International Journal of Modern Developments in Engineering and Science
Volume 1, Issue 3, March 2022
https://www.ijmdes.com | ISSN (Online): 2583-3138

Dental Grooves – Killing the Silent Killer

Pallavi Soni*
Dental Surgeon, Department of Dental, DG Health Services, Dehradun, India

***Abstract*: Dental grooves are not an unusual occurrence but are more commonly seen with maxillary lateral incisors. These grooves if present on palatal surface is commonly referred as Palatoradicular groove (PRG) and if on labial surface as Labiocervical vertical groove (LCVG). These grooves extend upto varying depths are usually asymptomatic but if compromised periodontally can compromise aesthetic zone if left undetected and/or untreated. The following case series discuss 3 cases of PRG and LCVG and different therapeutic approaches with post-surgical aesthetic results in mind.**

***Keywords*: PRG, LCVG, Periodontally, Aesthetic.**

1. Introduction

Dental grooves are usually seen with maxillary lateral incisors. These grooves can extend upto various depth on the root surface on either facial or palatal side. Withers et al1reported 8.5% incidence whereas Kogan 2 reported 5.6% incidence of palatal grooves with lateral incisors. Nevertheless, the difference amongst investigations it is safe to assume that presence of such grooves provides additional surface for bacterial attachments and thus pose a risk to periodontal as well as endodontic health of involved teeth.

Periodontal diseases are bacterial infections with complex etiology, specific bacteria's act as primary etiologic agents producing a biofilm. This biofilm which is usually present supragingivally if left undisturbed may migrate subgingivally and irregularities like restorative margins or root anatomy can enhance subgingival plaque accumulation.

Since periodontitis is an infectious disease it is treated with antibiotics such as Tetracycline, Augmentin and Metronidazole. Local antimicrobial mouthwash such as Chlorhexidine or Povidone-Iodine are also prescribed to reduce subgingival pathogens.

Periodontists prefer to use different types of bone graft to augment bony defects, in this case series we discuss detection of dental grooves in aesthetic zone and different therapeutic approach depending upon the depth of grooves and associated periodontal loss.

2. Case-1

A 25-year-old female patient reported to the Department of Periodontology with a chief complaint of left upper lateral incisor. On clinical examination, a localized gingival inflammation was present with soft edematous tissue with the accumulation of plaque and calculus. Periodontal examination depicts a deep tubular periodontal pocket depth of 10 mm on the left lateral incisor palatally. On radiographic examination, a tear-shaped radiolucency was present with localized bone loss (Figure 1).

The patient does not have any caries and history of trauma with 22. It shows an extensive bone loss and deep periodontal probing depth. This extensive amount of bone loss along with the above findings at the age of 25 years gives a suspicion of palatogingival groove, which on careful examination was discovered on the lateral incisor (Figure 2).

Investigations: IOPA w.r.t 21, 22
CBC, BT and CT

Fig. 1. Tear shaped radiolucency

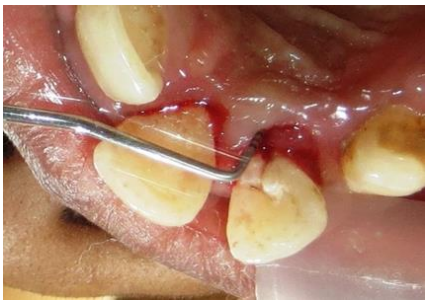

Fig. 2. Palatogingival groove associated with pocket

Diagnosis: Perio-endo lesion w.r.t 22
Treatment plan:
Aim of the treatment:
To correct the osseous defect along with correction of palatogingival groove.
Method:
Phase one therapy was completed. Endodontic treatment of the said tooth was completed. Complete extraoral and intraoral

*Corresponding author: pallavisoni1301@gmail.com

mouth disinfection was done with betadine, local anesthesia was administered (xylocaine 2% with epinephrine 1:80,000). A crevicular incision was given along with the vertical incision in respect to 22 and the full-thickness flap was raised. This revealed a through and through defect apically with only a fraction of buccal plate attached cervically (Figure 3).

Fig. 3. Poor Prognosis of 22

This defect was curetted and cleaned and a clear groove was visible after flap reflection; but keeping in mind the long-term questionable prognosis in this case it was decided to go ahead with extraction and socket grafting using PRF The flap was replaced and sutures followed by a periodontal pack.

