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Case Report

Oral Squamous Cell Carcinoma of the Tongue in a Long-Term Mishri User: Diagnosis, Management, and Follow-Up — A Case Report

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Abstract

Oral squamous cell carcinoma (OSCC) of is one of the common and aggressive malignancy, often associated with tobacco use. Early recognition and a multidisciplinary treatment approach are essential for improving outcomes. In this case report a 57-year-old female with a 15-year history of mishri (smokeless tobacco) use presented with a progressively enlarging ulcer on the right lateral border of the tongue. Initially painless, the lesion gradually became painful and interfered with oral function. Clinical examination revealed an indurated ulcer with rolled margins and a fixed right submandibular lymph node. MRI demonstrated a hyperintense lesion on T2- and STIR-weighted images, and biopsy confirmed moderately differentiated oral squamous cell carcinoma. PET/CT scan showed a metabolically active primary lesion. The patient underwent wide local excision of the tongue segment with bilateral functional neck dissection, followed by adjuvant radiotherapy. A PET/CT scan at 7 months showed no residual disease. During follow-up, she developed grade 2 dermatitis, mucositis, and dysphagia as acute side effects, and later experienced xerostomia, radiation caries, and superimposed candidal infection, which were managed with appropriate treatment. This case underscores the importance of multimodal imaging, surgical intervention, and adjuvant therapy in the management of tongue carcinoma, along with long-term supportive care to address radiation-related complications.

Keywords: Oral Squamous Cell Carcinoma; Tongue Carcinoma; Smokeless Tobacco; Functional Neck Dissection; Oral Cancer Management

Introduction

Oral squamous cell carcinoma (OSCC) accounts for over 90% of all oral malignancies [1]. It remains a significant health burden worldwide, particularly in regions with high tobacco use prevalence. Among its various subtypes, carcinoma of the tongue is clinically aggressive due to its early propensity for local invasion and lymphatic spread [2].

Risk factors including tobacco and alcohol use. Chronic trauma, Genetic predisposition, Nutritional deficiency, Poor oral hygiene, Human papilloma virus infection are the other important causative factors [3].

Although early-stage oral cavity cancer generally has a favorable prognosis, most patients continue to present with advanced-stage disease, which is linked to significantly worse outcomes [4]. Multimodal management—including surgical resection with lymphadenectomy followed by radiotherapy—offers the best chance for long-term survival in cases with nodal involvement [5]. This report presents a clinically illustrative case of moderately differentiated OSCC of the tongue with nodal metastasis, successfully treated through a multidisciplinary approach.

Case Report

A 57-year-old female with a 15-year history of mishri (a smokeless tobacco preparation) use presented with a progressively enlarging ulcer on the right lateral border of her tongue. Initially painless and small, the lesion gradually increased in size and became painful over time, prompting clinical evaluation.

On extraoral examination, a firm, non-tender, fixed right submandibular lymph node was noted. Intraorally, a solitary, indurated ulcer with rolled margins was evident on the right lateral tongue. Based on clinical findings, a provisional diagnosis of oral squamous cell carcinoma (OSCC) was considered.

Toluidine blue staining showed no significant dye uptake, yet the clinical suspicion for malignancy remained high.

Magnetic resonance imaging (MRI) revealed a hyperintense lesion on T2- and STIR-weighted images, appearing hypointense on T1-weighted images. The lesion infiltrated the genioglossus and hyoglossus muscles and extended toward the lingual septum and inferior alveolus.

Histopathological examination confirmed a diagnosis of moderately differentiated squamous cell carcinoma.

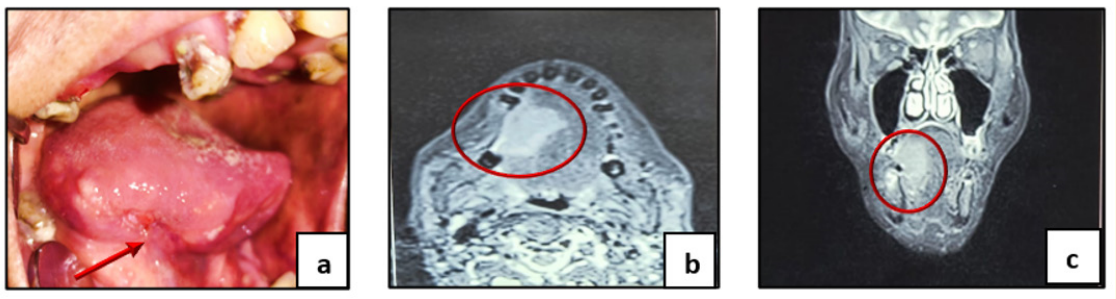

Figure 1: (a). Solitary ulcerative lesion on the right lateral aspect of tongue (red arrow). (b and c). Hyperdense area on the MRI infiltrating the genioglossus, hyoglossus and mylohyoid muscles encroaching in to the midline raphe (red encircled area).

