Case Report

“Palatogingival Groove” - An Endodontic Enigma

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Abstract

Maxillary incisors are very susceptible to developmental anomalies that can lead to periodontal and / or endodontic problems. One such developmental anomaly is the palatogingival groove which often predisposes to pulpal necrosis and the establishment of combined periodontal - endodontic lesions.

This report describes a case of palatogingival groove in an upper right lateral incisor with periodontal complications. The management included a combination of endodontic therapy and periodontal regenerative techniques.

Key Words: Palatogingival groove, Maxillary lateral incisor, Pulpal necrosis, Periodontal regeneration.

Introduction

The anomalous tooth development of crown and root accounts for substantial number of pulp death in upper anterior region. In such cases of malformations bacterial invasion and hence bacterial infection of the pulp is often the cause of pulpal inflammation or tooth loss¹.

It is uncommon why the different malformations occur although there is evidence that most of the anomalous tooth developments are genetically determined¹.
A mild dental anomaly occurring in the region of maxillary incisors is the radicular palatal groove. This malformation is also described in the dental literature as the distolingual groove, a radicular lingual group or palato gingival groove. As the name implies this malformation is actually a groove which starts near the cingulam of the tooth and run towards the cement enamel junction in an apical direction at various depths along the root surface\(^2,5\).

The exact etiology of this defect is not fully understood. Some clinicians believe that radicular group presents the mildest form of dens invaginatus. Other investigator claims that this malformation results from an attempt of the body to form another root on the affected tooth\(^2\).

The majority of the radicular grooves are seen at palatal aspect of the maxillary lateral incisor and rarely in the posterior teeth. Due to its unusual location the palatal groove has the potential to harbor bacteria and debris leading to local inflammatory reaction. This anomaly often presents a diagnostic and treatment planning challenges due to the combined endodontic - periodontal lesion\(^3\). We herewith report a case of maxillary lateral incisor with palato gingival groove associated with pulpal necrosis and localized periodontitis. The clinical feature and the management of the above said anomaly are discussed.

**Case Report:**

A 25 years old male patient reported to the Department of Conservative Dentistry and Endodontics, Government Dental College, Bangalore with a chief complaint of pus discharge from the labial gingival in the maxillary right lateral incisor region since 4 months. There was no history of trauma and the medical history was non contributory.
Clinical examination revealed a sinus on the labial gingival surface associated with maxillary right lateral incisor (Fig.1).

![Fig 1: Sinus with pus discharge in labial gingiva w.r.t 12](image)

On periodontal probing, a palatal groove was detected associated with pocket of 10 mm in depth (Fig.2).

![Fig 2: Prominent palatal groove in 12](image)

The tooth had no significant mobility. Thermal and Electrical Pulp Vitality Tests gave negative response. Periapical radiograph showed circumscribed radiolucency measuring 5 mm x 7 mm in diameter at the apex the tooth and radiolucent line running adjacent to the root canal on the distal aspect (Fig.3).

![Fig 3: Radiograph of 12 showing palatogingival groove](image)

The diagnosis of combined endodontic - periodontal lesion associated with palato gingival groove was made based on clinical and radiographic finding. Our treatment plan consisted of non surgical root canal therapy followed by surgical management of periodontal defect.

The tooth was isolated with rubber dam, access cavity prepared and pulp extirpation done using barbed broaches. The canal was debrided with 3% sodium hypochlorite (Vensons, India). Working length was determined following which the canal was
cleaned and shaped using hybrid instrumentation with gates glidden drills and NITI hand files (Dentsply, Maillefer, Switzerland). Copious irrigation with 3% sodium hypochlorite was done at every step of instrumentation. 17% EDTA was used to remove the smear layer. Canal was dried using paper points following which calcium hydroxide paste was placed as an intra canal medicament and access was sealed with IRM. At the subsequent visit obturation was completed with cold lateral compaction of gutta-percha and zinc oxide eugenol sealer (Fig.4).

Fig 4: Radiograph of 12 after root canal therapy

The access cavity was restored with type II Glass Ionomer cement (GC Corporation, Tokyo, Japan). Patient was recalled after one month. At the follow-up visit the Sinus tract was still present and there was pus discharge from the palatal gingival adjacent to the groove. After consultation with the periodontist and exploratory surgery was planned. 2% Lidocaine hydrochloride with 1:200000 epinephrine (Astra-Zeneca Pharma, India) was administered followed by reflection of palatal full thickness flap that revealed fenestration of the cortical plate on the palatal aspect. The bony defect and granulation tissue was debrided. Odontoplasty was performed on the root surface to eliminate the groove (Fig.5).

Fig 5: Saucerization of the groove
Then the defect was sealed with GIC type-II (Fig. 6).

Fig 6: Restoration of the Defect with type II Glass Ionomer Cement

The flap was replaced and sutured. Patient was prescribed antibiotics, analgesics and a mouth wash containing 0.2% chlorexidine gluconate. At the recall visit post surgical healing was satisfactory and Sinus tract had healed.

DISCUSSION

Dysplastic radicular dentin with numerous clefts are often considered to be an important contributing factor for the development of localized periodontitis as it favours the accumulation and proliferation of bacterial plaque deep into the periodontium.

The pulp is also affected by bacteria which are situated in the radicular groove. Bacteria and their products may enter the pulp through the accessory foramina and lateral canals situated along the floor or side walls of the groove. Another route of bacterial invasion into the pulp is via the exposed dentinal tubules on the side of the groove where surface resorption as a result of inflammatory process may occur.

Different studies have revealed a prevalence rate for palatal groove of about 2.8 to 8.5%, the most prevalent being the maxillary lateral incisor.

The treatment of palatal groove presents a clinical challenge to the operator. The variability in size and shape of this anomaly coupled with bacterial invasion may affect both the periodontium and the pulp. Hence, conventional endodontic treatment alone will not be effective because the bacterial etiology is residing extra radicular as a self sustaining lesion.
The reported long term prognosis of the therapy appears to be related to the apical extension of the groove. Shallow grooves may often be treated successfully while a deep groove presents complex endodontic periodontal problems with a poor prognosis. It is important to note that, it is the ability to adequately treat the periodontal defect that ultimately determines prognosis of these teeth. In the present case combined endodontic and periodontal treatment was performed to eliminate the irritants causing inflammatory process. Radiculoplasty was performed to eliminate the groove which often harbors bacteria and debris leading to local inflammatory reaction.

Here Glass Ionomer type II Cement has been used to seal the defect as it has chemical adhesion to the tooth structure providing good sealing ability. Clinical and histological studies have shown that there is an epithelial and connective tissue adherence to the Glass Ionomer Cement during the healing process, similar to the formation of long junctional epithelium.

However, long term follow-up is required for further clinical evaluation of the lesion.

**CONCLUSIONS**

* Deep radicular grooves can predispose to pulp necrosis and the establishment of combined endodontic periodontal problems.

* Evaluation of clinical signs and appropriate diagnostic tests are of paramount importance in order to prevent deterioration of attachment of apparatus.

* Combined endodontic - advanced periodontal regeneration treatment modalities can help us to salvage the problems associated with this developmental anomaly.
REFERENCES


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