



SQUAMOUS CELL CARCINOMA OF BUCCAL MUCOSA WITH MASTICATOR SPACE AND MAXILLARY SINUS INVOLVEMENT: A CASE REPORT

Dentistry

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ABSTRACT

Oral squamous cell carcinoma (OSCC) is the most common malignancy of the oral cavity and frequently presents at an advanced stage among chronic smokeless tobacco users. We report a 57-year-old male with an ulceroproliferative lesion involving the right buccal mucosa associated with facial swelling and severe trismus. Clinical examination revealed an indurated lesion with ipsilateral cervical lymphadenopathy. Orthopantomography demonstrated poor periodontal status, while contrast-enhanced computed tomography showed tumour extension into the right masticator space and maxillary sinus. FDG PET-CT confirmed locally advanced disease with ipsilateral cervical lymph node metastasis and no distant metastasis. Histopathological examination established the diagnosis of moderately differentiated keratinizing squamous cell carcinoma. The patient was referred for multidisciplinary management. This case highlights the importance of early diagnosis, histopathological confirmation, and multimodality imaging for accurate staging and treatment planning in advanced buccal mucosal squamous cell carcinoma.

KEYWORDS

Oral Squamous Cell Carcinoma; Buccal Mucosa; Computed Tomography; FDG PET-CT

INTRODUCTION

Oral squamous cell carcinoma (OSCC) is the most common malignancy of the oral cavity, accounting for approximately 90–95% of all oral cancers worldwide.[1,2] It remains a significant public health problem, particularly in developing countries such as India, where the widespread use of smokeless tobacco, areca nut, betel quid, and smoking contributes substantially to disease incidence.[3–5] The buccal mucosa is one of the most commonly affected sites because smokeless tobacco is frequently retained in the buccal vestibule, resulting in prolonged exposure of the oral mucosa to carcinogens.

Clinically, buccal mucosal squamous cell carcinoma typically presents as a persistent non-healing ulcer, ulceroproliferative growth, pain, facial swelling, trismus, and cervical lymphadenopathy. Delayed diagnosis often results in invasion of adjacent structures, including the masticator space and maxillary sinus, leading to advanced disease and poorer prognosis.[6–9]

Accurate assessment of tumour extent requires a combination of clinical examination, histopathological confirmation, and multimodality imaging. Orthopantomography provides an overview of dentoalveolar structures, while contrast-enhanced computed tomography (CECT) and fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT) are essential for evaluating local tumour spread, regional lymph node involvement, and disease staging.[10–12]

We report a case of **moderately differentiated buccal mucosal squamous cell carcinoma** with extension into the **masticator space and maxillary sinus**, highlighting the role of multimodality imaging in accurate staging and multidisciplinary treatment planning.

CASE REPORT

A 57-year-old male presented to the Department of Oral Medicine and Radiology with a chief complaint of a painful ulcer over the right posterior buccal mucosa for three months. The lesion initially appeared as a small ulcer and progressively increased in size, becoming associated with pain, swelling over the right side of the face, difficulty in mastication, and progressive restriction of mouth opening. Prior to presentation at our institution, the patient had consulted a local dental practitioner, where routine hematological investigations, orthopantomography (OPG), contrast-enhanced computed tomography (CECT), and an incisional biopsy were performed. Histopathological examination confirmed squamous cell carcinoma, following which fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET-CT) was performed for disease

staging before referral for further management.

The patient's medical and surgical histories were non-contributory. He had a 15-year history of consuming Hans®, a commercially available smokeless tobacco product, approximately three packets daily, with habitual retention of the quid in the right buccal vestibule for about 20 minutes before expectoration. No significant family history of malignancy was reported.

General physical examination revealed a moderately built and moderately nourished individual with stable vital signs. Extraoral examination demonstrated a diffuse swelling measuring approximately 5 × 5 cm over the lower third of the right side of the face. Two enlarged right submandibular lymph nodes measuring approximately 1.5 × 1.5 cm were palpable; both were firm, tender, and fixed to the underlying tissues. Maximum interincisal mouth opening was restricted to 12 mm, suggestive of severe trismus.

Intraoral examination revealed poor oral hygiene with generalized chronic periodontitis, multiple missing teeth, retained root stumps, and dental caries. A solitary ulceroproliferative lesion measuring approximately 5 × 4 cm was present on the right buccal mucosa, extending from the oral commissure posteriorly to the retromolar trigone and vertically from the maxillary to the mandibular buccal vestibule. The lesion exhibited irregular indurated margins with an erythematous surface covered by yellowish-white necrotic slough. On palpation, it was firm, tender, indurated, and fixed to the underlying tissues without spontaneous bleeding, raising a strong clinical suspicion of oral squamous cell carcinoma.



Figure 1. Intraoral clinical photograph showing the ulceroproliferative lesion involving the right buccal mucosa.

Based on the clinical findings, a provisional diagnosis of oral squamous cell carcinoma was made. Differential diagnoses included verrucous carcinoma, chronic traumatic ulcer, deep fungal infection, tuberculous ulcer, and necrotizing sialometaplasia.

Orthopantomography demonstrated generalized horizontal alveolar bone loss, multiple retained root stumps, and deep proximal carious lesions without obvious mandibular cortical destruction.



