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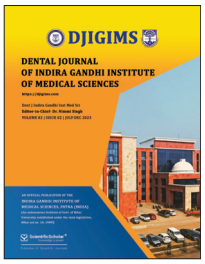

Case Report

Palatogingival Groove: A Plaque Trap Leading to Bone Loss in a Maxillary Lateral Incisor – A Rare Case Report

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ABSTRACT

Palatogingival grooves are one of the most important anatomical anomalies, typically appearing as indentations on the palatal aspects of maxillary incisors. These grooves are excellent harbor for dental plaque accumulation as they act as a plaque-retentive factor, leading to the development of periodontal diseases. Treatment options for palatogingival grooves include curettage, saucerization, sealing the groove using GIC cement, and endodontic and periodontal therapy. In this case report, we describe a groove located in the palatogingival area of the left maxillary lateral incisors in a male patient and discuss its regenerative management using both nonsurgical and surgical approaches.

Keywords: Palatogingival groove, Radicular groove, Developmental tooth anomaly, Localized chronic Periodontitis.

INTRODUCTION

Several anatomical abnormalities, such as cervical enamel projections, enamel pearls, short tapered roots, bifurcation ridges, developmental groves, and so on, may occur during tooth development and can be predisposing factors for periodontal destruction and bone loss.[1,2] Palatogingival grooves are among the most important anatomical anomalies, typically appearing as indentations on the palatal surfaces of maxillary incisors. These grooves often start at the cingulum of the affected teeth and extend a significant distance along the root surface.[3] They can also affect the mandibular incisors.[4] In 1908, Black referred to them as radicular grooves [5] while the term "palatogingival groove" was coined by Lee et al. in 1968.[3] Other names for this anomaly include radicular lingual groove, syndesmo coronoradicular groove, distolingual groove, and radicular groove.[4]

The palatogingival groove becomes an excellent harbor for dental plaque because it acts as a plaque-retentive factor, which can lead to the development of periodontal diseases. Periodontal disease begins with gingivitis and can progress to localized periodontitis in the affected tooth, potentially involving pulpal involvement.[6-8] Deeper grooves can provide direct access to the pulpal chamber through accessory canals, leading to pulpal infection and resulting in combined endo-periodontal lesions.[9]

In the past, teeth affected by such groves were often extracted and replaced provisionally because the grooves were considered to have a hopeless prognosis.[10] Current treatment options for

palatogingival grooves include curettage, saucerization (which involves eliminating the groove), sealing the groove with GIC cement, and combined endodontic and periodontal therapy using guided tissue regenerative procedures.[11] In this case report, we describe a case of a palatogingival groove located in the maxillary lateral incisors in a male patient and its regenerative management.

CASE REPORT

A 28-year-old male patient presented to the Department of Periodontology, Indira Gandhi Institute of Dental Sciences, Puducherry, with a complaint of pain in the upper left front teeth region for 1 week. Elicitation of the patient's past medical, dental, and family history revealed no history of any trauma. Extraoral examination showed no facial asymmetry. Intraoral region examination revealed clinical signs of gingival inflammation and periodontal pockets of 10 mm deep on the mid-palatal aspect of tooth 22 [Figure 1]. However, a palatogingival groove was observed on the midpalatal aspect of the same tooth.

Periodontal Management

After explaining the treatment plan, written consent was obtained from the Patient. On the day of the examination, scaling followed by root planing was carried out, and the patient was asked to report after 1 week. Surgical regenerative therapy was planned for the patient. After administrating a local anesthetic, a flap was raised. Later, soft tissue debridement was then carried out to remove granulation tissue, allowing clear visualization of the extent of the palatogingival grove [Figure 2]. The groove was smoothened using an air rotor bur and checked for irregularities, and glass ionomer cement was applied over the entire groove [Figure 3]. Osteogen bone substitute, which is a bioactive resorbable calcium apatite bone graft, was placed around the vertical bone defect [Figure 4]. Simple interrupted sutures were used, and a periodontal pack was applied. The patient was recalled after a week for suture removal.

Figure 1: Preoperative.

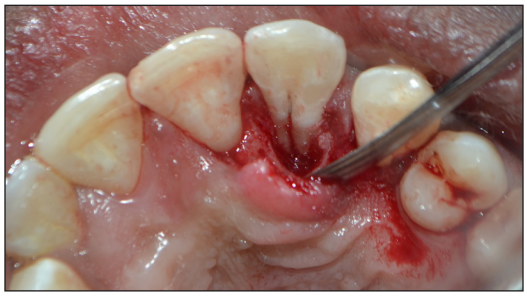

Figure 2: Palatogingival groove.

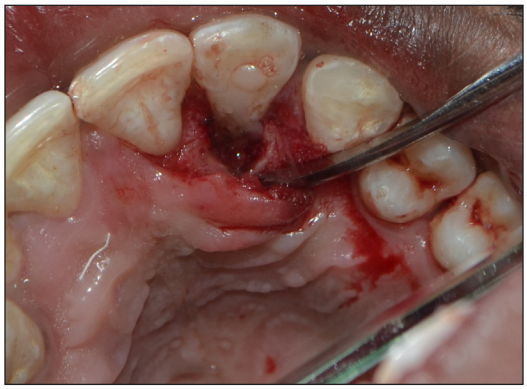

Figure 3: Obliteration of groove using glass ionomer cement.

Figure 4: Placement of bone graft.

DISCUSSION

Localized chronic periodontitis can occur due to the accumulation of bacterial plaque, which subsequently proliferates subgingivally into the periodontium.[12] Developmental or anatomical abnormalities may also serve as iatrogenic factors for the accumulation of plaque because they act as plaque-retentive factors.[7] One such important anomaly is the palatogingival groove, which becomes an excellent harbor for dental plaque, leading to the development of periodontal diseases.[9,13] Withers et al. stated that the palatogingival groove is often found in patients with poor periodontal health.[14]

The palatogingival groove can be clinically identified as a V-shaped notch seen on the palatal aspect of the enamel, extending apically on the root surface.[15] The groove is challenging to identify using radiographs due to the

superimposition of tooth structure over the pulp canal space. To address this issue, multiple radiographs with different horizontal projections can be taken to identify the groove.[16] Patients may exhibit symptoms such as acute or dull pain in the affected tooth, tenderness on percussion, shallow or deep pockets, occasional tooth mobility, and pus discharge.[16-18] However, some patients may be completely asymptomatic.[19]

The most common materials used for the obliteration of the grove include glass ionomer cement [18] and amalgam. Recently, iRoot BP Plus and mineral trioxide aggregate [10] have also been used. If the grooves have moderate to deep periodontal pockets, a regenerative approach involving both periodontal interventions and regenerative procedures will be necessary.[20]

Using CBCT instead of traditional radiographs provides a more accurate visualization of any endo-perio connection, the internal anatomy of the root canal, and a precise evaluation of the groove depth.[21]

CONCLUSION

Detection of the palatogingival grooves, whether clinically or radiographically, is important due to their diagnostic complexity. If not properly diagnosed and treated, the prognosis of the affected teeth may become hopeless. The grooves should be treated based on the depth of the groove, the type of bone defect, and its extent.

Ethical approval

Institutional Review Board approval is not required.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of Artificial Intelligence (AI)-Assisted Technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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