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PERIPHERAL AMELOBLASTOMA OF THE VENTRAL TONGUE MIMICKING A PREMALIGNANT LESION: A RARE CASE REPORT WITH IMMUNOHISTOCHEMICAL CONFIRMATION

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ABSTRACT

Background: Peripheral ameloblastoma is a rare benign extraosseous odontogenic epithelial tumor accounting for approximately 1–5% of all ameloblastomas. It predominantly arises from the gingival or alveolar mucosa, while occurrence on the tongue is exceptionally rare. Because chronic tongue ulcers frequently suggest premalignant or malignant lesions, diagnosis can be challenging.

Case Presentation: A 47-year-old man with type 2 diabetes mellitus, hypertension, and previous cerebrovascular accident presented with a progressively enlarging non-healing ulcer over the left ventral aspect of the tongue for three months associated with contact bleeding. Clinical examination revealed a 5 × 4 cm ulceroproliferative lesion without cervical lymphadenopathy. The lesion was clinically diagnosed as a premalignant lesion of the tongue. Wide local excision was performed.

Histopathological examination demonstrated islands of odontogenic epithelium composed of peripheral palisading columnar cells exhibiting reverse nuclear polarity surrounding central stellate reticulum-like cells with focal keratin formation. Surgical margins were free of tumor.

Immunohistochemistry demonstrated diffuse CK19 and PanCK positivity, focal calretinin and BCL2 positivity, low basal Ki-67 proliferative activity, and negative EMA expression, confirming the diagnosis of peripheral ameloblastoma.

The postoperative course was uneventful, and no recurrence was observed during follow-up.

Conclusion: Peripheral ameloblastoma involving the tongue is exceptionally uncommon and may clinically mimic premalignant or malignant lesions. Histopathological examination combined with immunohistochemistry is indispensable for establishing the diagnosis. Complete surgical excision provides an excellent prognosis.

KEYWORDS: Peripheral ameloblastoma; Tongue; Odontogenic tumor; Immunohistochemistry; CK19; Calretinin; Case report.

INTRODUCTION

Ameloblastoma is a benign but locally invasive odontogenic epithelial neoplasm originating from remnants of the enamel organ, dental lamina, or epithelial rests of Malassez. Peripheral ameloblastoma represents the uncommon extraosseous counterpart, constituting only 1–5% of all ameloblastomas.

Unlike conventional intraosseous ameloblastomas, peripheral ameloblastomas usually arise on the gingival soft tissues, particularly in the mandibular premolar region. Occurrence on the tongue is exceedingly rare, making preoperative diagnosis difficult. Clinically, persistent tongue ulcers are more commonly associated with squamous cell carcinoma, leukoplakia, chronic traumatic ulcers, or verrucous carcinoma.

Histopathological examination supported by immunohistochemistry remains the gold standard for diagnosis.

We report a rare case of peripheral ameloblastoma arising from the ventral surface of the tongue that clinically simulated a premalignant lesion.

Case Presentation

A 47-year-old male presented to the Department of General Surgery with complaints of a non-healing ulcer involving the ventral surface of the tongue for three months.

The lesion gradually increased in size and was associated with intermittent contact bleeding and mild tenderness. There was no history of dysphagia, odynophagia, tongue deviation, or significant weight loss.

The patient had known

- Type II diabetes mellitus
- Systemic hypertension
- Previous cerebrovascular accident

He was receiving regular medical treatment.

Clinical Examination
General examination revealed a conscious, oriented, moderately built and moderately nourished individual.
Vital signs were stable:
- Blood pressure: 120/70 mmHg
- Pulse rate: 84 beats/minute
- Respiratory rate: 16/minute
- Oxygen saturation: 99% on room air

Local examination demonstrated
- Ulceroproliferative lesion
- Left ventral surface of tongue
- Approximately 5 × 4 cm
- Contact bleeding present
- Mild tenderness
- No tongue deviation
- No cervical lymphadenopathy

Based on clinical findings, a provisional diagnosis of premalignant lesion of the tongue was made.

Investigations
Routine hematological and biochemical investigations were within acceptable limits for surgery.
Screening investigations included
- Hepatitis C virus antibody: Reactive (25.54)
- CT brain demonstrated chronic infarcts involving the left superior cerebellum, left cerebral peduncle, ventral midbrain and bilateral thalamic nuclei with mild cerebral and cerebellar atrophy.

