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Dr. Reshma P
Postgraduate, Department of
Anaesthesiology, Saveetha
Medical College and Hospital,
Saveetha Nagar, Thandalam,
Chennai, Tamil Nadu, India

Dr. Robin Manidas
Postgraduate, Department of
Anaesthesiology, Saveetha
Medical College and Hospital,
Saveetha Nagar, Thandalam,
Chennai, Tamil Nadu, India

Dr. Senthil KS
Assistant Professor,
Department of
Anaesthesiology, Saveetha
Medical College and Hospital,
Saveetha Nagar, Thandalam,
Chennai, Tamil Nadu, India

Dr. Lakshmi R
Professor, HOD, Department
of Anaesthesiology, Saveetha
Medical College and Hospital,
Saveetha Nagar, Thandalam,
Chennai, Tamil Nadu, India

Anaesthesia management for total laryngectomy in CA larynx with TEP insertion: Case report

Dr. Reshma P, Dr. Robin Manidas, Dr. Senthil KS and Dr. Lakshmi R

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Abstract

The airway is not only shared but operated upon during laryngeal cancer surgery. Patients with laryngeal cancer require general anaesthesia for major cancer resectional surgery. This review outlines the importance of careful assessment of the airway and medical comorbidities and discusses the options for anaesthetic and ventilatory management whilst ensuring a safe airway, adequate oxygenation and the best possible view of the surgical field.

Keywords: Head and neck cancer surgery, prosthesis, tracheostomy

Introduction

Laryngeal carcinoma is the most frequent head and neck cancers. Supraglottic and glottic tumors are the most prominent subsites whereas subglottic carcinomas occur uniformly rare. > 90% of laryngeal cancers are squamous cell carcinomas (SCC). M:F ratio is 4:1. Smoking is the predominant risk factor, with alcohol use being an independent and synergistic effect. Difficult airway and multiple medical comorbidities combined with necessity to share the airway with surgical team poses many challenges to the anaesthetist both in term of difficult mask ventilation and tracheal intubation. This is further complicated by laryngeal radiation therapy-induced fibrosis and reduced mobility of the surrounding tissues. It is therefore important to formulate an appropriate anaesthetic management plan. Functional rehabilitation of these patients has been one of the major challenges faced.

Case Report

A 45yr old male, came with complaints of hoarseness of voice & difficulty in speaking and swallowing for 5 months. No history of breathing difficulty, sore throat, specific ear or nose complaints.

Not a known case of any co-morbidities.

History of voice abuse present, since he is flower vendor by profession. Not a smoker/alcoholic.

History of microlaryngeal surgery with biopsy done in outside hospital 4 months ago under general anaesthesia and revealed SCC grade II.

Vital signs were normal.

Examination of central nervous system, cardiovascular and respiratory system revealed no gross abnormality. Local examination revealed - no palpable neck nodes, Larynx appears expanded, Laryngeal crepitus present, No stridor. Airway examination revealed adequate mouth opening, MMP 2, TMD > 3 fingers, neck movements adequate.

All blood investigations were within normal limits & COVID report negative.

VL scopy was done in ENT OPD and findings included ulcero proliferative growth involving Left supraglottis, glottic space, ventricle, false cord, true cord, anterior commissure & sub glottis. Left vocal cord appears to be fixed. Right vocal cord & false cord appears edematous and mobile.

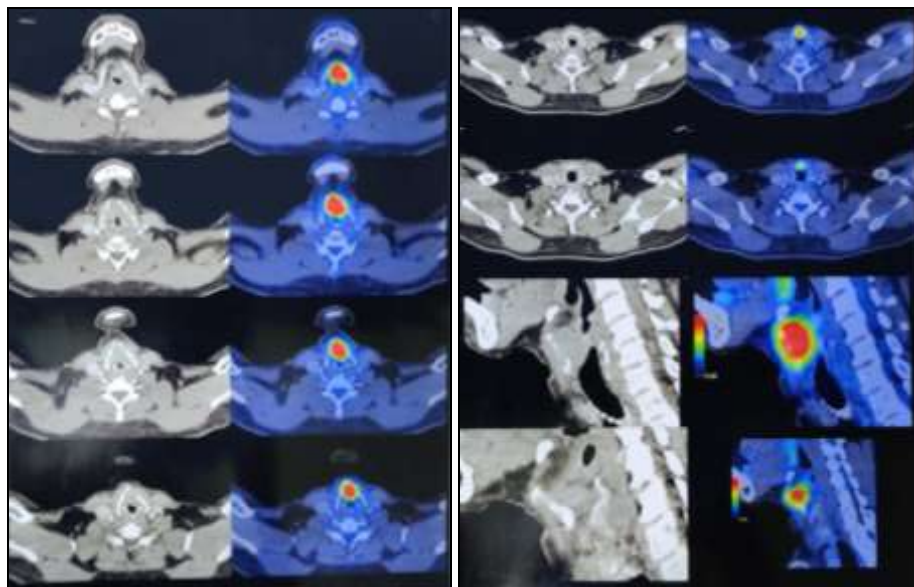
PETCT scan revealed primary left glottic tumour with extension across midline to right side and supraglottic extension.

Consent was taken for the radical surgery by conveying the prognostic aspects and possible complications associated with total laryngectomy and thyroidectomy to the patient and his relatives.

Sedative premedications were not given to patients in view of possible respiratory depression and obstruction.

