

Palatogingival Groove – A Conservative Approach

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Aim:

Background:

Palatogingival groove (PGG) is a developmental anomaly frequently linked to maxillary lateral incisors, and is a known risk factor for endodontic periodontal lesion. The groove acts as a plaque retentive niche and may predispose the tooth to localized periodontal destruction and, if left untreated, pulpal involvement.

Case presentation: This case report describes a 21 year old female presenting with brownish black discoloration the palatal surfaces of maxillary lateral incisors without pain or history of trauma. clinical examination revealed bilateral palatogingival groove. Pulp vitality testing demonstrated normal pulpal response, and radiographic examination confirmed

superficial radiolucent defects without evidence of periapical pathology. Based on this findings lesion was diagnosed as Type I Palatogingival grooves.

Management: A careful diagnostic combined with conservative approach was used to treat the defect through preventing its progress by initial periodontal therapy oral prophylaxis. The grooves were conservatively managed by odontoplasty (saucerization), caries excavation and followed by restoration.

Outcome: Clinical evaluation during follow-up period demonstrated satisfactory healing, no progression of periodontal destruction. The restoration remained intact, and the teeth showed positive result to vitality testing.

Conclusion: Conservative management of Type Palatogingival grooves can effectively arrest the disease progression and preserve pulpal vitality when diagnosed early. Elimination of the groove anatomy and meticulous plaque control provides a predictable and minimally invasive treatment approach.

Keywords:

Endodontic – periodontal lesion

Developmental Anomaly

Dens Invaginatus

Hertwigs Epithelial Root Sheath

Background

Introduction

The Palatogingival groove (PGG), also known as the palato-radicular groove or radicular lingual groove, is a developmental anomaly primarily found on the lingual aspect of maxillary incisor teeth. Its occurrence rate ranges from 2.8 to 8.5%, commonly observed in maxillary lateral incisors and less frequently in central incisors. The exact cause of this groove remains debated, with theories suggesting it could be due to an infolding of the enamel organ and Hertwig's epithelial root sheath during tooth development or an aborted additional root formation attempt. However, more recently, it has been related to the concept of "alteration of genetic mechanisms."¹

Maxillary lateral incisors are amongst those few teeth frequently known to exhibit diverse morphologic and anatomic abnormalities such as peg shape, dens invaginatus, Eagle's talon, palatogingival groove, germination, fusion and accessory root. In most cases, the location and anatomy of these malformations are such that they promote adherence of plaque and render relatively easy involvement of the dental pulp contributing significantly towards the development of endodontic - periodontal lesions.²

Frequently, recognizing and managing PGG is complicated and requires an interdisciplinary strategy for combined endodontic-periodontal lesions. However, no controlled investigations have been conducted despite a large number of case reports. Therefore, the aim of this article was to review the literature on the diagnosis and treatment of PGG, thereby helping clinicians to successfully manage PGG.

Case Description

A 21-year-old female patient reported to the Department of conservative dentistry and endodontics with complaint of brownish-black discoloration on the palatal aspect of the maxillary anterior teeth. The patient did not report any history of trauma, pain, or discomfort associated with the affected teeth.

Clinical examination revealed discoloration on the palatal surfaces of the maxillary lateral incisors (teeth 12 and 22). Periodontal evaluation showed the presence of localized periodontal pockets in relation to teeth 12 and 22, bilaterally present. The affected areas exhibited plaque accumulation, likely facilitated by underlying anatomical irregularities.



Investigations: Pre-operative investigations included digital radiographs (RVG), intraoral periapical (IOPA). Radiographs demonstrated radiolucent areas associated with teeth 11 and

22. The radiolucency involved enamel and dentin and was seen approaching the pulp space, suggestive of underlying structural anomaly or pathology

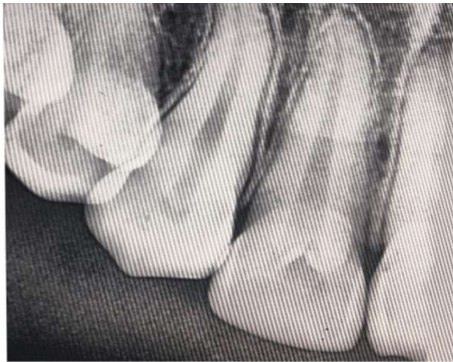


Figure 2 (A) - Pre Operative RVG



Figure 2 (B) - Pre Operative clinical

Based on the clinical and radiographic findings, a developmental anomaly such as a palatogingival groove was suspected, contributing to plaque retention, periodontal breakdown, and possible pulpal involvement.

