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Research Article

INTERDISCIPLINARY APPROACH IN THE MANAGEMENT OF PALATATOGINGIVAL GROOVE - A CASE SERIES

Sangeetha S., Prakash P.S.G., Divyashree P*., Victor D.J., Vijayant Singh and Vaishnavi Ratheesh S

Department of Periodontics, SRM Dental College, Chennai

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ABSTRACT

This report represents three cases of maxillary lateral incisor with palatogingival groove associated with severe periodontal destruction. All the three cases were managed by an interdisciplinary approach involving endodontic and surgical periodontal management. The rationale for the management of the pocket with different Surgical procedures were explained briefly in the article.

INTRODUCTION

Maxillary lateral incisor is a midget tooth that testifies with too many anomalies in the oral cavity. The most common one of such anomaly is the Palatogingival groove; This is also interchangeably known as Distolingual groove, Radicular Lingual groove, Palatoradicular groove, Radicular groove or Cingulo-radicular groove (Hyun - Il Kim *et al*, 2007). Hou *et al* (1993) reported the incidence of palatogingival groove to be 2.8% to 18%. The formation of the Palatogingival groove could be attributed to either in folding of the enamel organ and hertwig's epithelial root sheath (Lee *et al*, 1968) or a futile attempt in the formation of an additional root (Simon *et al*, 1971). Ennes *et al* (2004), suggested a genetic mechanism and a racial link in the frequency of its occurence. Palatogingival groove, present on the palatal aspect of the lateral incisor starts as an atypical tract from the central fossa, crosses over the cingulum and extends apically on the root surface for varying distances and depth (Everett *et al*, 1972 & Robison *et al*, 1988). The appropriate diagnosis is essential to prevent the complications that arises due to the concealed tract. This anomaly can lead to the occurrence of periodontal pocket and progressive bone loss. In some cases this groove is connected to the pulp through the accessory canals thus establishing an Endodontic-Periodontic communication (Gao *et al*, 1989).

This article discusses 3 cases identified with palatogingival groove and describes the successful management with combined restorative and regenerative techniques.

Case management

Case 1

A 35 year old male patient reported with the chief complaint of pain and pus discharge in relation to his upper front teeth region for the past one year. Patient had a noncontributory medical history. Clinical examination revealed Palatogingival groove on 22 (Left maxillary lateral incisor) associated with reddish, soft, edematous gingiva and pus discharge on the palatal aspect. The probing depth was 10 mm on the palatal aspect and grade I mobility was evident. Radiographic examination revealed bone loss till the coronal third of the root. Regenerative periodontal surgery was planned. Phase I Periodontal therapy was performed to achieve a healthy periodontium. Surgical phase consisted of full thickness flap elevation in relation to 22, that revealed a circumferential osseous defect. The defect was debrided completely and grafted with Demineralized xenogenic bone matrix

Corresponding author:* **Divyashree P
Department of Periodontics, SRM Dental College, Chennai

(Osseograft). Ten milliliter of intravenous blood was collected from the patient and centrifuged at 2500- 3000 rpm for 13 minutes to obtain Platelet rich fibrin (PRF) membrane. The membrane was placed over the graft. The Palatogingival groove was saucerized and restored with Glass Ionomer cement (GIC). The flap was approximated and sutured with 4-0 Vicryl (Ethicon). Periodontal dressing was placed over the surgical site. Chlorhexidine 0.2% twice daily was prescribed for two weeks during the postoperative period and appropriate post operative instructions was given. (Figure 1)

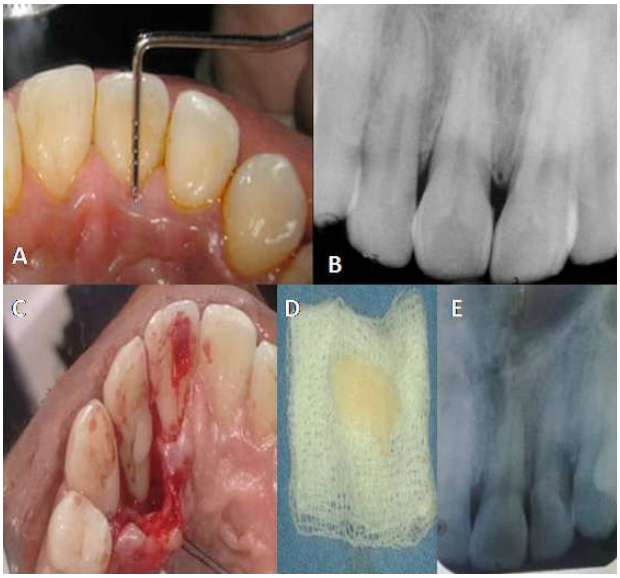

Figure 1 A: Pre operative clinical view; B: Pre operative IOPA; C: Intra operative view of the circumferential defect; D: PRF obtained; E: 6 months post operative IOPA.

