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Peripheral Brown Tumor of the Jaws: Case Report and Literature Review

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Abstract

Background: Peripheral brown tumor is a rare extraosseous manifestation of hyperparathyroidism that can closely mimic peripheral giant cell granuloma (PGCG) in its clinical, radiographic, and histopathological presentation. Accurate diagnosis is essential because the treatment targets the underlying metabolic disorder rather than the lesion alone. **Case Presentation:** We report the case of a 38-year-old woman presenting with a painless, progressively enlarging gingival mass in the right maxillary vestibular region. Panoramic radiography revealed a localized osteolytic lesion beneath the soft tissue swelling. Histopathological examination demonstrated a multinucleated giant cell lesion with a fibrovascular stroma, suggesting either PGCG or a peripheral brown tumor. Further biochemical investigations showed markedly elevated serum parathyroid hormone (PTH) levels, confirming the diagnosis of a peripheral brown tumor associated with hyperparathyroidism. The lesion was surgically excised, and the patient was referred for endocrinological evaluation and treatment of the underlying endocrine disorder. **Literature Review:** A review of the published literature confirms that peripheral brown tumors of the jaws are exceptionally rare and frequently misdiagnosed because of their close resemblance to PGCG. Reported cases consistently emphasize the importance of correlating histopathological findings with biochemical investigations, particularly serum PTH levels, to establish the correct diagnosis and guide appropriate management. **Conclusion:** Peripheral brown tumor should always be considered in the differential diagnosis of giant cell lesions affecting the gingiva. Histopathology alone is insufficient to distinguish it from PGCG. A multidisciplinary approach integrating clinical, radiological, histological, and biochemical findings is essential for early diagnosis, appropriate treatment of hyperparathyroidism, and prevention of recurrence.

Subject Areas

Dentistry

Keywords

Peripheral Brown Tumor, Hyperparathyroidism, Peripheral Giant Cell Granuloma, Jaws, Gingival Lesion, Giant Cell Lesion

1. Introduction

A brown tumor is a rare, non-neoplastic pseudotumoral lesion that develops secondary to primary, secondary, or tertiary hyperparathyroidism. It arises from excessive bone remodeling caused by increased osteoclastic activity under elevated parathyroid hormone (PTH) levels. The peripheral form occurring in soft tissues adjacent to the alveolar bone is exceptionally rare and typically involves the gingiva. Clinically, it may strongly resemble more common lesions such as peripheral giant cell granuloma (PGCG) [1].

Accurate diagnosis is essential because treatment differs substantially: PGCG typically requires local surgical excision and removal of irritative factors, whereas brown tumors necessitate systemic management of the underlying hyperparathyroidism.

This paper presents a clinical case highlighting the diagnostic difficulty of peripheral brown tumors and provides a literature-based synthesis of their key features and management.

2. Clinical Case

A 38-year-old woman presented with a progressively enlarging vestibular gingival swelling in the right maxillary region over a four-month period.

Intraoral examination revealed a firm, painless, sessile, reddish mass on the alveolar crest. (**Figure 1**).

Panoramic radiography showed a localized osteolytic zone underlying the lesion (**Figure 2**).

The lesion was surgically excised and submitted for histopathological analysis (**Figure 3**).

Microscopically, the specimen showed a lobulated architecture with numerous clustered multinucleated giant cells, fibroblasts, and histiocytes in a richly vascularized stroma (**Figure 4**).

These features were compatible with a giant cell lesion such as PGCG or brown tumor. Subsequent laboratory tests revealed markedly elevated PTH levels, which supported the diagnosis of a peripheral brown tumor.

The patient was referred to endocrinology for further evaluation and management of hyperparathyroidism.

The patient was closely monitored through regular clinical follow-up visits. Healing progressed uneventfully, with satisfactory soft tissue repair observed one week after surgery (**Figure 5**). At the one-year follow-up, the surgical site demonstrated complete mucosal healing with no clinical evidence of recurrence (**Figure 6**). In parallel, the patient remained under endocrinological care for the manage-

ment of the underlying hyperparathyroidism. This favorable outcome highlights the importance of combining local surgical treatment with appropriate systemic management and long-term follow-up to minimize the risk of recurrence.

