

Case Report

Squamous cell carcinoma of the right gingivobuccal sulcus: A case report

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Abstract

Chronic use of tobacco and areca nut is strongly associated with oral squamous cell carcinoma (OSCC), particularly affecting the gingivobuccal sulcus. Due to delayed clinical recognition, it frequently presents at advanced stages, necessitating aggressive multimodal treatment. This case report presents a 58-year-old male diagnosed with moderately differentiated squamous cell carcinoma (SCC) involving the right gingivobuccal sulcus, with perineural invasion and mandibular involvement. The patient underwent partial mandibulectomy, selective neck dissection, and adjuvant radiotherapy. This report highlights the importance of early detection, lifestyle modifications, and a multidisciplinary treatment approach for optimizing outcomes in OSCC.

Keywords: Gingivobuccal sulcus, Oral squamous cell carcinoma, Perineural invasion, Mandibular involvement, Tobacco-associated malignancy.

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1. Introduction

Oral squamous cell carcinoma (OSCC) is the most common type of oral cancer and poses a significant health concern, especially in South Asian countries. The high prevalence in this region is closely linked to habits such as chewing tobacco, betel nut (areca nut), and other smokeless tobacco products, along with poor oral hygiene and nutritional deficiencies. Among the various regions within the oral cavity, the gingivobuccal sulcus is particularly susceptible. This is partly because carcinogenic substances tend to collect in this area, resulting in prolonged exposure and increased risk of malignant transformation.¹

The development of OSCC is a gradual process, often beginning with chronic irritation of the mucosa, which may lead to changes like leukoplakia or erythroplakia. Without intervention, these potentially malignant disorders can progress to carcinoma. Tobacco products, especially in the form of gutkha or khaini, play a central role in this transformation by delivering a range of harmful chemicals directly to the mucosal lining.²

One of the challenges with OSCC is that the early stages are frequently painless and may be overlooked. Suspicious signs include persistent ulcers, mucosal thickening, limited mouth opening, and bleeding. Diagnosis typically requires a combination of clinical evaluation, biopsy, and imaging. Histopathological examination confirms the diagnosis, while imaging helps assess the extent of tissue involvement and aids in planning treatment.

Tumors in the gingivobuccal sulcus often invade nearby structures, including the mandible, and may follow nerve pathways, leading to perineural spread. These factors not only complicate treatment but also worsen the prognosis. Management involves a multi-disciplinary approach. Surgery remains the primary mode of treatment, especially when clear margins can be achieved. Depending on the tumor stage and pathological features such as nodal involvement or bone invasion, radiotherapy or chemo radiotherapy may be added postoperatively.³

Despite improvements in treatment strategies, outcomes in advanced stages remain suboptimal. Survival rates are significantly higher when the disease is identified early, reinforcing the importance of awareness, habit cessation, and

regular oral screenings. This case report presents a patient with gingivobuccal sulcus carcinoma associated with habitual gutkha chewing, emphasizing the role of early diagnosis and coordinated care in managing such cases effectively.⁴

1.1. Patient information

A 58-year-old male presented to the outpatient clinic with complaints of a non-healing ulcer on the right lower buccal mucosa, persisting for approximately two months. He described progressive pain, which was exacerbated during chewing, along with occasional bleeding from the lesion.

The patient had a longstanding history of gutkha use, consuming it 6–7 times daily over the past 30 years. He also reported intermittent cigarette smoking and occasional alcohol intake. His dietary history revealed low consumption of fruits, vegetables, and antioxidants.

2. Medical and Family History

The patient had comorbid conditions including type 2 diabetes mellitus, hypertension, and osteoarthritis, all of which were well-controlled on medications. There was no known family history of malignancy.

2.1. Clinical findings

On physical examination, a 3 cm × 2 cm ulcer was noted in the right gingivobuccal sulcus, characterized by irregular, indurated margins and erythematous mucosa with central areas of necrosis. The lesion bled slightly upon palpation. Surrounding tissues showed firmness and fixation, suggesting local invasion.

Although no clinically palpable cervical lymph nodes were evident, induration in adjacent tissues raised suspicion of subclinical nodal involvement. Mouth opening was mildly restricted, and the patient reported discomfort on wide opening.



Figure 1: Preoperative orthopantomogram (OPG) showing irregularity and erosion of the mandibular cortical bone in the right premolar-molar region.



Figure 2: Intraoperative image showing the primary lesion involving the right buccal mucosa and gingivobuccal sulcus prior to resection.