Corresponding Author:

Dr. Reshma P
Postgraduate, Department of
Anaesthesiology, Saveetha
Medical College and Hospital,
Saveetha Nagar, Thandalam,
Chennai, Tamil Nadu, India

**Fig 1: PETCT****Technique**

Pre-operative fasting was observed for 8 hours. In the operating room, he was connected to ASA standard monitors. Wide bore iv line secured. All anaesthetic equipments and drugs were checked. Difficult airway equipments and fibre optic bronchoscope were kept ready. Premedication with inj.glycopyrrolate 0.2 mg iv. Preoxygenation with 100% oxygen was done for 3 min and induction was done with inj.fentanyl 100 mcg and inj.propofol 100mg. After ascertaining bag-mask ventilation, inj.vecuronium 6mg was given.

Using marshall video laryngoscope, with good visualization of epiglottis and vocal cords (Cormack II), patient was intubated with 7 size ETT. Anaesthesia was maintained with O₂ and N₂O (50%:50%), isoflurane and intermittent muscle relaxant doses.

**Fig 2: Video Laryngoscope****Ryle's tube was inserted**

After dissection of the larynx, the patient was maintained with 100% O₂, trachea-esophageal prosthesis (TEP) was attempted to place and the anaesthetist was asked to withdraw oral ETT. Patient desaturated from 100% to 88% SpO₂. Procedure was requested to stop and Intermittent oxygen was provided. Procedure was restored after ensuring 100% SpO₂. Following placement of TEP, tracheostomy was made at level of 3rd tracheal cartilage through separate incision and 7.5mm portex tracheostomy tube was inserted and oral ETT was withdrawn simultaneously.

**Fig 3: TEP Placement****Fig 4: Tracheostomy**

Surgical intervention included total laryngectomy with bilateral node dissection (level II – IV) with TEP placement. Intra operatively, adequate analgesia (inj.morphine 4mg), adequate iv fluids was given & urine output was adequate. No major blood loss.

At the end of the surgery, patient was on spontaneous ventilation.

After thorough oral and tracheostomy tube suctioning and adequate reversal with 5ml of Inj. Myopyrolate, patient extubated. The patient remained stable in post-anaesthetic care unit and later shifted to ward. Post operatively, patient was advised tracheostomy care. On POD 2, tracheostomy tube was removed and allowed to breathe directly, this was advantage of TEP prosthesis.

Discussion

Laryngeal carcinomas are common cancer of neck region which are known for their notoriety in spreading to adjacent structures and compromising breathing and deglutition functions. Common presenting symptoms include hoarseness, dysphagia, odynophagia, cough, pain due to cartilage invasion, and neck mass.

Airway assessment helps in determining the choice of anaesthetic and airway management techniques. It incorporates history and bedside examination, review of imaging and nasoendoscopy findings as well as discussion with the surgical team.

The choice of technique will depend on patient's clinical condition, availability of equipment, location, size, mobility and vascularity of the tumor [2].

In this patient, posterior commissure was free of tumour, minimal space for intubation was present. If the tumour had been big, then there would have been need for fiberoptic bronchoscope. Bougie directed intubation shouldn't be attempted, since blind intubation can lead to injury, which in turn leads to bleeding. Hence always intubation to be done under direct vision either with help of Video-laryngoscope or FOB guided.

The patient is usually positioned in 15-20° reverse Trendelenburg position to minimize venous congestion and aid surgical access. The eyes must be padded and peripheral nerves to be protected from compression injuries during these long procedures [3].

Laryngeal surgery, particularly when combined with radical neck dissection, can take many hours and the use of a humidifier, warmed intravenous fluids, and a forced air warming system together with temperature monitoring are recommended [4].

Currently, there are four main methods of voice rehabilitation for laryngectomized patients: Esophageal voice, electrolarynx, pneumatic artificial larynx, and tracheoesophageal shunt prosthesis. This case presented early hence it was easy to place TEP. TEP placement would have been difficult in case of late presentation. TEP is the newest laryngeal communication option, which approximates near normal laryngeal voice in laryngectomies.

Analgesic requirements can be met with IV morphine PCA system, supplemented with paracetamol and NSAID.

Careful management of tracheostomy is necessary in the immediate postoperative period with humidified oxygen to minimize crusting, and frequent suction to keep the airway clear of blood and secretions.

Patients experience many physical, social, and psychological problems.

Rehabilitation today focuses not only on optimal voice rehabilitation but also on adequate pulmonary and olfactory rehabilitation.

Anaesthetic Pearls

Difficulty in establishing airway in initial setting d/t tumor or airway distortion.

Sharing airway with surgeon.

Switch over from oral ETT to Montandon tube/ flexometallic tube/ tracheostomy tube.

Excessive bleeding due to adherent major vessels.

Air embolism due to major vessel opening in the middle of the surgery.

Subcutaneous false passage and subcutaneous emphysema.

Conclusion

Most of the laryngeal cancer patients present in 6th – 8th decade of life and there is preponderance of male smokers. Patients presenting for laryngeal cancer surgery present particular challenges for the anaesthetist. Thorough preoperative assessment & availability of specialized equipment to be ensured. As no single technique is 100% effective, primary plan for airway management and back-up plans need to be discussed and agreed between anaesthetic and surgical teams. New surgical techniques and voice prostheses has created positive impact on the quality of life for patients undergoing total laryngectomy.

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