The patient was cleared for surgery following cardiology and neurology evaluation.

Therapeutic Intervention
Wide local excision of the lesion was performed under general anesthesia.
Intraoperative findings revealed
- Localized ulceroproliferative lesion involving the ventral tongue
- No gross infiltration of deeper musculature

The lesion was excised with an approximate gross margin of 2 mm.
Hemostasis was secured.
Primary closure was performed using 2-0 chromic catgut sutures.
The postoperative period was uneventful.

Histopathological Findings
Gross examination revealed an ulcerated soft tissue specimen.
Microscopic examination demonstrated
- Hyperkeratotic stratified squamous epithelium
- Islands of odontogenic epithelium
- Peripheral palisading columnar basal cells
- Reverse nuclear polarity
- Central stellate reticulum-like cells
- Focal keratin formation
- Congested blood vessels
- Absence of epithelial dysplasia
- No evidence of malignancy

All surgical margins were free of tumor.
A diagnosis of Peripheral Ameloblastoma was suggested.

Immunohistochemistry
Immunohistochemical evaluation demonstrated the following findings:

Marker	Result	Interpretation
CK19	Diffuse strong membranous positivity	Odontogenic epithelial differentiation
PanCK	Diffuse strong positivity	Epithelial origin
Calretinin	Focal positivity in stellate reticulum-like cells	Supports ameloblastic differentiation
BCL2	Focal positivity	Basal cell survival marker
Ki-67	Low proliferative activity restricted to basal cells	Benign biological behavior
EMA	Negative	Excludes salivary gland epithelial neoplasm

These immunohistochemical findings confirmed the diagnosis of Peripheral Ameloblastoma.

Figure 1. Clinical photograph showing the ulceroproliferative lesion involving the left ventral surface of the tongue at presentation. The lesion measures approximately 5 × 4 cm with irregular margins, surface ulceration, slough, and areas of contact bleeding, clinically raising suspicion of a premalignant or malignant lesion.

Figure 2. Gross photograph of the excised surgical specimen obtained after wide local excision. Orientation sutures were placed to facilitate histopathological margin assessment. The specimen appears as an ulcerated soft tissue mass with an irregular external surface.

Figure 3. Intraoperative photograph demonstrating the ventral tongue lesion before excision. The ulceroproliferative lesion shows irregular raised margins with a granular surface involving the left ventral aspect of the tongue. A traction suture was applied to improve exposure and facilitate complete surgical excision.

Figure 4. Intraoperative photograph following wide local excision showing primary closure of the ventral tongue defect using interrupted absorbable sutures. Adequate approximation of the wound edges was achieved with satisfactory haemostasis.

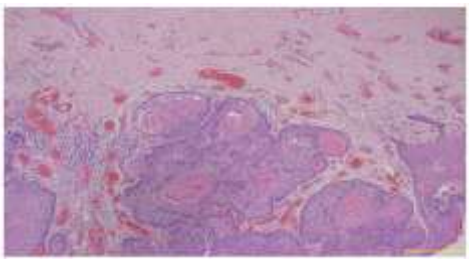

Figure 5. Histopathological features of peripheral ameloblastoma Photomicrograph showing odontogenic epithelial islands with peripheral palisading columnar cells enclosing stellate-reticulum-like cells, with focal keratinous material and surrounding inflammatory infiltrates.

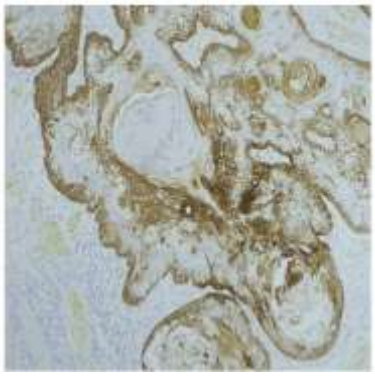

Figure 6. Immunohistochemical expression of CK19 and calretinin CK19 shows diffuse strong membranous positivity in the tumour islands, while calretinin demonstrates focal positivity in the stellate-reticulum-like areas.