Case 2

A 29 year old male patient reported with the chief complaint of swelling in upper front teeth region which was associated with pus discharge for the past 3 months. Clinical examination revealed Palatogingival groove on 12 (Right maxillary lateral incisor) associated with reddish, soft, edematous gingiva and Pus discharge with sinus opening. The probing depth was 12 mm on the palatal aspect with grade I mobility.

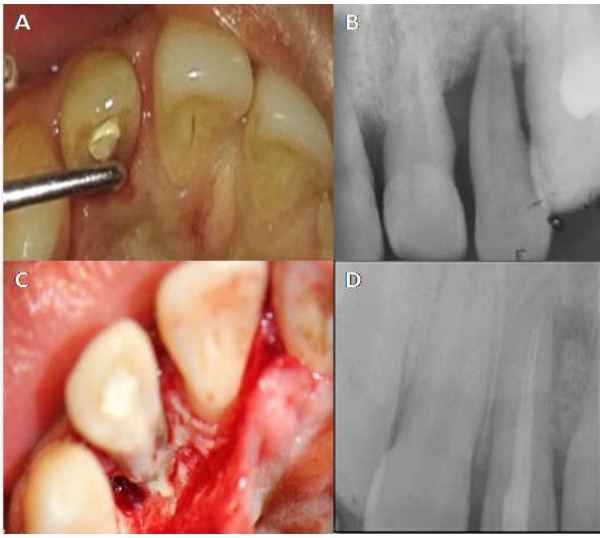

Figure 2 A: Pre operative clinical view; B: Pre operative IOPA; C: Intra operative view, saucerization of the groove and restored with GIC; D: 6 months post operative IOPA.

Radiographic examination revealed bone loss till the apical third of the root. Regenerative periodontal surgery was planned. Phase I Periodontal therapy and endodontic management was done. Surgical management consisted of flap surgery with placement of bone graft and PRF in the defect. (Figure 2)

Case 3

A 20 year old female patient reported with the complaint of mobile tooth in her right upper front teeth region for the past 1 year. Dental history revealed that the patient had undergone orthodontic management and root canal treatment in 12 prior to 6 months. Clinical examination revealed an edematous gingiva in relation to (right maxillary lateral incisor) 12 with a pocket formation of probing depth about 9mm and Grade I mobility. A prominent Palatogingival groove was associated with the lateral incisor. Radiographic examination revealed a radiopaque filling in the pulp chamber and the root canal of 12 indicative of root canal management; Bone loss was evident till the apical third on the mesial side of 12 and till the middle third on the distal side. Phase I therapy consisted of root surface debridement together with splinting of the upper anteriors (13-23) on the labial aspect. Surgical management with simplified papilla preservation flap was planned in upper anterior region. Oblique incisions were placed across the papilla, starting from the gingival margin at the buccal-line angle of the involved tooth to reach the mid-interdental portion of the papilla under the contact point of the adjacent tooth. The incision is continued intrasulcularly on the buccal aspects of the teeth from 13-22. After the elevation of a full thickness buccal flap, the remaining tissues of the papilla were carefully dissected from the neighbouring teeth and the underlying bone crest. Then the interdental papillary tissue was gently elevated along with the palatal flap to fully expose the interdental defect. Following the defect debridement and root planing, demineralized xenogenic bone matrix (Osseograft) and PRF membrane was placed. The flap was approximated and sutured with vertical internal mattress sutures using 4-0 Vicryl (Ethicon). Periodontal dressing was placed over the surgical site. Chlorhexidine 0.2% twice daily was prescribed for two weeks during the

