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Suprahyoid pharyngotomy for tongue base tumors reincarnated

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Abstract

The surgical approach to the base of tongue and posterior wall of oropharynx and hypopharynx is controversial. Here we present our experience with ten such patients operated through suprahyoid pharyngotomy approach with the aim to study advantages and disadvantages of this approach along with review of literature. Ten patients with benign tumor and T1, T2 carcinoma of tongue base underwent surgical excision via suprahyoid pharyngotomy approach. Fifty percent of these tumors were histologically proven to be myoepithelioma followed by schwannoma. Dysphagia was the most worrisome problem post-operatively. Suprahyoid pharyngotomy is an old and time-tested approach. It provides an excellent and easier approach for benign tumor & early (T1, T2) cancer of the base of tongue for carefully selected patients.

Keywords: Suprahyoid pharyngotomy, pharyngotomy, tongue base tumors, surgical approaches to oropharynx

1. Introduction

The surgical approach to the base of tongue and posterior wall of oropharynx and hypopharynx is controversial. Carefully selected benign and malignant tumors arising in these anatomic sites may be surgically resected and reconstructed through a suprahyoid pharyngotomy approach with excellent opportunity for tumor clearance, very little morbidity and very good cure rates. Although in the era of laser assisted surgery and transoral robotic surgery for base of tongue tumors, we found this approach surgically easier to perform with very less post-operative complications and favourable outcomes, specially in smaller institutions devoid of such advanced technology.

2. Materials and methods

The study was carried out in the Department of Otolaryngology and Head Neck Surgery in a tertiary level healthcare centre comprising ten patients with base of tongue tumors successfully managed surgically over a period of four years from October, 2010 to August, 2014. Institutional ethics committee clearance and informed consent from all patients were obtained. All the patients, those were included in this study, were radiologically and pathologically proven benign and early (T1, T2) cancers limited to the tongue base. Any patient with tumors involving the anterior two-third of tongue, vallecula with lingual surface of epiglottis, lateral pharyngeal wall and tonsil, and those patients who were unable to tolerate general anaesthesia due to poor cardiopulmonary reserve were excluded from this study. Pre-operatively every patient underwent clinical evaluation which included examination of the primary by flexible fiberoptic laryngoscopy and manual palpation, clinical examination of neck, and both contrast enhanced computed tomography (CT) and magnetic resonance imaging (MRI) from base of skull to thorax. All the patients underwent elective tracheostomy for airway management during intra-operative and immediate post-operative period which were routinely removed on the seventh post-operative day, except in one patient with T2 squamous cell carcinoma (SCC) who was decannulated after 14 days [Figure-1].

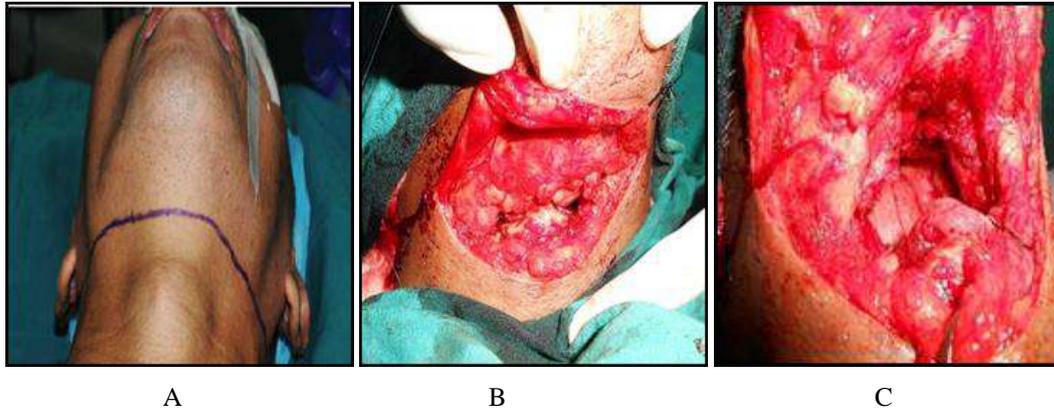


Fig 1: Operative technique. A: Incision marking, B: Exposing hyoid bone, C: Pharyngeal entry through suprahyoid pharyngotomy.

