

Early Detection of Palatogingival Groove and Minimal Management: A Case Report

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ABSTRACT

Palatogingival groove is a rare developmental anomaly of a tooth, which is often located at the palatal side of the maxillary lateral incisor following maxillary central incisors. These palatogingival groove leads to endodontic and periodontal problems and eventually tooth loss if not diagnosed appropriately. It is a challenge for a clinician to diagnose it early; likewise treatment protocol is also unpredictable. Hereby, is a case of a 17-year-old female patient, based on history, clinical examination and radiographs timely identification of periodontitis due to a palatogingival groove was diagnosed in bilateral maxillary lateral incisors. Early diagnosis enabled conservative treatment, arrested disease progression, and showed regenerative outcomes after one year of follow-up.

Keywords: Guided tissue regeneration; peri-endo lesion; tooth abnormalities.

INTRODUCTION

Palatogingival groove (PGG) or Palatoradicular groove (PRG) was initially given by Black in the year 1908 and was considered as a developmental anomaly. It is defined as “a developmental groove in the root, that when present is usually found on the palatal aspect of the maxillary incisor teeth”.¹ Prevalence of PGG was first surveyed by Everett et al in 1972 in 625 extracted maxillary central incisors. They reported a prevalence of less than 2% with 0.5% of PGG extending into apical area.² Latest systematic review and meta-analysis suggested the prevalence of PGG is 1.5% with maximum found in maxillary lateral incisors.³ There are various classifications of PGG based on the location of groove, the extent and complexity of groove and degree of invagination of groove towards pulp

cavity.⁴ Amongst them most commonly used is a classification based on extent of groove on surface of root given by Gu.⁵

Type I: the groove is short (not beyond the coronal third of the root). Type II: the groove is long (beyond the coronal third of the root) but shallow, corresponding to a normal or simple root canal. Type III: the groove is long (beyond the coronal third of the root) and deep, corresponding to a complex root canal system.

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The actual progression of disease is still debatable. Some explain the progression from typically from accessory canals, lateral canals, the groove suggesting to be endodontic-periodontal lesion, while some authors have insisted that pulpal and periodontal lesion is unrelated.⁴

There is inherent difficulty in treating PGG due to diagnostic complexity for practitioners. Therefore, this case demonstrates an early diagnosis along with successful management of periodontal lesion due to PGG with follow up of one year.

CASE REPORT

A 17-year-old healthy female patient visited the Department of Periodontology and Oral Implantology, KUSMS, Dhulikhel hospital, with the chief complaint of bleeding while brushing teeth from upper front region of jaw for seven days. Bleeding stopped spontaneously after gargling

with water. Clinical examination revealed bleeding on probing on the palatal aspects of teeth 12 and 22. Further examination showed localized signs of gingival inflammation, and periodontal probing depth at the mid-palatal aspect was 7 mm on tooth 12 and 6 mm on tooth 22 (Figures 1 and 2). On evaluation of the cause of bleeding using tactile perception with a Hu-Friedy™ dental explorer, a palatogingival groove was detected extending subgingivally. Pulp vitality testing was performed using thermal stimuli. Both heat and cold tests elicited no response, indicating a negative pulp vitality status. Intraoral periapical radiograph showed radiolucency extending to middle third of root on distal aspect of 22 and mild radiolucency on distal aspect of 12 (Figure 3). Furthermore, Cone beam computed tomography (CBCT) showed no such significant depression on palatal aspect of teeth but palatal bone loss was seen 6.83 mm and 7.17 mm on 12 and 22 respectively (Figure 3).



Figure 1: Palatal radicular groove with reference to 21 and 22.



Figure 2: Preoperative pocket probing depth of 7 mm on 12 and 6 mm on 22.

