

Palatogingival Groove And Periapical Cyst – A Rare Case Report

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Abstract: The palatogingival groove (PGG) is a rare developmental anomaly predominantly affecting the maxillary lateral incisors. It is a structural defect that can predispose the tooth to plaque accumulation, leading to complex periodontal and endodontic complications. This article aims to report a rare case of a 27-year-old male patient with a deep palatogingival groove in tooth 12, associated with a periapical cyst extending to adjacent teeth (11 and 13). Clinical and radiographic evaluations revealed a non-vital tooth with a well-defined periapical radiolucency. Surgical management involved the extraction of the affected tooth and enucleation of the cyst via a buccal approach. Postoperative healing was uneventful. The case underscores the importance of early detection and multidisciplinary management of PGGs to prevent severe complications. A comprehensive approach integrating clinical awareness, radiographic evaluation, and appropriate surgical intervention is essential for optimal patient outcomes.

Key Words: Palatogingival groove, developmental anomaly, endoperio lesion, treatment

INTRODUCTION:

The palatogingival groove (PGG) is a rare developmental anomaly that primarily affects the palatal aspect of permanent maxillary incisors, especially the lateral incisors. This groove is also referred to by various names, including radicular lingual groove, distolingual groove, palatal gingival groove, and radicular palatal groove.¹ It typically originates near the cingulum and extends apically, varying in both depth and length. In rare instances, similar grooves may also appear on the facial root surface.^{2,3}

The condition was first identified by Black in 1908, who described it as a radicular groove.⁴ Later, in 1971, Kovacs introduced the term "syndesmocorono- radicular tooth" to describe this anomaly. The prevalence of PGG has been reported to range from 2.8% to 8.5%.⁵

Although the exact etiology of PGG remains uncertain, several theories have been proposed. These include: (a) developmental disturbances during embryogenesis, potentially involving abnormal folding of Hertwig's epithelial root sheath; (b) a variation of dens invaginatus; (c) genetic predisposition; and (d) a possible attempt at forming an additional root.^{6,7}

The depth and apical extension of the groove play a crucial role in determining the prognosis and

systems exist to categorize PGG. Based on its position, the groove may appear on the mesial, distal, or central (mid-palatal) aspect of the tooth. Kogon et al. further classified PGGs according to their depth and invagination toward the pulp chamber into three types:

- Type 1 – Shallow/flat (<1 mm),
- Type 2 – Deep (>1 mm),
- Type 3 – Closed tube configuration.⁸

PGGs create an ideal niche for plaque and calculus accumulation, thereby contributing significantly to periodontal and periapical pathologies. In more severe cases, the groove may extend into the pulp chamber, leading to pulpal involvement.⁹

This article presents a rare case of PGG associated with intermittent discharge from the maxillary right lateral incisor (#12). The condition was managed surgically to address the underlying pathology.

CASE REPORT

A 27-year-old male patient, otherwise healthy, presented to our outpatient department with a chief complaint of intermittent discharge from the palatal aspect of the right maxillary anterior region over the past three months. The patient had previously sought care from a private practitioner and was prescribed a one-week course of antibiotics (Amoxiclav 650 mg, twice daily) and analgesics (Ketorolac DT 10 mg, twice daily).

There was no reported history of trauma, and the patient's medical, dental, and family histories were unremarkable.

Extraoral examination revealed no facial asymmetry. Intraorally, the crown of tooth 12 appeared intact, non-carious, and non-tender to percussion. Pulp vitality testing, including thermal and electric pulp tests, yielded negative responses. A distinct palatogingival groove was noted on the mesiopalatal surface of 12, originating from the cingulum, extending into the gingival sulcus, and continuing apically along the palatal root surface. No sinus tracts were evident on either the labial or palatal gingiva. Oral hygiene was assessed as fair, with a mild 4 mm periodontal pocket present on the palatal aspect of tooth 12.

