PALATORADICULAR GROOVE –THE SILENT VILLAIN!

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Abstract

Palatoradicular groove (PRG) has been defined as a developmental, anomalous groove usually found on the palatal aspect of maxillary central and lateral incisors. This groove provides a nidus for accumulation of plaque &calculus. Since these grooves are inaccessible to routine oral hygiene practices they progress to periodontitis and if untreated may result in periapical pathosis too. If not diagnosed early may need multidisciplinary approach for treatment.
This paper discusses about young female patient who reported for routine dental examination, on thorough clinical examination she was diagnosed to have palatoradicular groove in relation to maxillary left lateral incisor. A timely diagnosis was made and treated surgically with odontoplasty and restoration of the defect. On re-examination after 6 months patient had good oral hygiene, no signs of disease progression &the tooth remained to be vital. We emphasise the importance of early diagnosis and prompt treatment for the patient.
Keywords: Palatoradicular groove, Lateral incisor, Timely diagnosis.

Introduction

Periodontitis is defined as the inflammatory disease of tooth supporting structures caused by microorganisms or by group of specific microorganisms resulting in progressive destruction of the periodontal ligament and alveolar bone with pocket formation or recession or both. According to the American Academy of Periodontology (AAP) International workshop for classification held during the year 1999, the developmental and acquired deformities and conditions, were grouped together as an entity that could lead to periodontal destruction. [1]

The palatoradicular groove is one such rare root anomaly, which is also known as radicular groove, palatogingival groove, and distolingual groove with a prevalence of 2.8-3%. It is defined as a developmental, anomalous groove found on the palatal aspect of maxillary central and lateral incisors, extending from the cingulum apically on to the root surface. This is formed by an infolding of the enamel organ and the epithelial sheath of Hertwig during odontogenesis.

The localization promotes the accumulation of plaque and calculus along the groove. As there is no epithelial closure, it is possible for microbes to settle into the groove. Depending on the morphology of the PRG, localized periodontitis may develop& if untreated at this stage will lead to periapical pathosis. [2]

Case Report

A 31 year old female patient reported to the Department of Periodontology, for routine dental examination. A comprehensive periodontal examination was completed, including intraoral & extraoral radiographic evaluations. The patient was systemically healthy.

Intra oral examination revealed presence of supra & sub gingival plaque in relation to maxillary left lateral incisor that showed bleeding on probing with a pocket depth of 6 mm. Patient experienced a mild sensitivity in relation 22 occasionally. On careful clinical examination presence of palatoradicular groove was diagnosed in midpalatal region of 22. (Figure 1)
Bleeding on probing was present in relation to 22. (Figure 2)

Figure 1: - Pre-operative view showing periodontal pocket of probing depth of 6 mm.

Figure 2: - Pre-operative view showing bleeding on probing

Intra oral periapical radiograph revealed no evidence of periapical pathosis. Vitality test was performed and tooth showed immediate response & thus considered to be vital. Based on clinical & radiographic findings, it was diagnosed as localized periodontitis in relation to 22 with palatoradicular groove. The patient received a session of oral prophylaxis, including scaling and root planning, and proper oral hygiene instructions. On re-evaluation after a month of phase I therapy pocket was still persistent in relation 22. Thus phase II therapy was planned for the

patient, which included localized flap surgery & restoration of the PRG. Under local anesthesia sulcular incisions & interdental incisions were made around 21, 22 and 23 and a full thickness flap was elevated in relation to the palatal aspect of 21, 22 and 23. (Figure 3)

Figure 3: - Reflection of flap and debridement with PRG in 22 – Palatal View.

Upon removal of granulation tissue palatoradicular groove was visualized & found extending till one third of root length. After instrumentation of root surface & adequate moisture control it was decided to seal the PRG. Odontoplasty was done in the coronal aspect& radicular portion of the groove was sealed with GIC (Figure 4).

Figure 4: - Odontoplasty done and groove scaled with Type II Glass Ionomer Cement.

The flap was positioned back stabilized with simple interrupted sutures of 3-0 black silk. The patient was prescribed Amoxicillin 500 mg thrice daily for 5 days, Paracetomol 500 mg thrice daily for 3 days, and 0.2% CHX mouthwash 2 times a day for 4 weeks. Suture removal was done after a week. Healing of the wound was uneventful. Postoperative three months follow up showed considerable healing with reduction in probing depth to 3mm (Figure 5 & 6) and revealed satisfactory gingival adaptation to the sealed groove as well as maintenance of periodontal health & vitality of the tooth (Figure 7).