Outcome the clinical effectiveness of a conservative management of Palatogingival groove is possible provided that the etiology is eliminated followed by precise elimination of the groove and restoration followed by regular follow up,

Treatment Planning

The treatment objectives were:

1. Eliminate the etiological factors contributing to the lesion.
2. Preserve the involved teeth.
3. Restore periodontal and pulpal health
4. Restoration of the affected tooth structure and esthetics



Figure 5- Post Operative clinical

Discussion

The presence of a palatogingival groove is considered to be an important contributing factor to the development of localized chronic periodontitis, for it favors the accumulation and proliferation of bacterial plaque deep into the periodontium. It is a developmental anomaly of

variable extent and depth that may or may not involve a communication between the pulp cavity and the periodontal tissue. These defects usually occur on the lingual surface of the mid palatal, mesial, or distal region of the tooth. The groove is more likely to form on the lateral surfaces.³

In our case, palatogingival groove existing on the lateral incisor was classed as mild PGG. This was apparent on radiographic examination, and confirmed later on during clinical probing, the origin of groove on the lingual surface of the crown could be clinically identified though most part of the groove.

Teeth with Type I grooves were recognized to have grooves extending apically not beyond the coronal third of the root and with a normal root canal configuration. Type II grooves extended beyond the coronal third of the root corresponding to a normal or simple root canal. Type III grooves extended beyond the coronal third of the root while corresponding to a complex root canal system. Mostly, C-shaped canals, invagination canals and additional root with secondary canals have been seen to be associated with Type III grooves. Deep grooves tend to deform the contour of the pulp cavity subjacent to the invagination along with diminished enamel and dentin thickness predisposing to pulpal involvement.

Amongst the several known treatment strategies for correction of periodontal pathology, the one most discussed includes saucerization or odontoplasty of the groove; best known to treat simple/shallow grooves. Complicated grooves in addition to odontoplasty may necessitate additional measures like restoration of the defect with amalgam, GIC, composite or mineral trioxide aggregate (MTA).²

Among the various proposed treatment options, clinicians have to choose a method to eliminate the causative pathologic factor and achieve a favourable outcome. First, it is necessary to examine whether the pulp is involved in the pathologic change. If the pulp is in a

pathologic state, endodontic treatment is recommended first. It is important to determine the dentin thickness of the palatal surface of the canal near the groove, which can be very thin.

Treatment of mild PGG

In the mild type of PGG with physiologic mobility and shallow grooves, odontoplasty in conjunction with periodontal treatment, including gingivectomy or subgingival root planing, is recommended. The pathology caused by the groove space is expected to be eliminated by grinding the groove or sealing it with one of a variety of filling materials. ‘Saucerization’ is one method for treating the mild form of PGG that involves grinding the groove to the level of the crestal bone with a rotary cutting and polishing instrument.⁴

In this case, in initial phase plaque removal and oral prophylaxis was done. After the initial phase of thorough scaling and root planning, occlusal interference on the incisor was eliminated by odontoplasty. Then caries excavation was done using a small round diamond bur) was accomplished followed by sealing the groove with glass ionomer cement

CONCLUSION

The management of the Palatogingival groove requires a systematic approach involving early diagnosis, investigation and treatment planning. This case demonstrates the successful conservative approach of treating the Palatogingival groove in its early form. Regular follow up allowed monitoring the condition and patient satisfaction. This outcome highlights the clinical effectiveness of a conservative management of Palatogingival groove provided that the etiology is eliminated followed by precise selection of the method employed and regular follow ups.

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