Treatment of Palatogingival groove associated with bone loss- case series

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Abstract

Palatogingival groove is a developmental anomaly which may cause periodontal destruction and if the groove is wide and deep endodontic involvement can also occur. In this case series the periodontal pockets of 7-10 mm pocket depths were present associated with Palatogingival Grooves. These cases were treated with scaling, root planning in the first visit and periodontal flap surgery along with bone grafting, odontoplasty and sealing the groove with Glass Ionomer cement Type II done in the next visit.

Keywords: Palatogingival groove, Periodontitis, Prognosis, Prevalence, Localised bone loss.

Introduction

Palatogingival groove (PGG) term was coined by Lee *et al*[1] which is a developmental anatomic aberration affecting external and internal morphology of the tooth. This is also known as radicular lingual groove, distolingual groove, syndesmo coronoradicular groove and radicular groove.[2,3]

Etiopathogenesis of PGG is due to infolding of enamel organ and Hertwig's epithelial root sheath before the calcification phase. Embryologically, it is correlated to a mild form of dens invaginatus[4] but the exact etiology is still unclear.[5]

Prevalence rate varies from 1.01% to 8.5%[6] with the maximum incidence rate in Chinese population of 18%.[7] The maxillary lateral incisor (LI) is most commonly (93.8%) affected tooth in the dentition[8] with only 0.75% bilateral occurrence rate.

Clinically, it is identified as a V-shaped notch with altered or interrupted Cementoenamel junction (CEJ) which commences in the cingulum region and proceeds apically parallel to the long axis of the tooth.[9]

Due to superimposition of PGG over the pulp canal space it is very difficult to identify it through radiographs, however, multiple radiographic exposures with different horizontal projections can identify a palatogingival groove which can be seen as a radiolucent para pulpal line.[10]

This area is difficult to clean and acts as a plaque trap which destroys the sulcular epithelium and later deeper parts of the periodontium resulting in the formation of a severe localized periodontal defect.[11]

The prognosis of the affected teeth determined by the adequate treatment of the periodontal defect.Proposed treatment modalities were curettage of the affected tissues, exclusion of the groove by smoothening and grinding (saucerization), if the groove is very big which cannot be eliminated by grinding then it can be sealed with different filling materials. Surgical procedures are the treatment of choice if the groove extends beyond the middle-third of the root apex.[6]

Case 1

An 18 year old female patient reported to Department of Periodontology, M.M. College of Dental Sciences & Research, Mullana, Ambala, Haryana with the chief complaint of pain in the upper front teeth region of the mouth. On clinical examination it was noted that there were periodontal pockets with 8 mm depth on the mesial and 7 mm depth on the palatal aspect of tooth number 12 (Fig. 1, 2). The gingiva was inflamed, soft and oedematous with bleeding on probing was present. The tooth was vital with Grade II mobility.

Fig. 1: Mesial probing showing 8mm periodontal probing depth

Fig. 2: Palatal probing showing 7mm periodontal probing depth

On radiographic examination it was observed that there was vertical bone loss on the mesial and the distal aspect of the tooth (Fig. 3).

Fig. 3: Radiograph showing vertical bone loss around 12

On day 1 scaling and root planing were completed and the patient was recalled after 1 week. After 1 week there was reduction in inflammation and gingiva was firm. Kirkland flap was raised after giving local anaesthesia to the patient (Fig. 4). Then the debridement was done to remove the granulation tissue with the help of Gracey Curettes number 1/2 and 5/6. Groove was smoothened with the help of air rotor and was checked for any irregularity (Fig. 5). Bone graft, **OSTEOGEN®** bioactive resorbable calcium apatite graft was placed in the area of vertical bone defect (Fig. 6). Flap was placed to its original position and then direct loop interrupted sutures were given (Fig. 7). Periodontal pack was placed on the treated area (Fig. 8).

Fig. 4: Picture showing bone loss on palatal aspect of 12

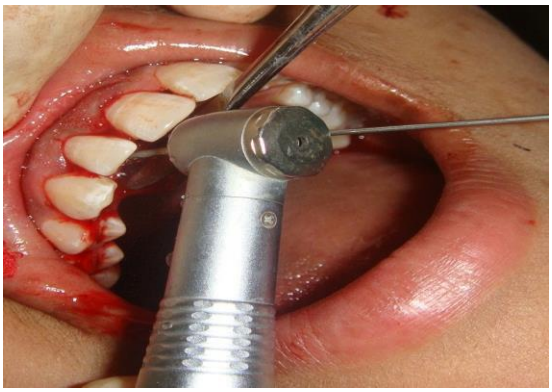

Fig. 5: Odontoplasy done with the help of airrotor

Fig. 6: Bone graft placed with respect to 12

Fig. 7: Sutures given after placement of flap to its original position

Fig. 8: Periodontal pack placed with respect to 12

Sutures and periodontal pack was removed one week postoperatively. On diagnosing one month postoperatively there was 1mm reduction of periodontal pocket depth (Fig. 9) and there was reduction in Mobility from Grade II to Grade I.