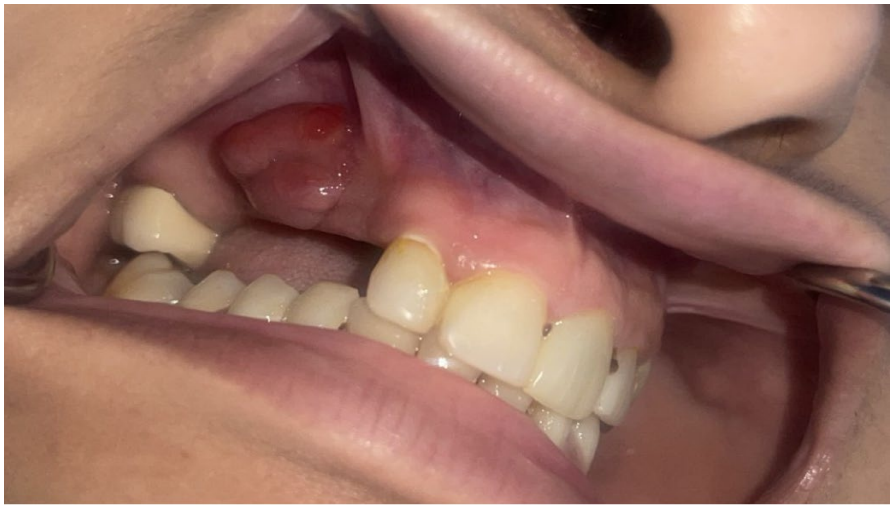

Figure 1. Intraoral view illustrating the lesion.

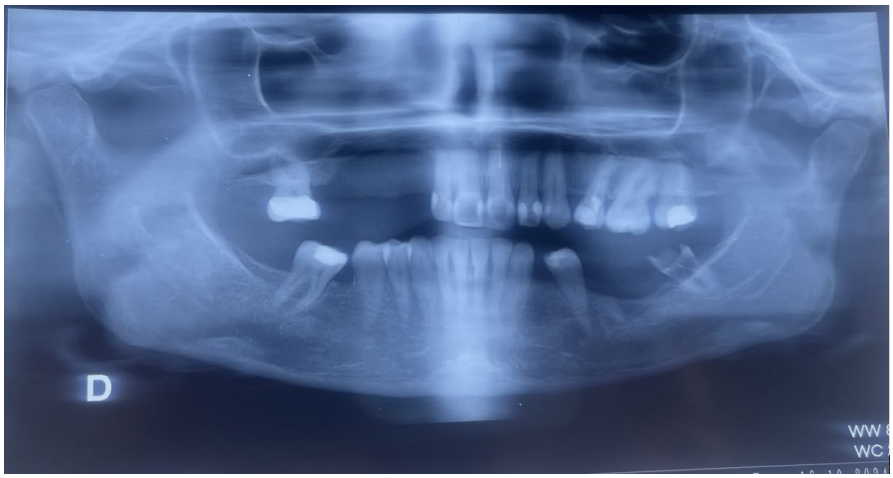

Figure 2. Panoramic radiograph revealing marked osteolysis adjacent to the lesion in the right maxillary alveolar ridge.

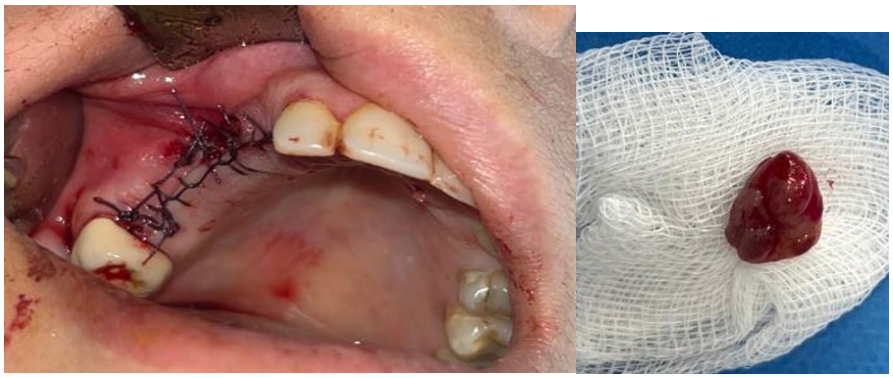

Figure 3. Macroscopic view of the excised lesion (2 × 3 cm).