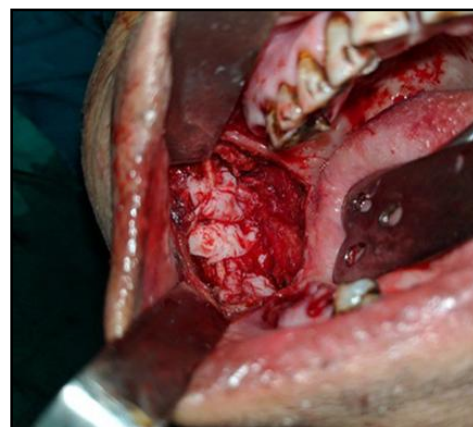


Figure 3: Intraoral view post-tumor excision, with placement of a collagen sheet and hemostatic dressing over the surgical defect.

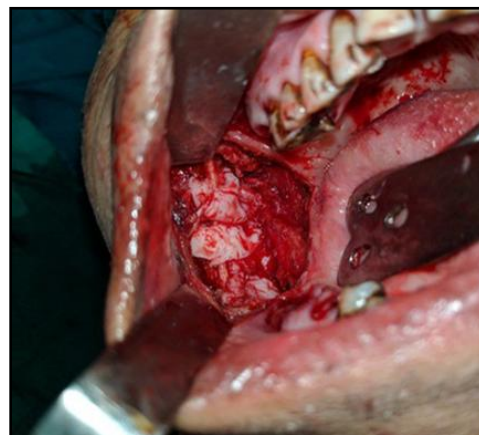


Figure 4: Excised buccal specimen with attached mucosa and underlying soft tissue involved by the tumor.



Figure 5: Intraoperative view of the neck following level I-III selective neck dissection, exposing vital anatomical structures.



Figure 6: Postoperative image showing final closure of both intraoral and neck wounds with satisfactory

3. Diagnostic Assessment

Baseline blood investigations, including complete blood count, renal function tests, and liver function tests, were within normal limits.(**Figure 1**)

A contrast-enhanced computed tomography (CT) scan of the face and neck demonstrated a soft tissue mass involving the right buccal mucosa and gingivobuccal sulcus, with erosion of the adjacent mandibular cortex and ipsilateral cervical lymphadenopathy at levels I and II (**Figure 2**).

An incisional biopsy was performed from the ulcer edge. Histopathological analysis confirmed the diagnosis of moderately differentiated squamous cell carcinoma (SCC) with perineural invasion.

Staging was determined as T2N1M0 (AJCC 8th edition), indicating a primary tumor of 2–4 cm in greatest dimension with single ipsilateral nodal involvement and no distant metastasis.

Although MRI was considered for further soft tissue and perineural involvement assessment, it was deemed unnecessary due to sufficient information provided by CT. PET-CT was not performed due to resource constraints, but it was acknowledged as a valuable tool for evaluating distant metastasis and treatment planning.

4. Therapeutic Intervention

The patient underwent wide local excision of the lesion with 1–2 cm oncologic margins, along with a partial segmental mandibulectomy due to bone involvement. A selective neck dissection of levels I–III was performed to address regional lymphatics. Intraoperatively, significant mandibular bone erosion was confirmed (**Figure 3, Figure 4**).

Although free flap reconstruction was initially planned, it was deferred based on intraoperative assessment, which showed a moderate-sized defect that was manageable without microvascular reconstruction, considering the patient's general condition and preference.

Given the presence of perineural invasion, the patient received postoperative adjuvant radiotherapy. Chemotherapy was not indicated, as surgical margins were clear and only a single lymph node was involved without extracapsular extension.

Postoperative care included glycemic control, soft diet with nutritional support, and analgesia. The patient was educated on oral hygiene and was counseled on complete tobacco cessation.

4.1. Follow-Up and outcomes

The postoperative course was uneventful. The patient tolerated radiotherapy well and reported gradual improvement in mouth opening and oral intake. At the most recent follow-up visit (3 months post-radiation), there were no clinical or radiological signs of recurrence. Functional recovery was acceptable, with intact speech, adequate swallowing, and mild trismus as the only residual complaint (**Figure 5, Figure 6**).

The patient is currently under regular follow-up, with scheduled quarterly clinical reviews and imaging assessments at 6 months and 12 months post-treatment.