Fig. 9: One month postoperative picture showing reduction in periodontal pocket depth

Case 2

A 26 year old female patient reported to the Department of Periodontology with the chief complaint of movement and rotation of 21. On clinical examination periodontal pocket of 10 mm depth was found on the mesial aspect of 21 and 8 mm pocket depth was on palatal aspect (Fig. 10, 11). There was palatogingival groove on the palatal aspect of 21. On radiographic examination there was vertical bone loss with respect to 21(Fig. 12). The tooth was vital with Grade II mobility.

Fig. 10: 10mm periodontal pocket depth on mesial side of 21

Fig. 11: 8 mm periodontal pocket depth on palatal side of 21

Fig. 12: Radiograph showing vertical bone loss on mesial aspect of 21

In the first visit all records of the patient were noted and scaling and root planning was done. In the next visit modified flap operation was performed. After raising the flap the granulation tissue was debrided with the help of Gracey Curettes number 1/2 and 5/6 (Fig. 13). Bone graft was placed with respect to 21 and the

groove was filled with GIC Type 2 (Fig. 14). Periodontal flap was placed to its original position. Sutures and periodontal pack was given (Fig. 15, 16).

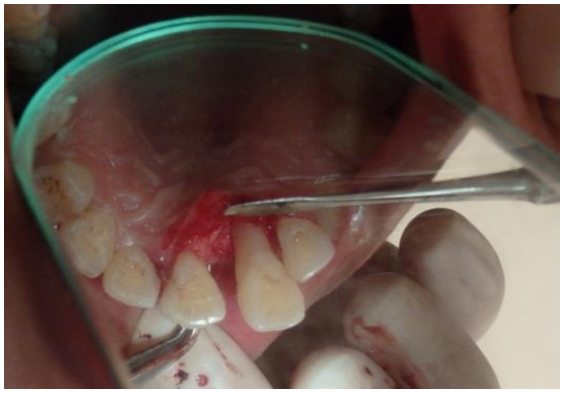

Fig. 13: Flap reflection showing bone loss on palatal aspect of 21

Fig. 14: Bone graft placed in vertical bone loss area

Fig. 15: Sutures given after placement of flap to its original site

Fig. 16: Periodontal pack placed

On diagnosing one month postoperatively there was 2 mm reduction of periodontal pocket depth with no tooth mobility (Fig. 17).

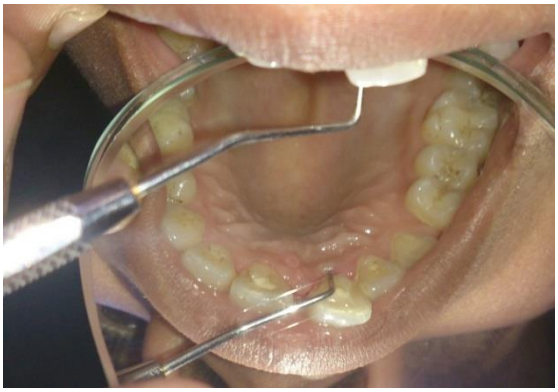

Fig. 17: 1 month postoperative picture showing reduction in periodontal pocket depth

Discussion

Localized periodontitis can result due to accumulation and proliferation of bacterial plaque deep into the periodontium.[12] It is not necessary that all grooved teeth will present a breakdown of the epithelial attachment, but this is considered as a risk factor. Whithers et al.[8] described that the palato-gingival groove is associated with a "poor periodontal health." According to different studies the prevalence rate for palatal groove of about 2.8 to 8.5%, the most commonly affecting the maxillary lateral incisors.[13] Palatogingival grooves may act as contributing factor in the pathogenesis of periodontal and endodontic lesions. In the present cases there was vertical bone loss and the teeth were vital. Odontoplasty can be used to treat the groove and the groove can be filled using Glass Ionomer Cement as explained by Ballal NV et al.[14] If there is endodontic involvement of the teeth then endodontic treatment of the teeth has to be completed first before the start of periodontal treatment. Prognosis of the treatment depends on the apical extension of the groove with shallow grooves can be treated successfully while a deep groove with a poor prognosis.[13]

Glass Ionomer type II Cement has been used to seal the defect due to its good sealing ability. Hans MJ et al have shown that there is an epithelial and connective tissue adherence to the Glass Ionomer Cement during the healing process which is similar to the formation of long junctional epithelium.[15] However it is essential to seal the Palatogingival groove to eliminate the pathways of communication between the pulp and the periodontium.[16,17] Due to complexity the diagnosis of a palatogingival groove is very difficult because the defect may manifest itself with symptoms of true periodontal disease or may be expressed as a true endodontic problem or combination of both. Differential diagnosis may include a cracked crown or a vertical root fracture.

Conclusion

Careful periodontal probing should be done because deep isolated periodontal pockets can be recognised associated with Palatogingival Grooves. Detection of the palatal radicular grooves is very critical, due to diagnostic complexity the problems may arise if not properly diagnosed and treated.

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