3. Case-2

A 25-year-old female patient reported to the Department of Periodontology with a chief complaint of pain with left upper lateral incisor and suppuration with same. On clinical examination, a localized gingival inflammation was present with soft edematous tissue with the accumulation of plaque and calculus. Periodontal examination depicts a deep tubular periodontal pocket depth of 10 mm on the left lateral incisor (Figure 4) palatally. On radiographic examination, a tear-shaped radiolucency was present with localized bone loss (Figure 5) and Root canal therapy of the same 2 years back.

Fig. 4. Periodontal pocket with 22

Fig. 5. Pre-operative IOPA

Investigations: IOPA w.r.t 21, 22
CBC, BT and CT

Diagnosis: Perio-endodontic lesion w.r.t 22

Treatment plan:

Initial periodontal treatment consisting of oral hygiene instructions and localized scaling and rootplaning on left maxillary lateral incisor was completed and then endodontic therapy – root canal treatment was completed in left maxillary lateral incisor. But the deep periodontal pocket and intraoral sinus was still present. As a result, surgical intervention of left maxillary lateral incisor was recommended to eradicate this underlying problem.

After the full thickness mucoperiosteal flap was reflected labially and palatally under local anaesthesia, through and through perforation of buccal and palatal cortical plate was seen in periapical region (Figure 6). Hence, Apicectomy was done followed by chorion membrane plavement palatally, defect was filled using PRF with DFDBA (Figure 7), followed by chorion membrane (Figure 8), labially groove was sealed using RM-GIC

The flaps were approximated and sutured (Figure 9). The sutures were removed after a week. Healing was uneventful. The patient was placed on a 3-month periodontal maintenance recall programme.

Fig. 6. Perforation of the both plates

Fig. 7. Defect filled with PRF & DFDBA

Fig. 8. Chorion membrane placed

Fig. 9. Flaps approximated and sutured

4. Case-3

A 28-year-old male patient reported to the department with chief complaint of redness of gingival and forwardly placed upper front teeth. On clinical examination severe generalized gingival inflammation was noticed with abundance of plaque and supragingival and subgingival calculus with recession in some anteriors and crowding of same.

Investigations: IOPA w.r.t 11, 12, 21 and 22
CBC, BT and CT

Diagnosis: Chronic generalized severe periodontitis

Treatment plan:

The patient was subjected to complete scaling and thorough root planning. The patient was given oral hygiene instructions. The patient was reviewed after 2 weeks. Clinical symptoms subsided, but deep pockets were still present and hence subsequent periodontal surgeries were carried out to eradicate the underlying problem. The procedure was explained to the patient and the consent was obtained for the same. Routine blood investigations were done.

After assuring surgical asepsis, a pre-procedural rinse with 0.2% chlorhexidine gluconate was accomplished. After administration of local anesthetic (2% lignocaine with 1:80000 adrenalin), the papilla preservation flap (Takei et al.) was adopted since there was sufficient space between the maxillary central incisors. A full-thickness flap was reflected on both facial and palatal surfaces. The exposed root surfaces were thoroughly scaled and root planed and bone defect carefully curetted. LCVG noted on #21 (Figure 10), terminated in the cervical third of root surface was sealed with resin modified glass ionomer cement (Fuji II; GC Corporation, Tokyo, Japan) (Figure 11). The flaps were approximated and sutured. The sutures were removed after a week. Healing was uneventful.

The patient was placed on a 3-month periodontal maintenance recall programme.

Fig. 10. Labial groove up to cervical 3rd

Fig. 11. Groove sealed with RMGIC

5. Discussion

Palatogingival groove or radicular lingual groove (RLG) is a developmental anomaly due to developmental infoldings of the inner enamel epithelium and Hertwig's epithelial root sheath (HERS). The presence of RLG does not always indicate the development of pathology. Usually, the epithelial attachment is intact above the groove. If this is breached, a self-containing pocket develops along the length of the groove or by gingival irritation secondary to microbial plaque retention. Goon et al. 3 suggested a classification, which represents two types of RLGs, simple and complex. The simple RLGs do not communicate with the pulp and represents a partial unfolding of HERS, while complex RLGs communicate directly with the pulp and groove that extend the length of the root. In rare cases, the groove may lead to minor accessory root, which may contain a root canal.

Diverse occurrence rates for PGG have been reported. The investigation by Everett et al.4 was the first large survey of the prevalence of PGG. They reported a prevalence of less than 2% with 0.5% of PGG extending into the apical area in their survey of 625 extracted maxillary lateral incisors.

