Case Report: Anaesthetic Management of a 45-Year-Old Male with Squamous Cell Carcinoma of the Left Lateral Border of the Tongue

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Abstract: Carcinoma of the tongue presents unique challenges to the Anaesthesiologist, primarily centred around airway management, shared airway dynamics, and hemodynamic stability. We report the anaesthetic management of a 45-year-old male with moderately differentiated squamous cell carcinoma of the left lateral border of the tongue scheduled for wide local excision (partial hemiglossectomy), ipsilateral selective neck dissection, marginal mandibulectomy and radial forearm flap reconstruction. The primary anaesthetic focus was securing a difficult airway via awake fibreoptic intubation (FOI), managing a shared intraoperative surgical field, and managing acute postoperative pain while ensuring a smooth emergence to protect the surgical site. [1]

Key words: hemodynamic stability, mandibulectomy, transtracheal route, fibreoptic.

Case Presentation:

1. Preoperative Evaluation and Preparation

- **Patient Profile:** A 45-year-old male, weighing 68 kg, presenting with an ulcer proliferative mass on the left lateral border of the tongue.
- **Airway Examination:** Modified Mallampati Class III, thyromental distance of 6.2 cm, and adequate mouth opening (inter-incisor distance of 3.5 cm). The tongue lesion was tender, friable, and restricted full lateral protrusion of the tongue. No structural shifting of the larynx or trachea was noted on the neck radiograph or CT scan. [2]
- **Systemic Review:** Cardiovascular and respiratory systems were within normal parameters. Preoperative laboratory investigations, including complete blood count, coagulation profile, and renal and liver function tests, were within normal limits.
- **Premedication:** The patient was kept *Nil per oral* (NPO) for 8 hours. Glycopyrrolate 0.2 mg was administered intramuscularly 45 minutes before surgery

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to minimize oral secretions and optimize the visual field for fibre optic bronchoscopy.

2. Airway Management and Induction

An awake nasal fibre optic intubation was planned due to the risk of tumour friability, bleeding, and potential airway distortion during conventional laryngoscopy.

- **Airway Preparation:** The nasal mucosa was prepared with 4% xylocaine drops mixed with 0.05% oxymetazoline for vasoconstriction. The oral cavity and posterior pharyngeal wall were topicalized using 10% lignocaine spray. A superior laryngeal nerve block was performed bilaterally using 2 mL of 2% lignocaine, and an airway block via the transtracheal route (4 mL of 2% lignocaine) was executed to suppress the cough reflex.
- **Procedure:** Under conscious sedation with a titrated intravenous infusion of dexmedetomidine 50 mcg over 10 minutes, a flexible fibreoptic bronchoscope was introduced through the right nostril. The vocal cords were visualized, and a size 7.0 mm cuffed armoured endotracheal tube was smoothly advanced into the trachea. Tube placement was confirmed via waveform capnography and bilateral chest auscultation.
- **Induction & Maintenance:** General anaesthesia was induced with propofol 120 mg and fentanyl 50 mg. Vecuronium 6 mg was administered to facilitate muscle relaxation once the airway was definitively secured. Maintenance was achieved using sevoflurane in an oxygen-nitrous oxide mixture (50:50) and intermittent doses of vecuronium.

3. Intraoperative Management

- **Monitoring:** Standard American Society of Anaesthesiologists (ASA) monitoring was utilized, including ECG, non-invasive blood pressure, pulse oximetry (SpO2), end-tidal carbon dioxide (EtCO2), and temperature. Invasive arterial blood pressure was monitored via the right radial artery for beat-to-beat hemodynamic mapping and arterial blood gas (ABG) sampling.
- **Surgical Challenges:** A throat pack was placed to prevent blood and surgical debris from draining into the stomach or tracking down the trachea. Close communication was maintained with the surgical team to avoid accidental circuit disconnection or tube displacement during tongue manipulation and neck dissection.

- **Fluid Management:** Fluid balance was maintained using balanced salt solutions to avoid fluid overload, which could aggravate tissue edema at the surgical site. Total blood loss was estimated at 350 mL and replaced appropriately.