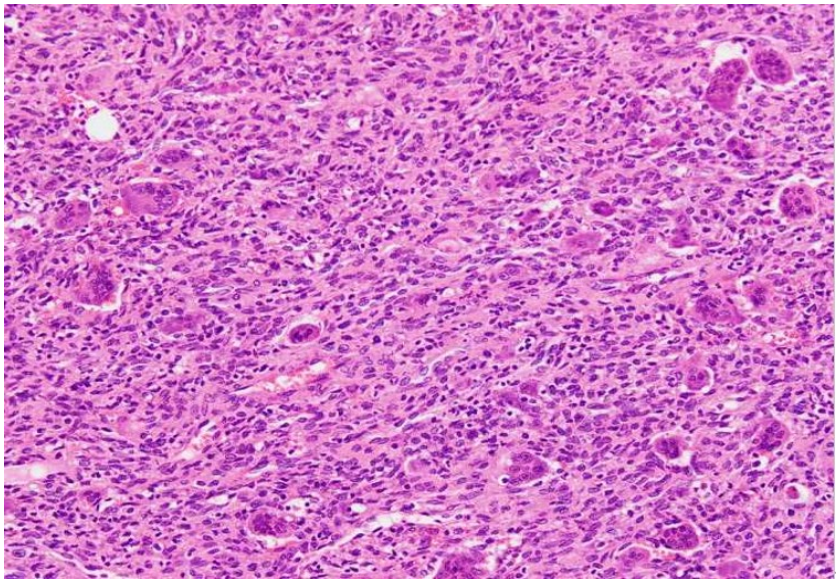

Figure 4. H&E-stained histological section showing multinucleated giant cells within a fibroblastic-histiocytic stroma.

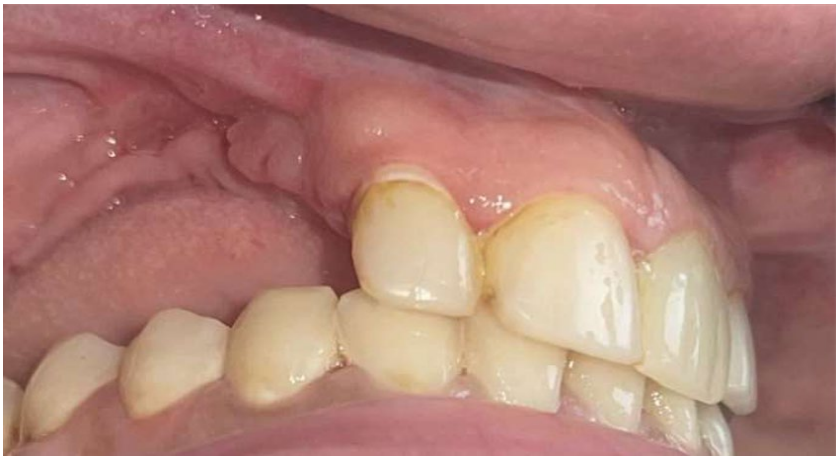

Figure 5. Intraoral view showing healing after 7 days.

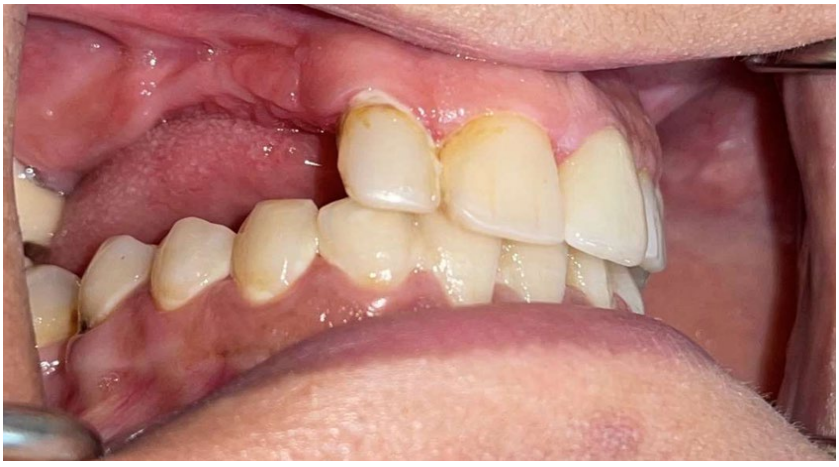

Figure 6. Follow-up photograph after 1 year.

