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Case Report

Palatoradicular groove and periodontal disease- A case report

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ABSTRACT

Palatoradicular groove is an important anatomic factor that presents accessibility problems and worsens the prognosis of periodontal disease. Palato-radicular groove is a rare developmental anomaly with prevalence rate of 2.8-8.5%. Most commonly affected tooth is the maxillary lateral incisor (93.8%).

Palatoradicular groove may present as a radiolucent para pulpal line, radiographically. Treatment of radicular groove presents a clinical challenge to the operator. Removal of local predisposing factor is of prime importance. This case report presents the management of the periodontal defect associated with palatoradicular groove incorporating periodontal flap surgery with bone graft and GTR.

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1. Introduction

Periodontitis is an inflammatory disease primarily induced by bacteria.¹ The periodontal disease classification by the American Academy of Periodontology (AAP) recognizes tooth anomaly as one of the contributing factor.² Morphological defects in dental structure such as irregularities in root anatomy, developmental abnormalities, subgingival restoration margins, marginal ridge discrepancies, food impaction, cervical enamel projections, cemental tear, malalignment, furcation involvement, open contacts and overhanging dental restorations play a significant role in plaque trap, maturation, mineralization and byproducts retention leading to onset of inflammatory process in the periodontal and pulp tissues. Inherent anatomic and morphologic features of the teeth present diagnostic, prognostic and therapeutic challenges for the operator.³

Considering, the clinical significance and rare occurrence of the palato-radicular groove, this paper presents a case of palato-radicular groove on maxillary lateral incisor with associated periodontal and pulpal involvement, managed with a combined treatment protocol.

2. Case Report

A 22 years old male patient presented with purulent discharge along the maxillary left lateral incisor which was present for the last one month. She did not give any history of trauma. The medical and family histories were non-contributory.

Examination revealed extrusion and grade II mobility of maxillary left lateral incisor which was not associated with dental caries. Examination on distopalatal aspect revealed a localized pocket of 10 mm depth with pus discharge from the pocket (Figure 1). On careful examination and exploration, the palatogingival groove was detected on the distopalatal aspect which was extending into the gingival sulcus. Patient's oral hygiene was fair.

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Fig. 1: Revealing palatogingival groove on distopalatal aspect of lateral incisor

The tooth was found to be non-vital and radiographic examination revealed a well-defined periapical radiolucency and advanced bony destruction on the distal aspect of 22 extending to the root apex (Figure 2).



Fig. 2: Pre-operativeradio graph

The lesion was diagnosed as localized severe periodontitis with pulp necrosis and associated with palatoradicular groove. A combined treatment protocol was formulated which consisted of a combination of endodontic therapy, radiculoplasty and periodontal regenerative

procedure. Phase I periodontal therapy along with root canal treatment of 22 was initiated. After completion of endodontic treatment, provisional splinting with composite resin was done to stabilize the tooth before regenerative procedure.

Three months after root canal treatment a full thickness mucoperiosteal flap was reflected to access the palatogingival groove, which was seen running half of the root length on distopalatal aspect (Figure 3). The groove was eliminated by radiculoplasty (Figure 4). The 2/3 wall intrabony defect, seen after debridement was grafted with a composite graft using a combination of bioactive glass and synthetic hydroxyapatite followed by resorbable membrane application (Figure 5). The flap was repositioned and stabilized with interrupted sutures and Coe-pak was placed. The patient was put on Cap Amoxicillin 500mg tid for 5 days, Tab Aceclofenac sodium 100mg bid – 3days and Chlorhexidine mouthwash 0.2% for 2 weeks. At six months follow- up, pocket probing depth reduced to 4 mm and recall radiograph showed bone fill in the defect site (Figure 6).



Fig. 3: Flap reflected, palatogingival groove seen running half of the root length



Fig. 4: Palatogingival groove was eliminated by radiculoplasty



Fig. 5: Bone Graft+ GTR resorbable membrane application



Fig. 6: Post-operative radiograph, 3 months

3. Discussion

The palatal groove is defined as “a developmental groove in root, that when present is usually found on the palatal aspect of the maxillary incisor teeth.”⁴ It could result in an endodontic, periodontal or combined lesion.⁵ The groove is considered as important contributing factor for severe localized periodontitis as it acts like a “funnel,” aiding plaque and calculus trap which destroys the sulcular epithelium and deeper part of the periodontium.⁶

Palato-radicular groove is a rare developmental anomaly with prevalence rate of 2.8-8.5% independent of the sex,

mostly present on the palatal surface of the maxillary lateral incisor. Most commonly affected tooth is the maxillary lateral incisor (93.8%).⁷

Palatogingival groove may present as a radiolucent para pulpal line, radiographically. Treatment of radicular groove presents a clinical challenge to the operator. Removal of local predisposing factor is of prime importance.

The prognosis of these teeth depends on location of the groove, the type of groove (shallow or deep, short or long) and accessibility of the defect.⁸ However, it is the meticulousness of periodontal treatment that ultimately determines the prognosis. Severe loss of periodontal attachment could result in a hopeless prognosis.⁶

Suggested treatment modalities includes, elimination of the groove by saucerization, restoration with Glass Ionomer cement, composite or MTA. Glass-ionomer cement provides tight seal and antibacterial property.⁹ The periodontal management of bony defect consists of open flap debridement, apically repositioned flap, orthodontic extrusion and various regenerative procedure with or without GTR membranes. The failure to re-establish periodontal attachment can lead to extraction of the tooth.¹⁰

This case was treated with periodontal flap surgery with bone graft and GTR. Splinting of mobile teeth is recommended to aid the initial periodontal healing.¹¹ Healing of the surgical site was good with reduction in pocket depth. It's reported that bioabsorbable membranes present improved soft-tissue healing as there is no need for a second surgical intervention for removal of the membrane. Due to these advantages, we used a resorbable collagen membrane that have the ability to prevent the apical migration of epithelium along the root surface during periodontal wound healing.¹² A bone graft was used to fill the defect under the membrane to reduce the dead space for tissue ingrowths, it also prevents the overlying membrane from possible collapse.¹³ A 7mm gain in attachment level was documented using bone graft and GTR membrane associated with palatoradicular groove.¹⁴

Periodontal defects associated with anatomical anomalies are truly interesting and challenging cases to manage, primarily because the patients are unaware of the disease progression and the defects are overlooked by dentists. This case report shows a successful treatment of deep periodontal defects associated with palatoradicular grooves in the maxillary lateral incisor.

4. Conclusion

Although periodontal complications due to palatoradicular groove are relatively rare, accurate diagnosis aided by appropriate diagnostic aids and elimination of inflammatory irritants and contributory factors leads to achieving long-term favorable results. Clinician's awareness of existence of such a peculiarity may help to avoid misdiagnosis and improper treatment of these patients.

5. Source of Funding

None.

6. Conflict of Interest

The authors declare no conflict of interest.

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