Excellent control over surgical margins and adequate surgical exposure were achieved in all cases. Primary closure of the defect were possible in all patients except one case of T2 SCC, where the defect was left to heal by secondary intention. All the patients were allowed to start on oral liquids after check gastrograffin swallow on 14th post-operative day. Evaluation of the merits and demerits of suprahyoid pharyngotomy as an approach to the base of tongue was then done based on complete tumor control, adequate exposure, preservation of physiology, minimization of cosmetic deformity, post-operative complications and simplicity of the technique. Post-operatively, all the patients were followed up every month during first six months using flexible fiberoptic laryngoscopy and clinical neck examination. Three cases of malignancy were, thereafter, followed up every three months till first 24 months, and every six months thereafter following the same protocol. Whole body positron emission tomography (PET) was performed in both cases of SCC three months after completion of adjuvant radiation, and then every six months. Data was analysed using SPSS Version 20, which were mainly descriptive in nature.

3. Results

The most common age group of presentation, in our study, was 50-60 years (4 patients; 40%) [Table-1], with malignant cases presenting in comparatively more advanced age than benign ones. Male preponderance was seen with 6 patients (60%).

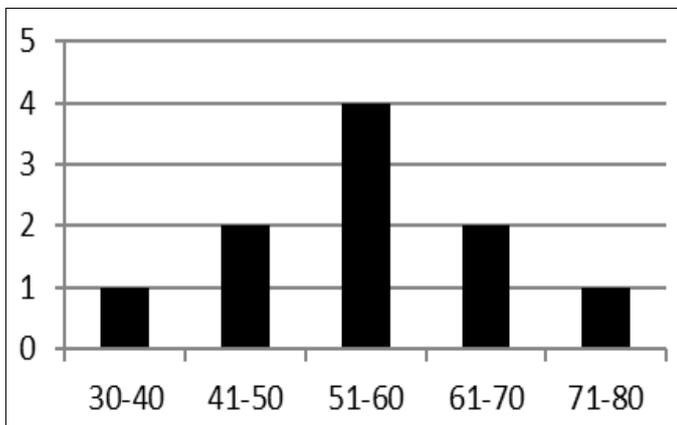


Table 1: Age distribution in the series.

The commonest presentation was dysphagia (8 patients; 80%), followed by odynophagia (2 patients; 20%). 2 patients with SCC (20%) also gave history of haemoptysis during the course of their illness [Table-2].

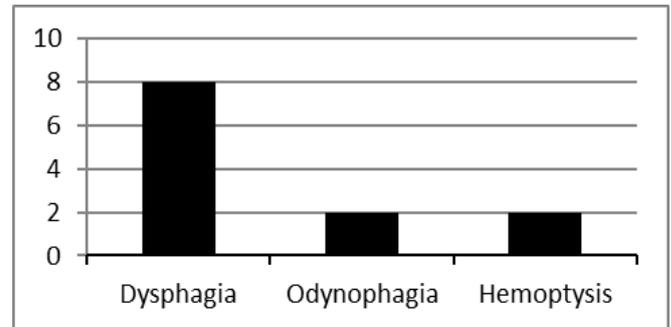


Table 2: Presenting features in the study.

Among various histological entities that we came across in our study, myoepithelioma was the commonest (4 patients; 40%), followed by schwannoma (3 patients; 30%), squamous cell carcinoma (2 patients; 20%) and low grade mucoepidermoid carcinoma (1 patient; 10%; abbreviated in Table-3 as MEC) [Table-3]. Negative tumor margins were achieved in all cases. Two patients with SCC also underwent bilateral modified radical neck dissection through the same apron flap that was raised intra-operatively. Both of them showed extra-capsular spread and received adjuvant chemoradiation.