3. Discussion

Peripheral giant cell lesions of the jaws mainly include PGCG and peripheral brown tumor. Their clinical, radiographic, and histologic overlap makes distinguishing them based on morphology alone difficult. PGCG is a benign reactive lesion generally resulting from chronic irritation or trauma [2]. In contrast, brown tumors represent a skeletal manifestation of hyperparathyroidism and reflect systemic metabolic disturbance rather than a local reactive process [3].

Both lesions contain multinucleated giant cells, hemosiderin deposits, and a fibrovascular background. Thus, systemic assessment is essential: elevated serum PTH strongly suggests a brown tumor [4], whereas normal values favor PGCG.

Peripheral brown tumors most often occur in women over 30 years of age and are commonly located in the edentulous anterior mandible, though maxillary involvement occurs [5]. Clinically, they present as painless, red-to-purple soft tissue masses that may be sessile or pedunculated. Radiographs may reveal underlying bone resorption. Histologically, brown tumors contain abundant multinucleated giant cells, hemosiderin-laden macrophages, and a rich vascular network, giving their characteristic brownish appearance [3].

Management requires both surgical excision and systemic correction of hyperparathyroidism. Parathyroidectomy is indicated in primary hyperparathyroidism, while medical management is used for secondary or tertiary forms, often associated with chronic kidney disease. Recurrence rates remain low (5% - 11%) if both local and systemic factors are appropriately addressed. Long-term follow-up is essential.

4. Literature Review

These studies underline the diagnostic ambiguity between PGCG and peripheral brown tumors. Identifying a systemic brown tumor is crucial, as delayed diagnosis

Table 1. Summary of key literature on peripheral brown tumor and PGCG.

Author(s)	Year	Study type	Key findings	Relevance to brown tumor
Chaparro-Avendaño *et al.*	2005	Case series + literature review (5 PGCG cases)	PGCG is a common gingival giant cell lesion with clinical and histologic similarity to brown tumors; female predilection.	Highlights diagnostic confusion and the need to exclude systemic causes (1).
Cloutier *et al.*	2007	Retrospective analysis	PGCGs may occur around implants; associated with local irritation; histology overlaps with other giant cell lesions.	Supports role of trauma in PGCG and importance of distinguishing it from metabolic lesions (2).
Batsakis JG	1986	Pathology consultation	Defines brown tumor as a manifestation of hyperparathyroidism; central and peripheral forms described.	Foundational reference establishing the concept of brown tumor (3).
Triantafillidou *et al.*	2006	Case report + review	Describes peripheral brown tumor regressing after parathyroidectomy.	Confirms metabolic etiology and effect of systemic treatment (4).
Reséndiz-Colosia *et al.*	2014	Case report	Peripheral brown tumor mimicking PGCG; diagnosis confirmed by elevated PTH.	Emphasizes importance of PTH testing in giant cell lesions (5).

Table 2. Clinical cases of peripheral brown tumors reported in the literature.

Author(s)	Year	Patient	Location	Diagnosis clue	Treatment	Outcome
Triantafillidou *et al.*	2006	Female, ~50 y/o	Mandibular gingiva	Elevated PTH, lesion mimicking PGCG	Parathyroidectomy (systemic only)	Complete regression
Reséndiz-Colosia *et al.*	2014	Female, 48 y/o	Anterior mandible	Histology + ↑ PTH	Surgical excision + endocrine therapy	No recurrence
Batsakis JG	1986	Not specified	Gingival/peripheral	Pathology-based analysis	Not detailed	Highlighted importance of metabolic screening
Current case (Harrizi & Kissi)	**2025**	**Female, 38 y/o**	**Right maxillary vestibular gingiva**	Histology + ↑ PTH	**Surgical excision + endocrinologist referral**	**Ongoing endocrine management**

may postpone necessary endocrinological management. A multidisciplinary approach is strongly advised. Together, these studies underline the diagnostic ambiguity between PGCG and peripheral brown tumors. Identifying a systemic brown tumor is crucial, as delayed diagnosis may postpone necessary endocrinological management. A multidisciplinary approach is strongly advised (Table 1, Table 2).

5. Conclusion

Peripheral brown tumors are rare but clinically important lesions that closely mimic common reactive entities such as PGCG. Because clinical and histological features overlap, a thorough systemic evaluation including serum PTH measurement is essential for correct diagnosis. Treatment requires both surgical excision and management of the underlying hyperparathyroidism. Early identification and coordinated multidisciplinary care are key to preventing recurrence and systemic complications [4].

Conflicts of Interest

The authors declare no conflicts of interest.

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