4. Postoperative Extubation and Analgesia

- **Emergence:** At the conclusion of the 4-hour surgery, the throat pack was removed, and thorough, gentle upper airway suctioning was performed under direct vision to clear residual blood.
- **Analgesia & Antiemesis:** Multimodal analgesia was provided using paracetamol 1 g intravenously every 8 hours, combined with an ultrasound-guided bilateral superficial cervical plexus block using 0.25% bupivacaine for the neck dissection site. Ondansetron 4 mg was administered intravenously to prevent postoperative nausea and vomiting (PONV).
- **Extubation:** Neuromuscular blockade was reversed using neostigmine 2.5 mg and glycopyrrolate 0.5 mg. Once the patient was fully awake, obeying commands, and displaying adequate airway reflexes and respiratory muscle power, he was extubated in a sitting position to reduce upper airway oedema. He was transferred to the High Dependency Unit (HDU) for close observation.
- After 2weeks all sutures are removed, 18 No Nasogastric tube placed for feeding and discharged with advice to follow up with radiation oncologist for concurrent chemoradiation. Patient is doing well after complete treatment.

Anaesthetic Implications for Head and Neck Oncosurgery

When preparing this case report for submission to an Indian journal, the discussion must emphasize the specific anaesthetic considerations associated with head and neck oncology within this demographic:

1. The Anticipated Difficult Airway [3]

Carcinoma of the lateral border of the tongue can significantly impair tongue mobility, leading to limited submandibular compliance and distortion of the airway anatomy. Conventional direct laryngoscopy risks tumour tissue trauma, inducing severe bleeding, tumour fragmentation, or laryngospasm. Awake fibreoptic intubation remains the gold standard choice. Anaesthesiologists practicing in resource-constrained or rural Indian settings must also be adept at alternative backup plans, including video laryngoscopy or a primary surgical tracheostomy under local anaesthesia if fibreoptic

technology is unavailable. [4]

2. Shared Airway and Tube Safety

The surgical field is completely shared between the surgeon and the anaesthesiologist.

- **Armoured (Flexo metallic) Tubes:** Essential to prevent kinking or compression when surgical retractors (such as a Boyle-Davis or Jennings mouth gag) are applied to optimize oral exposure.
- **Securing the Tube:** The nasal endotracheal tube must be anchored securely to prevent accidental extubation or migration during radical neck positioning (hyperextension and lateral rotation).

3. Cardiovascular Reflexes during Neck Dissection

Surgical dissection around the carotid triangle (Level II and III lymph nodes) carries a high risk of stimulating the **carotid sinus**. This mechanical manipulation can trigger sudden, severe bradycardia, arrhythmias, or profound hypotension.

The anaesthesiologist must maintain high vigilance during this surgical phase. Treatment involves immediately alerting the surgeon to halt manipulation, ensuring adequate anaesthetic depth, and administering intravenous atropine (0.6 mg) if the reflex bradycardia persists.

4. Postoperative oedema and Airway Protection

Extensive surgical manipulation of the tongue, combined with standard radical neck lymphatic clearance, impairs local venous and lymphatic drainage. This leads to rapid, progressive postoperative tissue oedema of the floor of the mouth and larynx.

- **Extubation Criteria:** Extubation must be deferred until the patient is fully awake, exhibits excellent airway reflexes, and has met strict respiratory criteria.
- **Positioning:** Keeping the patient in a propped-up or semi-Fowler’s position postoperatively minimizes gravitational tissue edema.
- **Emergency Readiness:** A difficult airway cart, including fresh laryngoscopes, supraglottic airway devices, and a tracheostomy set, must remain at the patient's bedside during the immediate postoperative period.

5. Co-morbidities and Demographics in the Indian Context

In India, oral malignancies are strongly associated with habits such as commercial cigarette smoking, *bidi* smoking, and the use of smokeless tobacco variants like *gutka* or *khaini*. Patients often present with concurrent chronic obstructive pulmonary disease (COPD), chronic bronchitis, or varying degrees of oral submucous fibrosis (OSMF), which further narrows the inter-incisor gap. Preoperative optimization must include chest physiotherapy, bronchodilator therapy, and strict lifestyle cessation counselling. [5, 6, 7]

Conclusion

The anaesthetic management of oral tongue carcinoma depends on meticulous airway planning, structured systemic monitoring, and anticipating sudden autonomic reflexes during surgical dissection. Utilizing awake fibreoptic nasal intubation ensures airway control without disrupting the structural integrity of a friable tumour, while a planned, smooth emergence in a controlled environment mitigates the risks of acute airway obstruction.

Key Learning Points

- **Anticipate Airway Traumas:** Avoid force-induced direct laryngoscopy on friable tongue ulcers; favor awake fibreoptic or video-assisted options.
- **Manage Reflexes:** Be prepared for sudden vagal bradycardia during level II/III cervical lymph node clearance.
- **Plan the Emergence:** Postoperative local tissue oedema can cause rapid airway failure; execute extubation only when the patient is fully awake and sitting upright.

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