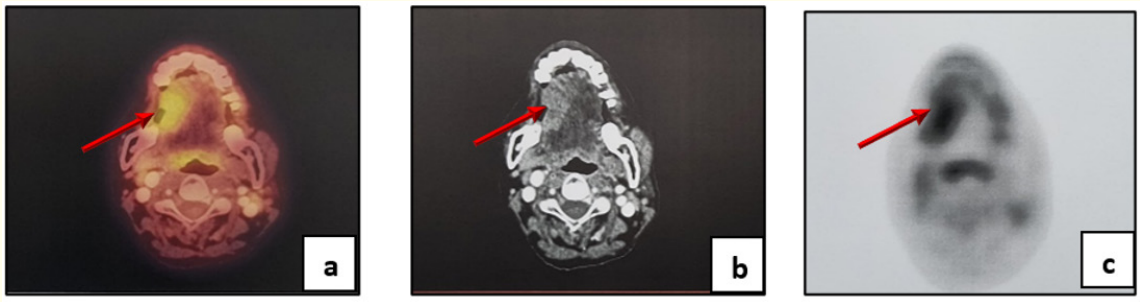

Figure 2a, 2b and 2c : PET/CT scan demonstrated a metabolically active primary lesion involving the anterior right lateral tongue with midline extension (red arrow) along with metabolically active, mildly enlarged cervical lymph nodes.

A whole-body PET/CT scan demonstrated a metabolically active primary lesion involving the anterior right lateral tongue with midline extension, but sparing the floor of the mouth. Metabolically active, mildly enlarged cervical lymph nodes at right level IB and level II were also identified, indicating regional lymphatic metastasis.

Following multidisciplinary tumor board discussions, a two-phase treatment plan was adopted. Phase I involved up front wide local excision of the affected tongue segment along with bilateral cervical lymph node dissection (level I to V) with functional neck dissection.

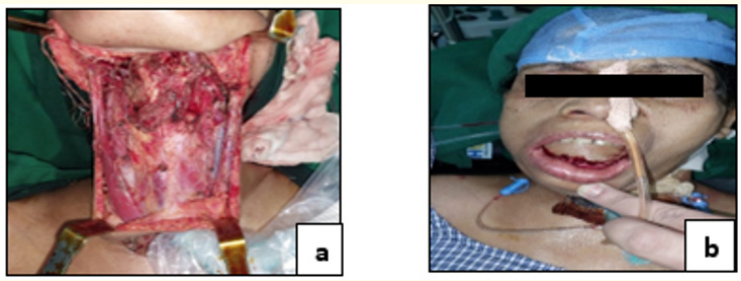

Figure 3a: (a) Intraoperative Photograph (b) Post operative photograph.

Phase II consisted adjuvant radiotherapy and prior to this comprehensive dental evaluation and management were carried out, which included extraction of teeth with poor prognosis or extensive caries, oral prophylaxis, scaling, fluoride application, and necessary restorations.

Radiotherapy given in 30 fractions over 6 weeks period using helical three-dimensional conformal radiotherapy (3DCRT) on tomotherapy to post -operative tumor bed and draining lymph nodes. 60 Gy in 30 fractions to tumor bed and bilateral level level I, II and right level III - IVA, and 54 Gy in 30 fractions to left level 3-4 were given along with concurrent weekly chemotherapy using cisplatin.

In the PET-CT scan taken after 7 months later the previously seen tongue mass is no longer appreciated. The mild focal area of increased metabolic activity noted along the remnant tongue extending in to the left side appears to be physiologic uptake and no active disease elsewhere.

The whole treatment completed without undue gap. Patient developed grade 2 dermatitis, mucositis and dysphagia as the side effects. Patient advised for follow – up once in three months for initial 2 years, then 6 monthly for next 5 years.

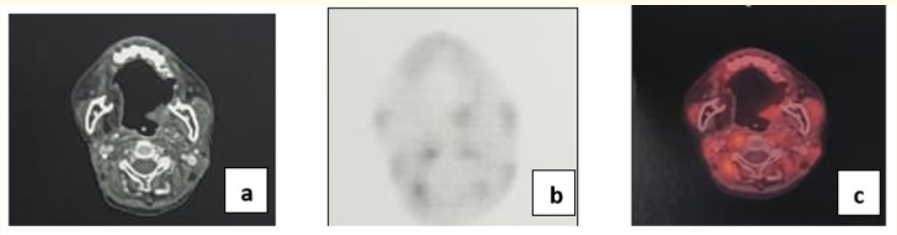

Figure 4: (a), (b) and (c): PET-CT scan taken after 7 months showing mild focal area of increased metabolic activity noted along the remnant tongue extending in to the left side appears to be physiologic uptake.