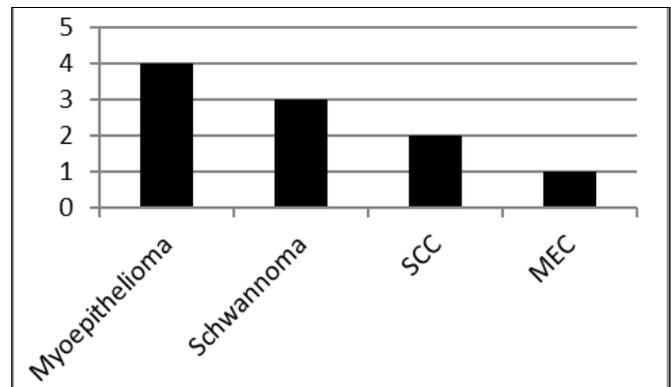


Table 3: Histopathological variants.

In the post-operative period, dysphagia was the most common complication noted (7 patients, 70%; four patients with benign tumor and three with carcinoma). Bleeding was encountered in two patients only (20%) which were managed conservatively [Table-4]. No instance of neurovascular injury, pharyngocutaneous fistula or aspiration was noted in any of the patients. All the patients could be started on oral liquid diet 14th post-operative day onwards. All of them were satisfied with nature of the scar in their neck.

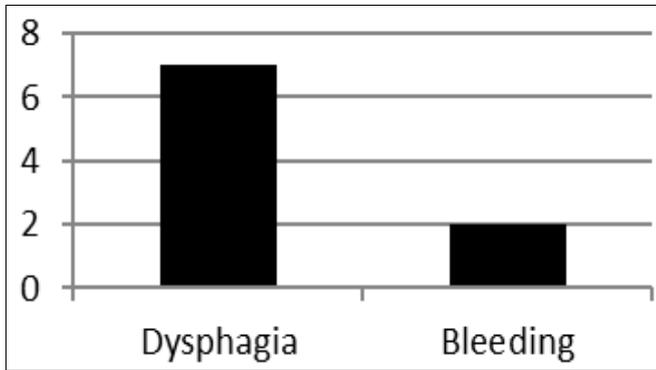


Table 4: Post-operative complications.

With a median follow up of four months for benign cases, no patient complained of dysphagia and speech abnormality. One case of T2 SCC died due to distant metastases in lungs and bones in 2nd post-operative year. Rest two cases of malignancy (SCC=1, MEC=1) are alive without any clinical evidence of disease till last follow up in their 4th post-operative year. No tracheostomy or feeding tube dependence was noted in the series. Both of them were able to eat and speak normally.

4. Discussion

Tongue base tumors impose a surgical dilemma on a surgeon's mind regarding the approach of the surgery. Now-a-days, small benign and early (T1, T2) malignant tumors are addressed with transoral laser or robotic surgery ^[1, 2, 3, 4] in institutions having those advanced technological support.

Jeremitsch first described suprahyoid pharyngotomy approach for oropharynx in 1895 ^[5]. His decision was based on observation of a patient who had attempted suicide by slashing his neck. During the attempt, a laceration was produced that approximated a suprahyoid pharyngotomy. He noted that bleeding was minimal, no nerves were severed, the airway was good and the wound healed favourably. Hoffmann also reported good success with this approach in 1907 ^[6]. Barbosa, of Brazil, in 1974, included the classic description of the technique of suprahyoid pharyngotomy in his textbook ^[7].