Meanwhile, other researchers have reported higher occurrence rates. Storrer et al.5 reported a prevalence rate of 9.58% in a survey of 73 extracted maxillary lateral incisors. Al-Rasheed et al.6 reported 10.3% prevalence of the PGG, with 6.5% and 3.8% for coronal and apical grooves, respectively, from clinical examinations of 552 maxillary lateral incisors in 276 Saudi adults.

PGG can be classified by its location as distal, mesial, or central patterns. If the groove is located proximally, bacterial plaque accumulation can occur more rapidly and cause greater difficulty in removal, resulting in destruction of periodontal tissues and formation of localized periodontal lesions.

The first two cases presented in this series are of complex type i.e connecting to pulp and running across the root length.

In case 1 PRG lead to extensive periodontal loss palatally and also labially except the thin buccal plate intact cervically which made detection of true pocket length difficult clinically. RVG shows periapical bone loss. These factors lead us to go for a conservative approach with 22 i.e., grafting with GTR. But as flap was reflected with very poor periodontal support w.r.t 22 long term prognosis was questionable; hence it was decided to attempt for socket preservation with the same. Here complex PRG lead to loss of anterior tooth in esthetic zone which could have been averted if detected cautiously and early.

In case 2 PRG lead to extensive periodontal loss periapically

and lead to thru and thru perforation of buccal and palatal cortical plate in periapical region with previous history of RCT. Hence Re-RCT was conducted, apicectomy was done followed by chorion membrane palatally, defect was filled using PRF with DFDBA, followed by chorion membrane labially, groove was sealed using RM-GIC, flap was then retracted and sutures placed. Post-op 2 years there is no recurrence of lesion. Periodontal complications due to PRGs are relatively rare, but in this case, it led to recurrence of lesion.

In case 3 LCVG was seen on 21, LCVG starts on the cervical enamel and extends to the radicular surface. These grooves can be classified into mild, moderate, and complex based on its depth and extent. It has been pointed out that defect may vary from a simple, shallow developmental groove, to a complete lack of closure of calcified tissues, allowing for a direct soft tissue connection between the pulp and the periodontium. These grooves are deep initially after root formation and become shallower with age. The presence of LCVG may exacerbate some clinical aberrations, such as esthetic deficiency of the gingival marginal contour, accumulation of plaque and, consequently, gingival pocket with bone loss, as well as failure in endodontic and periodontal treatments. Kozlovsky et al., 7 describe a 25-year-old female in which a periodontal lesion with vertical bone loss was directly related to the labial groove on a maxillary central incisor. We have also observed an intrabony defect directly related to LCVG on #21.

6. Conclusion

Tooth Conservation is the core criteria of current dental practice. Practitioners should be aware of various tooth defects, their significance in etiopathogenesis of periodontal disease. A proper diagnosis of lesions affected by both periodontal and pulpal disease is essential for the successful treatment of these complex lesions. It is important to recognize the role of deep palatoradicular groove/labiocervical vertical groove and should be addressed with satisfactory post treatment aesthetic results.

References

[1] Withers JA, Brunswold MA, Killoy WJ, Rahe AJ. “The relationship of palate-gingival grooves to localized periodontal disease.” J Periodontol 1981;52:41-44.

[2] Kogon S. “The prevalence, location and conformation of palate-radicular grooves in maxillary incisors.” J Periodontol 1986;57:231-234.

[3] Goon WW, Carpenter WM, Brace NM, Ahlfeld RJ. “Complex facial radicular groove in a maxillary lateral incisor.” J Endodontics 1991; 17:244-248.

[4] Everett FG, Kramer GM. “The distolingual groove in maxillary lateral incisors: A periodontal hazard.” J Periodontol. 1972;43:352–361.

[5] Storrer CM, Sanchez PL, Romito GA, Pustiglioni FE. “Morphometric study of length and grooves of maxillary lateral incisor roots.” Arch Oral Biol. 2006;51:649–654.

[6] Al-Rasheed A. “Relationship between palato-radicular groove and periodontal health in maxillary lateral incisors.” Pak Oral Dent J. 2011;31:154–157.

[7] Kozlovsky A, Tal H, Yechezkiely N, Mozes O. “Facial radicular groove in a maxillary central incisor. A case report.” J Periodontol. 1988;59:615–617.