance recommends a structured approach to at-risk extubation, with preparation for reintubation and post-extubation monitoring. In our case, quantitative neuromuscular monitoring and sugammadex reversal were used to reduce the risk of residual neuromuscular blockade, airway obstruction, and postoperative respiratory complications [12,15,16].

### Conclusion:-

Compressive cervical chordoma can create a major anesthetic challenge because of airway distortion, potential spinal involvement, and neurovascular risk. In this case, detailed radiological assessment, awake fiberoptic intubation with preserved spontaneous ventilation, hemodynamic optimization, and planned extubation with quantitative neuromuscular monitoring contributed to a safe immediate perioperative outcome. This case supports a proactive, multidisciplinary, and individualized strategy for patients with cervical compressive tumors.

### Author Statement:-

**Conflict of Interest Statement:** The authors declare that they have no competing interests.

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**Consent for Publication:** Written informed consent for publication of the anonymized clinical information and images was obtained from the patient and is retained by the authors.

**Ethical Approval:** Formal ethical approval was not applicable to this anonymized single-patient case report because no research intervention or experimental protocol was undertaken.

**Author Contributions:** All authors contributed to perioperative patient management, manuscript preparation, critical revision, and approval of the final version.

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