Suprahyoid pharyngotomy is an excellent approach when combined with neck dissection for the treatment of early malignant lesions of the tongue base. It may be also applied without neck dissection in patients with benign or low-grade salivary gland malignancies. Tumors of tongue base excised by this approach should ideally be located posterior to the circumvallate papillae. Involvement of lateral pharyngeal wall or tonsil may require lateral pharyngotomy for adequate exposure. Lateral pharyngotomy is another cervical approach for oropharynx. But, need of retraction of superior laryngeal nerve and vessels, hypoglossal nerve and lingual artery, and dissection of pharyngeal constrictors to gain entry into oropharynx is always associated with a higher risk of inadvertent injury to these structures. Moreover, neck dissection of Level-IIA lies just above the pharyngotomy scar, making it more prone for fistula formation. On the contrary, midline of the neck is a relatively featureless area with more soft tissue bulk due to thick tongue base musculature, which allows even a novice surgeon to approach tongue base more easily with lesser risk of post-operative fistula formation. Preservation of hyoid allows a better closure, but hyoid may be excised depending on the tumor extension. This procedure should also not be used for tumors of the vallecula involving the lingual surface of the epiglottis as the entry to oropharynx is through vallecula only.

Correct pre-operative staging is essential to determine whether suprahyoid pharyngotomy is the best surgical approach for the tongue base tumor. Magnetic resonance imaging (MRI) has proved to be the most sensitive modality for evaluating tumors of the base of tongue because of the excellent soft tissue definition that it provides. Gross invasion of the pre-epiglottic space and the depth of infiltration into the tongue base may be determined by obtaining sagittal MRI cuts of the tongue base-larynx complex. The high signal intensity of pre-epiglottic fat can usually be distinguished from the dense fibres of hyoepiglottic ligament, tongue base musculature, lingual lymphoid tissue and cancer ^[8].

Weber *et al* described in a case series of 13 patients where suprahyoid pharyngotomy was used in all cases with T1, T2 SCC of the base of the tongue. Patients with lymph node metastases underwent radical neck dissection, and many patients received adjuvant radiation. Patients in whom extracapsular spread was demonstrated received adjuvant chemotherapy in addition to radiation. All the patients were decannulated before discharge within 3 weeks after surgery. All patients were able to take regular diet 2 months post-operatively. Long term follow up revealed stable weight after an initial weight loss. No patient required a completion laryngectomy for chronic aspiration. Speech was found to be well understood in all of the patients. All these patients have a minimum 2-year follow up with no evidence of local recurrence ^[9]. Another paper by Zeitels *et al* showed strikingly similar results when this technique was used primarily for limited lesions of the tongue base ^[8]. Post-operative follow up for 3 cases of malignancy in this series was done according to the National Comprehensive Cancer Network (NCCN) guidelines version 1.2015 for head and neck cancers. No incidence of local recurrence is noted yet in the present study. One patient died due to development of distant metastases to lungs and bones 2 years after surgery.

Regarding complications, Weber *et al* found in their case series, small pharyngocutaneous fistula in 3 of their patients, all of which healed within 10 days with conservative management. Pneumonia was found in one patient due to aspiration, which also resolved with antibiotics ^[9]. In the present series, no neurovascular injury, pharyngocutaneous fistula or aspiration was found in any of the patients post-operatively. The most common worrisome symptom was dysphagia, found in 7 patients (70%) post-operatively which resolved over a period of time varying from 20 days to 3 months. Bleeding was encountered in 2 patients (20%) only, and was managed conservatively. None of the patients was found to be dependent on tracheostomy or feeding tube for a prolonged period.

5. Conclusion

Although suprahyoid pharyngotomy is an age old surgical approach in the modern era of minimally invasive surgery and largely superseded by transoral laser or robotic surgery in advanced centres, we found this approach to be extremely useful, particularly in institutions devoid of laser and robotic surgery facilities. Surgeons who are not trained with these modalities, can address the tumors of the base of tongue through suprahyoid pharyngotomy as it is surgically less demanding, easier to perform and with favourable post-operative outcome. Meticulous pre-operative evaluation and planning are the keystones to success when used for surgical excision of benign & early (T1, T2) cancer of the base of tongue.

6. Acknowledgement

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7. Conflicts of interest

The authors declare no conflict of interest.

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