Figure 2. Orthopantomogram demonstrating generalized periodontal destruction and retained root stumps.

Contrast-enhanced computed tomography revealed a heterogeneously enhancing infiltrative lesion involving the right buccal mucosa with extension into the right masticator space and right maxillary sinus, confirming locally advanced disease.



Figure 3. Contrast-enhanced computed tomography demonstrating tumour extension into the right masticator space and right maxillary sinus.

FDG PET-CT demonstrated an intensely FDG-avid lesion involving the right buccal mucosa with extension into the retromolar trigone, masticator space, parapharyngeal space, infratemporal fossa, and right maxillary sinus, along with metabolically active right Level IB and Level II cervical lymph nodes. No evidence of distant metastasis was detected, and the tumour was clinically staged as cT3N2bM0 (AJCC 8th Edition).

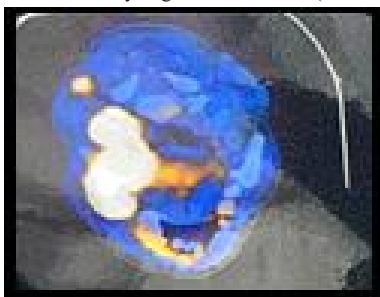


Figure 4. FDG PET-CT demonstrating the metabolically active primary tumour with ipsilateral cervical lymph node metastasis.

Histopathological examination of the incisional biopsy revealed infiltrating nests and islands of malignant squamous epithelial cells with keratin pearl formation, confirming moderately differentiated keratinizing squamous cell carcinoma. Based on the clinical, radiological, and histopathological findings, the final diagnosis was moderately differentiated keratinizing squamous cell carcinoma of the right buccal mucosa (cT3N2bM0). The patient was referred to the Department of Surgical Oncology, where a multidisciplinary tumour board recommended three cycles of neoadjuvant chemotherapy followed by definitive surgical resection and postoperative radiotherapy.

DISCUSSION

Oral squamous cell carcinoma (OSCC) accounts for approximately 90–95% of all oral malignancies and remains a major public health concern, particularly in developing countries such as India.[1,2] The high prevalence is largely attributed to the widespread use of smokeless tobacco, areca nut, betel quid, and smoking.[3–5] In the present case, the patient had a 15-year history of consuming Hans®, a commercially available smokeless tobacco product, with habitual retention in the right buccal vestibule. This chronic local exposure is a well-recognized risk factor for the development of buccal mucosal squamous cell carcinoma.[4,5]

Buccal mucosal squamous cell carcinoma commonly presents as a non-healing ulcer, ulceroproliferative growth, pain, trismus, and cervical lymphadenopathy.[6] The present patient exhibited these characteristic clinical features and sought treatment only after progressive enlargement of the lesion and worsening mouth opening, resulting in locally advanced disease. This highlights the importance of early recognition of suspicious oral lesions by dental practitioners to facilitate timely diagnosis and referral.

Imaging plays a crucial role in evaluating tumour extent and disease staging. Although orthopantomography provides useful information regarding dentoalveolar structures, its ability to assess soft tissue extension is limited.[7] In the present case, the orthopantomogram demonstrated generalized periodontal destruction and retained root stumps but failed to define the extent of tumour spread.

Contrast-enhanced computed tomography (CECT) accurately demonstrated infiltration of the right masticator space and maxillary sinus, findings that explained the patient's severe trismus and confirmed advanced local disease. CECT remains the imaging modality of choice for evaluating tumour extent, cortical bone involvement, and adjacent soft tissue invasion in oral malignancies.[8,9]

FDG PET-CT further demonstrated metabolically active disease involving the primary tumour and ipsilateral cervical lymph nodes without evidence of distant metastasis. The combined anatomical and functional information obtained from PET-CT improved tumour staging and facilitated multidisciplinary treatment planning, particularly in advanced-stage disease.[10]

Histopathological examination confirmed moderately differentiated keratinizing squamous cell carcinoma, establishing the definitive diagnosis. Based on the clinical, radiological, and histopathological findings, the tumour was staged as T3N2bM0, and the patient was advised neoadjuvant chemotherapy followed by definitive surgical resection and postoperative radiotherapy in accordance with current management protocols for locally advanced oral squamous cell carcinoma.[11,12]

The present case emphasizes the importance of comprehensive clinical examination, prompt histopathological confirmation, and multimodality imaging in accurately staging advanced buccal mucosal squamous cell carcinoma. Early diagnosis and timely multidisciplinary management remain essential for improving treatment outcomes and reducing disease-related morbidity.

CONCLUSION

This case highlights the aggressive nature of buccal mucosal squamous cell carcinoma and the importance of early diagnosis in preventing advanced local spread. Comprehensive clinical examination, histopathological confirmation, and multimodality imaging using CECT and FDG PET-CT were crucial for accurate staging and treatment planning. Early biopsy, prompt referral, and multidisciplinary management are essential for improving patient outcomes in advanced oral squamous cell carcinoma.

PATIENT CONSENT

Informed consent was obtained from the patient for publication of this case report. The patient was informed that all efforts would be made to preserve anonymity and confidentiality, although complete anonymity cannot be guaranteed.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

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