Orthopantomographic (OPG) (fig. 1) revealed a well-defined, corticated periapical radiolucency larger than 1.5 cm, extending to involve the roots of teeth 11, 12 and 13, suggestive of a periapical cyst. Additionally, 12 exhibited a blunderbuss canal with an open apex.



Fig 1: Orthopantomographic (OPG) radiograph showing a well-defined, corticated periapical radiolucency involving the roots of teeth 11, 12 and 13, suggestive of a periapical cyst. Additionally, 12 exhibited a blunderbuss canal with an open apex.



Figure 2(a) 2(b)
Fig 2: (a) Intraoperative view showing surgical site following extraction of tooth 12 and exposure of the periapical lesion through a buccal approach. Note the extent of the bone defect and granulation tissue removal in progress. (b) Immediate postoperative intraoral view showing sutures placed after extraction of tooth 12 and enucleation of the

periapical cyst.

The treatment plan was discussed in detail with the patient, and informed consent was obtained. Tooth 12 was extracted under local anaesthesia fig. 3, followed by surgical enucleation of the cyst via an intraoral buccal approach as shown in fig. 2a. The procedure was completed with suture placement (fig. 2b).



Fig3: Extracted maxillary right lateral incisor showing evidence of periapical pathology at the apex.

Postoperative care included an antibiotic regimen, and follow-up indicated satisfactory healing.

DISCUSSION

The palatogingival groove (PGG) is a developmental morphological anomaly that predominantly affects maxillary incisor teeth, with a notably higher incidence in lateral incisors (4.4–5.6%) compared to central incisors (0.28–3.4%).¹⁰ As a structural irregularity, the PGG holds significant clinical relevance, as it provides an optimal environment for plaque retention and bacterial colonization, which may precipitate periapical or periodontal infections. More than 50% of these grooves extend beyond the cemento-enamel junction (CEJ) onto the root surface, heightening the risk for combined endodontic-periodontal involvement.¹¹

The depth and apical extension of the groove play a crucial role in the severity of the associated pathology. Based on their degree of invagination towards the pulp, PGGs can be classified as shallow/flat (<1 mm), deep (>1 mm), or closed tube-type grooves.¹¹

Further classification by Goon et al. divides PGGs into simple and complicated types. Simple grooves, which do not communicate with the pulp, are generally benign and represent a minor infolding of Hertwig's epithelial root sheath. In contrast, complicated grooves involve lateral or apical communication with the pulp, often due to significant invagination depth. These are more

likely to result in complex endo-perio lesions, present with a guarded prognosis, and typically necessitates a multidisciplinary treatment approach.¹²

In the present case, the groove was deep, extending onto the root surface, facilitating bacterial ingress and resulting in the development of a periapical cyst. Given the extent of the lesion and the compromised prognosis of tooth #12, the decision to proceed with extraction and surgical enucleation was clinically justified.

The surgical management of periapical cysts can include enucleation, marsupialization, or a combination of both, depending on the size and location of the lesion.¹² In this instance, enucleation via an intraoral buccal approach was chosen following tooth extraction. Postoperative healing was uneventful, aided by appropriate antibiotic coverage to control residual infection.

This case underscores the importance of early diagnosis and timely intervention in managing PGG-related lesions. Clinicians should maintain a high index of suspicion for such developmental anomalies during routine examinations. A multidisciplinary approach, combining preventive, endodontic, periodontal, and surgical strategies, is often essential to ensure optimal outcomes. Preventive measures, including early detection, groove sealing, and periodic monitoring, play a vital role in reducing the likelihood of severe complications arising from this otherwise subtle anomaly.

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How to cite this Article:

Ingale N, Rakaraddi M, Vizarat A, Paraye S, Thakare A. Palatogingival Groove And Periapical Cyst – A Rare Case Report. Journal of Interdisciplinary Dental Sciences. 2025 Jan-Jun;14(1):24-27