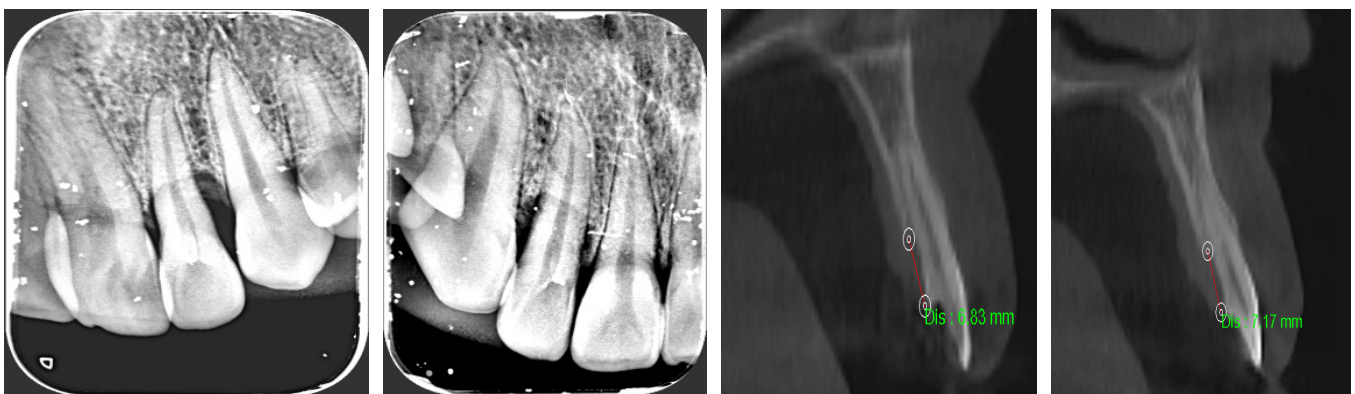


Figure 3: Preoperative periapical radiograph and cone-beam computed tomography



Figure 4: Flap reflection and debridement of the defect.

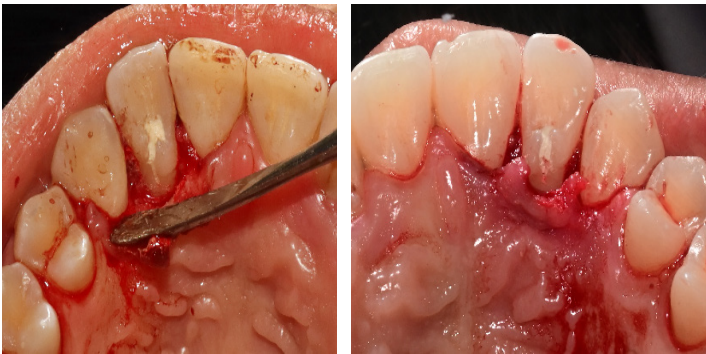


Figure 5: Biodentine was used to seal the groove.



Figure 6: Simple interrupted suturing with 6-0 prolene suture.

Patient was finally diagnosed with Localized periodontitis stage III Grade B with respect to 12 and 22 (Based on 2017 classification).⁶

Following treatment, in phase I therapy, oral prophylaxis was performed. After reevaluation on four weeks, surgical phase was planned, under nasopalatine nerve block 2% lidocaine with adrenaline in 1:2,00,000 concentration. To expose the apical extent of the groove, a full-thickness envelope flap was reflected on the palatal aspect, extending from the distal surfaces of teeth 11 and 21 to the mesial surfaces of teeth 13 and 23 in the first and second quadrants, respectively (Figure 4). Debridement and degranulation using Hu Friedy™ Gracey Curette number ½, ¾ was used (Figure 4). Shallow groove on clinical exposure extending

upto cervical third of the root was seen, classified as Type 1.⁵ Odontoplasty with diamond finishing bur was done and then sealed with Biodentine™ (Septodont, St. Maur-des-Fossés, France) (Figure 5). Finally, the palatal flap was repositioned and approximated using 6-0 Prolene sutures placed with an interrupted sling suturing technique. (Figure 6)

Post operative instructions given along with 0.2% chlorhexidine gluconate (CHX oral rinse—10 ml mouth wash) two times a day for 2 weeks. After ten days suture removal was done where gingival healing was satisfactory and uneventful. On follow up after a year periodontal probing depth reduced to 1 mm and 2 mm in 12 and 22 respectively (Figure 7). Likewise on radiograph, radiographic bone fill was observed.