Figure 5: - Post-operative palatal view – after three months

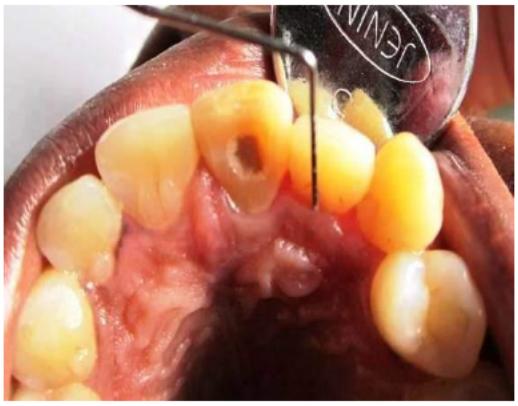

Figure 6: - Post-operative palatal view – after three months with reduction in probing depth to 3 mm

Figure 7: - Post-operative Radiograph reveals no evidence of periapical pathology in 22.

Discussion

The presence of a morphological defect called a palatogingival groove is considered to be an important contributing factor to the development of localized chronic periodontitis, for it favors the accumulation and proliferation of bacterial plaque deep into the periodontium. This anomaly affects maxillary incisors, especially lateral incisors. [3]

Withers *et al* in 1981 observed that palatogingival grooves are found on 2.3% of maxillary incisors (4.4% maxillary laterals and 0.28%of maxillary centrals). Everett in 1972 observed that palatogingival grooves found on 2.8% of lateral incisors. The prevalence and different morphological conditions of the palatogingival groove were evaluated by Albaricci MF et *al* [3] where in 376 maxillary lateral and central incisors were examined. The teeth were evaluated by a single examiner, considering their presence, localization, origin of formation, extension and depth in millimeters, using a magnifying glass, a precision pachymeter and a millimeter-scaled periodontal probe. Results showed a higher prevalence in lateral incisors with higher prevalence in proximal localization, origination from a central force (57.1%) and predominance in oblique trajectory (62.8%). Of all these teeth, only 8.6% of palatogingival grooves reached the root apex, while 97.1% were considered as flat (<1mm).

Depending on the morphology of the PRG, localized periodontitis may develop, accompanied by pathosis. Periodontal pocket depths of more than 5 mm and increased dental mobility &if untreated, may result in periapical pathosis. The clinical relevance of the PRG is the danger of microbial colonization and a subsequent endodontic-periodontal lesion[4, 5].

The reason for microbial colonization is the missing epithelial and desmodontal tissues and the presence of irregular calcified tooth tissue. The depth and the extension of the groove do not seem to be important. The existence of a groove with a connection to the gingival sulcus facilitates the microbial colonization on irregular hard tissue structures. The frequent existence of accessory canals and the partially unclosed groove allow microbial penetration and the retrograde infection of the pulp.

The prognosis for the preservation of the tooth depends on an early diagnosis of the malformation, adequate treatment and prophylaxis. An incorrect or delayed diagnosis decreases the prognosis and could result in the extraction of the tooth. Several different procedures have been proposed for successful correction of the PRG. In most cases odontoplasty was carried out in combination with regenerative therapy. Other reported treatment procedures are careful root planing and cleaning, [5] filling of the groove with amalgam, [6,7] or calcium sulphate[8] or GIC, [9] and intentional replantation after root planning and the insertion of Emdogain.[10] In some cases, the tooth was extracted due to its high mobility or in cases of bruxism.

In our case as the tooth was vital and had no bony defects associated with it. Localized flap surgery & restoration of defect with GIC was done. A 6 month follow up revealed no signs of disease progression. In this case if the diagnosis was missed at an early stage the tooth would have progressed for non-vitality and a combined approach by endodontist and periodontist would be needed.

This paper emphasizes the need of careful diagnosis of lateral incisors by both Periodontist and Endodontist. A cautious examination of the patient may avoid multiple specialists treating the same lesion!

Conclusion

Though the incidence of the PRG is 2.8-3%, careful evaluation of maxillary incisors should be carried out.Early diagnosis and treatment at that stage would help the patient to a greater extent in preserving the vitality of teeth and preserving the bone support. Thus, as a dentist let us be aware of the silent PRG and recognize them early. Preservation of the existing is more important than replacing what has been lost.

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