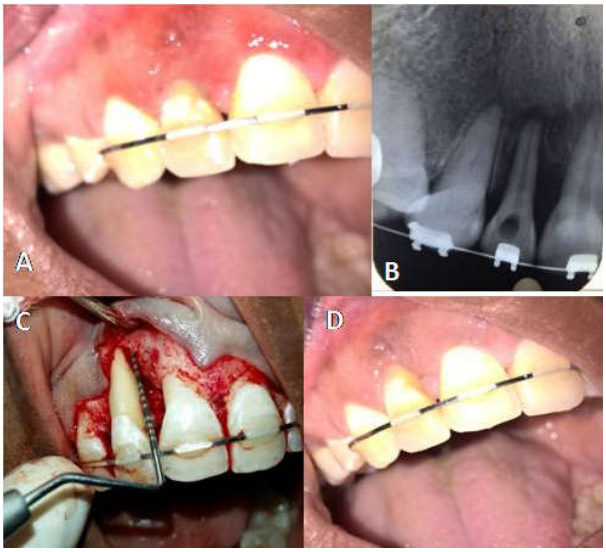

Figure 3 A: Pre operative clinical view; B: Pre operative IOPA; C: Intra operative view; D: Post operative clinical view.

postoperative period and appropriate post operative instructions was given. (Figure 3)

DISCUSSION

The palatogingival groove anamoly is most commonly encountered in the maxillary incisors, predominantly on the lateral incisors with a rate of affliction (4.4-5.6%) when compared to central incisors (0.28-3.4%) (Kogon *et al*, 1986 & Withers *et al*, 1981). More than 50% of the palatogingival grooves are seen to extend beyond the cemento-enamel junction onto the root surface. Amongst these grooves traversing the root, 43% have shown to extend apically less than 5 mm in distance, 47% between 6 - 10 mm and 10% have shown to extend beyond 10 mm (Kogon *et al*, 1986). The palatogingival groove acts as a niche for plaque retention and makes it slightly difficult or even impossible for the patient to clean. This paves the pathway for the development of Endo-Perio lesion by communication between the pulpal system and the periodontium through the accessory canals. The palatogingival grooves are classified as simple and complicated (Goon *et al*, 1991). Simple grooves are less likely to cause severe destruction as they do not communicate with the pulp and represent only a minor infolding of the Hertwig's epithelial root sheath. On the other hand, complicated grooves communicate with the pulp cavity either laterally or apically. They are more likely to result in complex Endo-Perio lesions and its management requires an interdisciplinary approach.

Two of our cases required endodontic management as the pulp was found to be non-vital. In terms of periodontal management, for case 1 and case 2 access flap surgery was performed to allow the complete visualization and debridement of the root surface of the affected teeth. This access also facilitated to augment the defect with demineralized bone matrix along with PRF. In the third case, due to the involvement of the adjacent teeth in maxillary anterior region which demanded an esthetic appeal, Simplified papilla preservation flap (SPPF) (Cortellini *et al* in 1999) was rendered suitable. SPPF technique helps in the protection of blood clot by ensuring primary intention healing of the approximated flaps. This facilitates better reduction of probing depths and gain in the Clinical attachment level. As bone grafting is the main stay treatment for periodontal regeneration, Demineralized bone matrix (Osseograft) was used in the defects for all the cases along with PRF as the membrane. PRF is a second generation platelet concentrate introduced by Choukroun *et al* in 2001. It is enriched with platelets, growth factors (PDGF, TGF, etc,.) and cytokines that have shown positive outcomes in periodontal regenerative and plastic surgery (Castro AB *et al*, 2017). PRF when used as membrane is shown to have a space-making effect, facilitating cell events that are favorable for periodontal regeneration (Preeja *et al*, 2014). The gradual release of growth factors and cytokines from the PRF aids in the wound healing of the periodontal defects along with the graft material.

Palatogingival groove was prepared and restored with glass ionomer cement as it has an added advantage of antibacterial effect, chemical adhesion to the tooth structure, adequate sealing ability (Maldonado *et al*, 1978 & Vermeersch *et al*, 2005) and promotion of epithelial and connective tissue attachment (Dragoo *et al*, 1997). All of the cases were followed up for a period of over 6 months. Oral hygiene instructions were reinforced at each visit and the patients were under active periodontal maintenance care. The healing following treatment was uneventful and bone fill was evident in the postoperative radiographs. The appropriate diagnosis of the palatogingival groove that is usually undetected is necessary to overcome the endo-perio complications that it could possibly lead to due to plaque retention.

CONCLUSION

The field of periodontics and restorative dentistry are dependent on each other. A holistic periodontal and endodontic management of endo-perio lesions is essential for an optimal result. A prompt plaque control program is essential for healing of the lesions as well as to prevent recurrence of these types of lesions.

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