At her most recent follow-up—approximately 16 months post-treatment initiation—she remained disease-free with no signs of recurrence, erythematous area noted on the entire oral cavity with burning sensation suggestive of superimposed candidal infection along with xerostomia and radiation caries.

Topical antifungal medication and salivary substitutes were prescribed for the patient. As the affected teeth were deemed non-restorable, extraction was planned subsequently.

Figure 5: Follow-up—approximately 16 months post-treatment initiation showing (a)radiation caries (b) superimposed candidal infection (c) radiation dermatitis.

This case highlights the insidious nature of oral cancer in users of smokeless tobacco and emphasizes the importance of proper diagnosis. Use of imaging modalities like MRI, PECT/CT played a crucial role here in identifying the extend of spread of lesion, involvement of various anatomic structures, lymph node involvement etc in this case. A multidisciplinary approach combining surgical intervention and adjuvant radiotherapy contributed to the patient's favourable outcome. Early recognition, comprehensive assessment, and coordinated care remain cornerstones in improving survival and minimizing recurrence in OSCC patients.

Discussion

Oral cancer remains a major global health concern, ranking sixth among all cancers, with India contributing nearly one-third of the worldwide burden. In the Indian context, approximately 70% of cases are diagnosed at advanced stages (American Joint Committee on Cancer, Stage III–IV), resulting in poor prognosis and five-year survival rates of around 20% [6].

Both genetic and epigenetic factors contribute to the development of oral and head and neck squamous cell carcinoma (HN-

SCC), with established risk factors including tobacco use, alcohol consumption, dietary and nutritional deficiencies, viral infections, radiation exposure, ethnicity, genetic predisposition, oral candidiasis, immunosuppression, habitual mouthwash use, syphilis, dental trauma, and occupational hazards [7].

Tobacco smoking and alcohol are considered the predominant causes of squamous cell carcinoma of the oral cavity (SCCOC), while in Asian populations, cultural habits such as betel nut chewing and smokeless tobacco use are strongly implicated [8]. The present case closely reflects this epidemiological pattern, involving a 57-year-old female with a 15-year history of mishri (smokeless tobacco) use who presented with an advanced lesion on the lateral border of the tongue. As the clinical suspicion remained high, and further evaluation with advanced imaging and biopsy confirmed the diagnosis.

Various imaging modalities ranging from orthopantomogram, computed tomography (CT), magnetic resonance imaging (MRI), single photon emission computed tomography (SPECT), positron emission tomography (PET), and positron emission tomography–computed tomography (PET/CT) are used in the diagnosis, staging, and treatment planning of oral cancer, with MRI and PET/CT being particularly valuable in assessing tumor extent and metastatic spread. In this case, MRI revealed infiltration into the genioglossus and hyoglossus muscles, while PET/CT demonstrated metabolic activity in the primary lesion and regional lymph nodes. This aligns with established diagnostic protocols, which also include vital staining, optical imaging devices (e.g., VELscope, chemiluminescence, ViziLite), histopathology, biomarker analysis, and emerging artificial intelligence–based systems [9].

The treatment of oral cancer depends on the stage at diagnosis, with early lesions typically managed surgically, whereas advanced cases may require multimodal approaches including surgery, radiotherapy, chemotherapy, or, in selected cases, immunotherapy. In this patient, a multidisciplinary treatment plan consisting of wide local excision with bilateral neck dissection followed by adjuvant radiotherapy achieved a favorable short-term outcome, with the patient remaining disease-free at 16 months. This case underscores the importance of comprehensive assessment, integration of advanced imaging, and coordinated multidisciplinary care in improving survival outcomes in oral squamous cell carcinoma, even in advanced presentations.

Conclusion

This case highlights the insidious nature of oral cancer in users of smokeless tobacco and emphasizes the importance of early lesion detection. Imaging and histopathology were instrumental in accurate diagnosis and staging. A multidisciplinary approach combining surgical intervention and adjuvant radiotherapy contributed to the patient's favorable outcome. Early recognition, comprehensive assessment, and coordinated care remain cornerstones in improving survival and minimizing recurrence in OSCC patients. Cross-sectional imaging and histopathology play indispensable roles in staging and management planning. Timely intervention and follow-up remain key to improving survival and reducing recurrence rates in OSCC [10].

Ethical Permission

The patient has given informed consent for the publication of this report and the use of images.

Conflict of Interest

The authors have no relevant financial or non-financial interests to disclose.

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All authors contributed to the manuscript and read and approved the final version of the manuscript. The authors declare no conflicts of interest related to this case report. No external funding was provided for this work. Informed consent was obtained from the patient for the publication of clinical details and images. No external support - technical, financial, or material was obtained for this case report.

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