Figure 7: Post-operative one year follow up with pocket probing depth of 1 mm and 2 mm in 12 and 22 respectively.

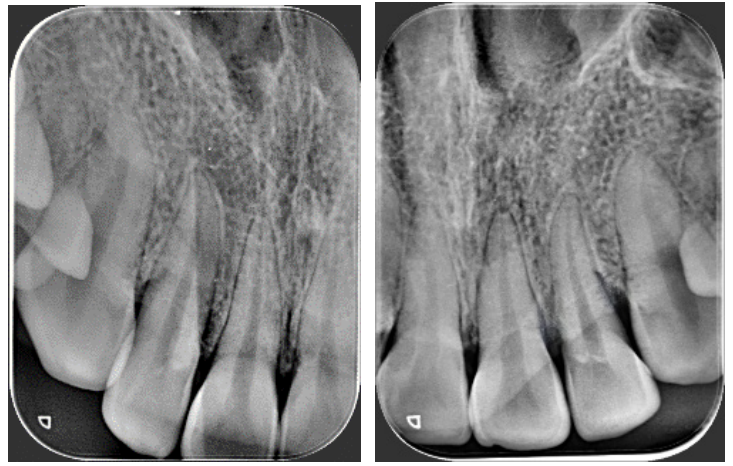


Figure 8: Post-operative one year follow up radiograph

DISCUSSION

PRG is one of the developmental anomalies that is difficult to diagnose because of its morphological resemblance with dens invaginatus, Tomes' root, and extra root variation.⁷ The groove provides a favorable site for plaque retention, contributing to periodontal destruction and eventual pulp necrosis.¹ Historically, teeth with PRG involving both endodontic and periodontal tissues were regarded as having a hopeless prognosis and were extracted.⁴ Despite of the complex condition related to PRG is initially manifested as normal pocket depth and normal state of surrounding tissue.⁴ If not detected while regular examination then PRG can lead to: (i) Periodontal disease (ii) A true endodontic disease (iii) Combined endo-perio problem.¹ That is why the prognosis of tooth depends on the location, extent, depth and accessibility of the groove.⁸

As the delay in knowing the causative agent of the disease the treatment modalities vary accordingly. With every treatment approach for teeth with PRG is based on similar strategies (i) eradicating microbials (ii) permanent sealing of the groove which is the source of communication (iii) periodontal regeneration or complete healing.⁴ So, based on the evidences in order to guide the treatment protocol on basis of extent and depth of PRG, comprehensive treatment protocol has been given.⁹

When the etiological factor underlying the clinical sequelae is PRG and the condition is diagnosed at an early stage, minimal intervention may be sufficient to achieve a favorable outcome. In 2003, Kerezoudis et al. recommended the treatment plan in shallow PRG cases that include (i) surgical removal of granulation tissue and irritants (ii) surgical exposure and flattening of the groove by grinding, with or without application of guided tissue regeneration techniques (iii) positioning a restoration in the groove.¹⁰ The present case was managed in accordance with this protocol.

In contrast, advanced cases where PRG is not diagnosed early, pulpal involvement may occur, necessitating endodontic therapy. Additional treatment modalities may be required, such as bone grafting procedures for advanced osseous defects, with alternatives including platelet-rich fibrin or other biologic materials.⁹ Later, reimplantation with minimal chances of survival or extraction might be the only treatment.

A variety of materials have been advocated for sealing the groove, including amalgam, glass ionomer cement, composite resin, and calcium silicate-based cements such as mineral trioxide aggregate and Biodentine®.⁹ Among these, Biodentine® is preferred for mild to moderate PRG cases due to its ease of manipulation, short setting

time, biocompatibility, and regenerative potential.⁷ Our case report confirmed that in early detection of PGG, treatment procedure is simplified and further destruction is halted, thereby limiting the treatment complication.

CONFLICT OF INTEREST

None



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