5. Discussion

This case highlights the aggressive clinical behavior of squamous cell carcinoma (SCC) of the gingivobuccal sulcus, a subsite known for its high vulnerability due to direct and prolonged exposure to carcinogenic substances, particularly in regions with prevalent gutkha and areca nut consumption. Several epidemiological studies have established a strong association between smokeless tobacco use and oral cancers in South Asia, with the gingivobuccal sulcus being disproportionately affected due to chronic mucosal retention of carcinogens.⁵

The patient's long-standing habit of gutkha chewing and concurrent use of tobacco and alcohol significantly elevated his risk, in line with the synergistic effect of tobacco and alcohol on oral mucosal carcinogenesis as documented in previous studies. His poor nutritional intake further compounded the risk, consistent with evidence suggesting

that diets deficient in antioxidants and vitamins are associated with more aggressive tumor phenotypes.⁵

Clinically, this case presented with features suggestive of locally advanced disease—a non-healing ulcer, pain, bleeding, and radiographic evidence of bone involvement. Importantly, perineural invasion (PNI) was detected histologically. PNI is a well-established adverse prognostic marker in OSCC and has been shown to correlate with higher rates of local recurrence and reduced disease-free survival. Studies by Binmadi et al. and Chinn et al. have emphasized that PNI warrants consideration for adjuvant therapy even in early-stage tumors due to its potential for microscopic spread beyond clinically and radiologically evident margins.

The management strategy in this case was aligned with NCCN (National Comprehensive Cancer Network) guidelines for high-risk oral cavity cancers, recommending wide surgical excision, appropriate neck dissection, and postoperative radiotherapy in the presence of adverse pathological features such as PNI or bone involvement. Although a free flap was initially considered, a conservative reconstructive approach was selected based on intraoperative findings and patient condition. Literature supports that function-preserving surgery without compromising oncologic safety can be effective in select cases, especially when margins are clear and functional morbidity is minimal.⁶

A significant point of concern is the delay in presentation, which reflects a broader issue in oral oncology in developing countries. The majority of OSCC cases in South Asia present at stage III or IV, as shown in population-based studies by the ICMR and SEER databases. Delayed diagnosis often results from lack of awareness, sociocultural stigma, financial constraints, and the asymptomatic nature of early lesions. In the current case, the patient sought care only after 2 months of symptoms, by which time bone erosion had already occurred.

From a broader public health perspective, this case underlines the urgent need for targeted awareness programs, routine oral cancer screening in high-risk groups, and integration of tobacco cessation counseling into primary healthcare. Moreover, research into molecular markers for early detection, such as p53 mutations, EGFR overexpression, or salivary biomarkers, could play a pivotal role in identifying lesions with high malignant potential before clinical progression.⁷

In summary, this case reflects the typical clinical trajectory of gingivobuccal sulcus carcinoma in a habitual gutkha user, emphasizing the importance of early detection, adherence to evidence-based management guidelines, and the need for systemic interventions aimed at prevention and early diagnosis. Despite the presence of poor prognostic indicators

such as PNI and bone involvement, the patient responded well to multimodal treatment, underscoring the potential for favorable outcomes with timely and appropriate intervention.

5.1. Patient perspective

The patient acknowledged a lack of awareness regarding oral lesions and their malignant potential. He expressed satisfaction with the outcome and is now abstinent from gutkha and tobacco products, receiving regular counseling support.

5.2. Informed consent

Written informed consent was obtained from the patient for the publication of this case report and associated images. All procedures were conducted in accordance with the ethical standards of the institutional and national research committee.

6. Conclusion

This case reinforces the importance of early diagnosis and a comprehensive, multimodal treatment strategy for gingivobuccal SCC. Clinician awareness, patient education, and public health interventions remain key to improving long-term outcomes in oral cancers associated with tobacco and areca nut use.

7. Source of Funding

None.

8. Conflict of Interest

None.

References

1. Gupta B, Johnson NW, Kumar N. Global epidemiology of head and neck cancers: a continuing challenge. *Oncology*. 2016;91(3):13–23.
2. Nair S, Varghese BT, Swain M. Management of gingivobuccal sulcus carcinoma: surgical and adjuvant approaches. *Oral Oncol*. 2020;54(2):210–4.
3. Ang KK, Harris J, Wheeler R. Radiotherapy and chemotherapy in head and neck cancer treatment. *J Clin Oncol*. 2014;32(35):4012–9.
4. Luryi AL, Chen MM, Mehra S. Patterns of perineural invasion in oral squamous cell carcinoma and clinical outcomes. *Head Neck*. 2017;39(9):1727–33.
5. Warnakulasuriya S. Causes of oral cancer: an overview of current trends. *Oral Oncol*. 2009;45(4–5):309–16.
6. Chinn SB, Myers JN. Oral cavity carcinoma: Current management, controversies, and future directions. *J Clin Oncol*. 2015;33(29):3269–76.
7. Mendenhall WM, Werning JW, Fernandes R, et al. Management of oral cavity cancer. *Am J Clin Oncol*. 2008;31(5):501–10.

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