Figure 7. Immunohistochemical profile of ameloblastoma PanCK shows diffuse strong membranous positivity, BCL2 shows focal positivity, Ki-67 staining is concentrated at the basal areas, and EMA is negative. The overall immunohistochemical profile is consistent with ameloblastoma.

Follow-up and Outcome

The patient recovered uneventfully after surgery.

- Oral feeding was resumed gradually.
- The surgical wound healed satisfactorily without complications.
- Clinical follow-up revealed no evidence of local recurrence.
- Long-term surveillance has been advised because delayed recurrence has been reported in peripheral ameloblastoma.

DISCUSSION

Peripheral ameloblastoma (PA) is a rare extraosseous odontogenic epithelial neoplasm, accounting for approximately 1–5% of all ameloblastomas. Unlike conventional intraosseous ameloblastoma, PA is confined to the soft tissues and usually arises from the gingival or alveolar mucosa without primary involvement of the underlying jaw bone. Since its first detailed descriptions, fewer than 250 cases have been reported worldwide, with the vast majority occurring in the mandibular gingiva. Consequently, involvement of the tongue is exceptionally uncommon and represents a significant diagnostic challenge because clinicians are more likely to suspect premalignant or malignant lesions than an odontogenic neoplasm.[1]

The exact histogenesis of peripheral ameloblastoma remains controversial. Several hypotheses have been proposed, including origin from remnants of the dental lamina (rests of Serres), pluripotent basal cells of the oral mucosal epithelium, or heterotopic odontogenic epithelial rests displaced during embryogenesis.[1] The occurrence of peripheral ameloblastoma in an unusual site such as the ventral tongue, where odontogenic epithelium is normally absent, further supports the possibility of ectopic odontogenic epithelial remnants or metaplastic transformation of basal epithelial cells. Similar pathogenetic mechanisms have been discussed by Rajesh et al., who reported one of the earliest cases of peripheral ameloblastoma involving the tongue.[2]

Clinically, peripheral ameloblastoma typically presents as a slow-growing, painless, firm sessile or pedunculated nodular swelling measuring less than 2 cm in diameter.[1,3] Ulceration and bleeding are uncommon and usually occur secondary to repeated trauma. In contrast, our patient presented with a relatively large (5 × 4 cm) ulceroproliferative lesion over the left ventral aspect of the tongue associated with contact bleeding and progressive enlargement over three months. Because of these atypical clinical features, the lesion was provisionally diagnosed as a premalignant lesion of the tongue, highlighting the difficulty in establishing an accurate preoperative diagnosis. Similar diagnostic uncertainty has been reported by Decani et al., who emphasized that peripheral ameloblastoma occurring outside the gingiva may clinically resemble squamous cell carcinoma or other malignant oral lesions owing to its nonspecific presentation.[3]

The principal differential diagnoses in our patient included squamous cell carcinoma, leukoplakia with dysplasia, chronic traumatic ulcer, verrucous carcinoma, granular cell tumor, traumatic fibroma and minor salivary gland neoplasms. The absence of cervical lymphadenopathy and tongue fixation reduced the likelihood of advanced oral squamous cell carcinoma; however, the persistent ulceration, contact bleeding and ulceroproliferative morphology warranted complete surgical excision to exclude malignancy. Similar diagnostic dilemmas have been described in previous reports of tongue peripheral ameloblastoma, where definitive diagnosis was established only after histopathological evaluation.[2]

Histopathological examination remains the gold standard for diagnosing peripheral ameloblastoma. In the present case, microscopic examination demonstrated characteristic islands of odontogenic epithelium composed of peripheral palisading columnar cells exhibiting reverse nuclear polarity surrounding loosely arranged stellate reticulum-like cells. No epithelial dysplasia or malignant transformation was identified, and the surgical margins were free of tumour. These findings are consistent with the classical histopathological features described by Nauta et al. and subsequent authors.[1,3] Unlike squamous cell carcinoma, which demonstrates invasive nests of atypical squamous epithelium with marked cytological atypia and frequent mitoses, our lesion lacked cellular pleomorphism, abnormal mitotic activity and infiltrative malignant architecture, thereby confirming its benign nature.

