

Palatogingival groove – An endo-perio treatment approach – Case report

Dr LajjaJha¹, Dr Manish Shah², Dr Chintan Joshi³, Dr Sameer Sawaliya⁴
^{1,2,3,4}(Department of conservative and endodontics, Karnavati school of dentistry/Gujarat university, India)

Abstract: The palatal groove is a developmental anomaly, when it is present, causes an endodontic as well as a periodontal problem. These grooves often present a challenge to clinicians, to diagnose and to decide the treatment plan, as they require interdisciplinary treatment approach. This case report represents a treatment done in 24yr old male patient who had palatogingival groove in maxillary left lateral incisor. Surgical approach was done and observed satisfactory result after 6 months follow up.

Key Words: Dens Invaginatus, Mineral Trioxide Aggregate, Palatogingival Groove, Platelet Rich Fibrin.

I. Introduction

The definition of a palatal groove is “a developmental groove in root, that when present is usually found on the palatal aspect of the maxillary incisor teeth.” Palato-radicular groove is an uncommon developmental anomaly. Its prevalence rate is 2.8-8.5%. It is mostly present on the lingual surface of the maxillary lateral incisor. These grooves typically begin in the central fossa area of the incisors, extend over the cingulum and continue apically down the root surface [1].

The etiology of this defect is not fully understood. Some authors believe that the radicular groove is the mildest form of dens invaginatus and therefore, the pathogenic mechanism is relatively uncommon [2]. Whereas others believe that it is the incomplete attempt of a tooth to form another root [3]. A genetic mechanism [4] and racial link [5] has also been proposed. It is believed that there is minimal infolding of the enamel organ and epithelial sheath of Heartwig during odontogenesis [6].

There is some negative effect of palatogingival groove, as it is a plaque accumulation space. The groove may facilitate plaque growth by providing surface areas, in which plaque flora shelters and escapes the cleaning efforts and host defence [7]. In cases where the groove extends up to pulp chamber and the pulp becomes necrotic, in those cases the tooth requires endodontic treatment in addition to periodontal therapy. Therefore, ultimate prognosis of tooth depends on both endodontic and periodontic treatment. Suggested treatment modalities were curettage of the affected tissues, elimination of the groove by grinding (saucerization), or by sealing the defect with a variety of filling materials. If the groove extends beyond the middle-third of the root apex, surgical procedures are required, including these of barriers and intraosseous graft to correct the defect [8].

It is a case presentation of a Palatogingival Groove in a maxillary lateral incisor treated successfully with a combined endodontic, Mineral Trioxide Aggregate (MTA), and platelet-rich fibrin (PRF) membrane therapy. The rationale for this treatment modality is also discussed.

II. Case Report

A 24-year-old male patient had a complaint of intermittent and dull pain at the palatal side of the left maxillary lateral incisor came to Department of Endodontics. During the clinical examination, the left maxillary lateral incisor had an intact crown without caries or fracture. The vitality test was negative. Tender on percussion was positive. The tooth was grade II mobile which is 1 to 2mm of tooth movement. Periodontal probing disclosed a periodontal pocket (9 mm) at the mesiopalatal line angle of the tooth and concomitantly, a Palatogingival groove which extended into the gingival sulcus [Fig 1]. Facially the gingival sulcus had 8 mm probing depth. Oral hygiene was satisfactory. An occlusal radiograph revealed a large periapical lesion with a bony defect extending beyond the middle third of the root. Gutta-percha tracing into the sinus tract in relation to lateral incisor and periodontal pocket revealed a communication with the periapical area. Based on the tests and the radiographic findings, the diagnosis was necrotic pulp, suppurative periradicular periodontitis and localized periodontitis secondary to the palatal groove on tooth [Fig 2].

First oral prophylaxis was performed. Access opening was performed in endodontically treated tooth so for retreatment GP cone was removed with the help of 25 no H file and disinfecting the area with 2% chlorhexidine digluconate (vconcept, vishal, India). Working length was determined by using electronic apex locator (ProPex II, Dentsply Maillefer Company, USA) and radiographically with 15 no K-file. The root canal was cleaned and shaped by K-files with ethylenediaminetetraacetic acid (EDTA) (RC Help, Prime Den, India) using crown down technique. The root canal was copiously irrigated with 2% sodium hypochlorite

(Novo Dental Product, India). Access cavity was temporized with calcium hydroxide and temporary cement (Orasil G). Patient was recalled after 1 week; the tooth was asymptomatic. Root canal was irrigated again with normal saline and dried using paper points. Before obturation, master points were seated to test their suitability to canal and radiograph was taken. The canal was obturated with selected master gutta-percha cone and AH-Plus sealer (DentsplyMaillefer Company, USA). The coronal gutta-percha cones were sheared off using heated instrument, and vertical compaction was done using the heated pluggers at the canal orifices [Fig 3].

During the periodontal phase of the therapy, complete extraoral and intraoral mouth disinfection was done with betadine and local anesthesia was administered (xylocaine 2% with epinephrine 1:80,000). A surgical flap was raised from the palatal aspect and labial aspect, and the palatogingival groove was isolated to its most apical extent [Fig 4]. Thorough scaling and root planning was performed over the groove to remove the bacteria that might have colonized there. The diseased granulation tissue was curetted out with Gracey curette number 1/2 and 5/6; (Hu-Friedy Manufacturing Co, Chicago, IL). A chemical conditioning of the groove was performed and Mineral Trioxide Aggregate (ProRoot MTA, DentsplyMaillefer Company, USA) was applied into the defect [Fig 5]. The area was kept isolated of blood and tissue fluids during the setting of the cement by using local hemostatic gelatin sponge.

2.1 Preparation of PRF membrane

A 12 ml sample of whole blood was drawn intravenously from the patient's right antecubital vein and centrifuged (REMI Model R-8c with 12 × 15 ml swing out head) under 3,000 rpm for 10 min to obtain the Platelet Rich Fibrin which was jelly-like in consistency. Platelet Rich Fibrin clot started to release its serum (Platelet Rich Fibrin -clot exudates) and was ready for compression into the membrane and the flaps were secured with 3-0 black braided silk sutures [Fig 6].

Following surgery, the patient was placed on doxycycline 100 mg, with instructions to take two capsules immediately, then one capsule every day for 14 days. In addition, a 0.12% chlorhexidine gluconate rinse was prescribed and ibuprofen was given for discomfort. The patient was asymptomatic postoperatively and sutures were removed after 7 days. The patient was recalled after 6 months. There was both a clinical and radiographic improvement. Clinically, there was a reduction in the pocket depth of 5 mm in 6 months [Fig 7].

III. Discussion

Most common site for Palatogingival groove is maxillary lateral incisors and have been implicated as an initiating factor in localized gingivitis and periodontitis. Loss of periodontal attachment associated with these grooves, some of which may extend to the apical third of the root could result in a hopeless prognosis for tooth retention. Prognosis of this defect depends on location, depth and extension of groove and destruction of periodontal attachment. The groove which is shallow and located only in the crown structure can be corrected by odontoplasty and periodontal treatment, if groove extends deep and pulpal destruction is present then the treatment is complex. The purpose of the treatment is to complete removal of inflammatory tissue, elimination of groove and healthy periodontal health.

Several materials are used to seal the palatogingival groove like Glass ionomer cement, Amalgam, MTA, Composite, Biodentin etc. In Choukroun's PRF (platelet-rich fibrin) blood is collected without any anticoagulant and immediately centrifuged. A natural coagulation process then occurs and allows for the easy collection of a leukocyte- and platelet-rich fibrin (L-PRF) clot, without the need for any biochemical modification of the blood, that is, no anticoagulants. Platelet rich fibrin is a complex biomaterial with a specific biology. It is organized as a dense fibrin scaffold, with a high number of leukocytes concentrated in one part of the clot, with a specific slow release of growth factors (GFs) (such as transforming growth factor type beta 1 (TGF-β1), platelet-derived growth factor (PDGF)-AB, vascular endothelium growth factor (VEGF)) and glycoproteins (such as thrombospondin-1) during at least 7 days [9].

This case report involved a maxillary lateral incisor with a deep palatal groove and associated periodontal and pulpal involvement. As a result of the extensive nature of this groove on the lingual surface, tooth had a localized periodontal disease requiring a combined endodontic-periodontic treatment approach. The platelet rich fibrin membrane acts by releasing high-concentration growth factors to the wound site, thereby stimulating healing and new bone formation. The use of platelet rich fibrin membrane is a simple method that requires minimal cost and reduces the need for specialized grafting material. Because it is a completely autologous product, the risk of disease transmission and graft rejection is negated. MTA that has high mechanical properties with excellent biocompatibility, as well as a bioactive behaviour was used to seal [8].

IV. Conclusion

This case report presented the successful treatment of a pulpal-periodontal combined lesion on a maxillary lateral incisor associated with a palatoradicular groove. The key to achieve long-term favourable results in this particular type of developmental anomaly is accurate diagnosis and elimination of inflammatory

irritants and contributory factors. Clinician's awareness about existence of such a peculiarity may help to avoid misdiagnosis and improper treatment of these patients.

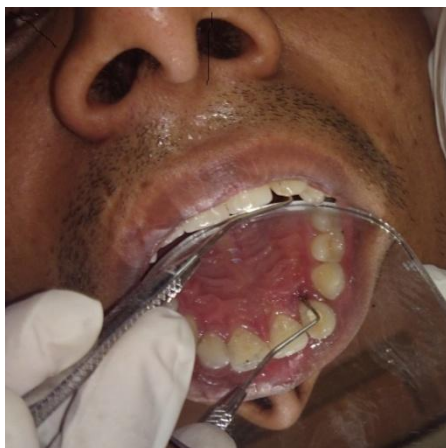


Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7

References

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