Immunohistochemistry plays an important role in confirming odontogenic differentiation and excluding histological mimics, particularly when lesions arise at unusual anatomical sites. In the present case, diffuse CK19 positivity strongly supported odontogenic epithelial differentiation, consistent with previous studies demonstrating CK19 expression in enamel organ-derived epithelium and ameloblastoma.[4,5] Pan-cytokeratin showed diffuse strong positivity, confirming the epithelial origin of the tumour. Calretinin exhibited focal positivity within stellate reticulum-like cells, a finding regarded as highly characteristic of ameloblastoma and useful in distinguishing it from other odontogenic cysts and epithelial lesions.[4] BCL2 demonstrated focal positivity, reflecting anti-apoptotic activity predominantly within peripheral tumour cells, while Ki-67 showed proliferative activity confined mainly to the basal layer, indicating low mitotic potential and benign biological behaviour. Negative EMA staining effectively excluded salivary gland epithelial neoplasms, thereby strengthening the diagnosis of peripheral ameloblastoma. Similar immunophenotypic profiles have been reported by Chhina et al. and Surya et al., both of whom demonstrated diffuse CK19 expression together with calretinin positivity and low Ki-67 proliferation indices in peripheral ameloblastoma.[5,6]

The present case shares several similarities with previously published reports but also demonstrates important differences. Rajesh et al. described a rare tongue peripheral ameloblastoma presenting as a painless localized lesion without ulceration, whereas our patient presented with a considerably larger ulceroproliferative lesion accompanied by contact bleeding, leading to an initial clinical diagnosis of a premalignant lesion.[2] Likewise, Decani et al. reported that most peripheral ameloblastomas are small gingival swellings managed conservatively by local excision, whereas our lesion arose from the ventral tongue and clinically simulated malignancy, necessitating wide local excision.[3] Histopathologically and immunohistochemically, however, our findings closely paralleled those reported in previous series, particularly with respect to CK19, PanCK, calretinin, BCL2 and Ki-67 expression.[4–6]

Complete surgical excision with tumour-free margins remains the treatment of choice for peripheral ameloblastoma. Unlike intraosseous ameloblastoma, which is associated with recurrence rates approaching 50–90% following conservative surgery, peripheral ameloblastoma generally demonstrates a much more favourable biological behaviour, with reported recurrence rates ranging from approximately 9% to 20%, largely attributed to incomplete excision.[1,3] In our patient, wide local excision achieved histologically negative margins, and the postoperative course was uneventful without evidence of recurrence during follow-up. Nevertheless, long-term clinical surveillance remains essential because delayed recurrence several years after surgery has been documented in the literature.[1,3]

The rarity of peripheral ameloblastoma involving the ventral tongue makes this case noteworthy. To the best of our knowledge, only a limited number of comparable cases have been reported worldwide.[2,3] This report further expands the existing literature by documenting an unusual clinical presentation that closely mimicked a premalignant tongue lesion and by demonstrating a comprehensive immunohistochemical profile including CK19, PanCK, calretinin, BCL2, Ki-67 and EMA. Awareness of this uncommon entity is important for surgeons, oral pathologists and head and neck oncologists, as recognition of its characteristic histopathological and immunophenotypic features allows accurate diagnosis, prevents overtreatment and ensures appropriate long-term follow-up.

CONCLUSION

Peripheral ameloblastoma involving the ventral tongue is an exceptionally rare clinicopathological entity that may closely mimic premalignant or malignant lesions of the oral cavity. Accurate diagnosis relies on careful histopathological evaluation supported by immunohistochemistry. Recognition of this uncommon presentation is important to prevent overtreatment. Complete surgical excision with clear margins provides an excellent prognosis, although long-term follow-up is recommended because of the possibility of delayed recurrence.

Learning Points

- Peripheral ameloblastoma may present as a chronic ulcerative lesion of the tongue and mimic oral squamous cell carcinoma.
- Tongue involvement is exceedingly rare and should be considered in the differential diagnosis of persistent ulcerative lesions.
- Histopathological examination supported by CK19, PanCK, calretinin, BCL2, Ki-67, and EMA immunostaining is essential for definitive diagnosis.
- Wide local excision with tumor-free margins remains the treatment of choice.
- Long-term follow-up is recommended despite the benign nature of the tumor because late recurrence has been reported.

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