

SURGICAL MANAGEMENT OF GINGIVAL RECESSION ASSOCIATED WITH LABIAL DEVELOPMENTAL GROOVE – A CASE REPORT

Dr. Prashant Bhusari*, Dr. Amiyavardhan Jain**, Dr. Nitin Agrawal**,
Dr. Shivam Upadhyay **.

Abstract:

Periodontal health reflects a balance between harmful and protective elements in the gingival marginal area. The total plaque mass, specific periodontopathogens, the tooth morphology and local environmental factors may challenge this balance. Developmental variations and morphological abnormalities such as cervical enamel projections, enamel pearls and developmental- gingival grooves, in the maxillary incisors have also been described as factors contributing to the localized periodontal disease process. This case report presents management of gingival recession associated with developmental labial groove on the maxillary right central incisor; using semilunar coronally positioned flap and saucerization (odontoplasty) of the groove.

Key words: Developmental groove, gingival recession, odontoplasty, pulpal- periodontal lesion, Radiculoplasty.

Introduction: Bacterial plaque is the primary etiological factor in the initiation and progression of periodontal disease. Developmental variations and morphological abnormalities, such as cervical enamel projections, enamel pearls and palato-gingival grooves (PGG) in the maxillary incisors have also been described as factors contributing to the localized periodontal disease process.¹ Everett and Kramer² reported data from the study of extracted maxillary lateral incisors, showing the frequency of dento-lingual groove to be small but significant causal factor in the attachment loss and periodontal disease causation. Pecora & da Cruz Filho³ reported radicular grooves to be present in 3.9% of their subjects, primarily on the lingual surface of the maxillary lateral incisors (3%). Less than 1% of maxillary central incisors showed radicular grooves on the buccal and/or lingual surfaces. The exact etiology of these developmental grooves is unknown. Similar to an invagination, it seems to be a peculiarity of tooth development accompanied by a further anomaly. Black⁴ was the first to describe the PGG as a malformation during embryo

development in 1908. According to recent study,⁵ PGG may be caused by genetic changes. These developmental grooves can vary in depth and complexity. Mild ones terminate at the CEJ where as moderate grooves continue apically along the root surface. The most complex forms are deeply invaginated defects that separate an accessory root from the main root trunk.⁶

This paper reports a case of isolated gingival recession associated with one of such a developmental labial groove which is successfully treated by surgical management and radiculoplasty.

Case report:

A female patient of age 28 reported to Department of Periodontology, Modern Dental College & Research Center, Indore, Madhya Pradesh, India. Her chief complaint was sensitivity with respect to 11 (upper right central incisor) and gradual increase in the length of the same tooth which she found to be aesthetically unacceptable. There was no history of trauma or previous periodontal surgery and no medical history of relevance.

*Professor, ** P.G.Student. Dept of Periodontics, Modern dental college,

Clinical Examination: Careful soft tissue examination revealed healthy alveolar mucosa without any presence of intraoral sinus with pus discharge in relation to labial and / or palatal mucosa. Periodontal examination revealed the gingiva on the labial aspect of 11 was slightly inflamed, oedematous & bleeding on probing. There was absence of pus discharge, tooth mobility but the presence of 4 mm periodontal pocket. The gingival margin was 2 mm apical to CEJ with 6 mm clinical attachment loss. On careful manual probing with William's graduated periodontal probe the tooth indicated concavity starting from the cervical 1/3rd of the crown crossing CEJ & extending to the root in the form of a groove. Staining of the groove with Gentian-violet solution confirmed the exact course of the groove. (Fig 1)



Figure 1: Preoperative view of gingival recession associated with labial developmental groove.



Figure 2: Semilunar incision placed

Endodontic examination revealed no pain on percussion and thermal & pulp testing showed normal responses. Thus endodontic treatment was not indicated. On radiographic examination no periapical or periodontal pathology was identified. The labial developmental groove was also not traceable due to the radio-opacity of the tooth.

Diagnosis: Radicular developmental groove on the labial aspect of 11 with gingival recession and chronic localized periodontitis.

Treatment: The clinical & radiological findings supported the diagnosis. it was decided to treat the condition by periodontal plastic surgery and radiculoplasty. Treatment started with the initial preparation including plaque control program, oral hygiene instructions, elimination of habits related to the etiology of the recession, meticulous

scaling & root planing. The patient was instructed to perform a non-traumatic brushing technique using a soft tooth brush. One week after the initial preparation the patient underwent surgery. The recession was treated by Semilunar Coronally Positioned Flap (SCPF) as described by Tarnow.⁷ Following local anaesthesia a semilunar incision was made parallel to the curvature of receded gingival margin and ending 2 to 3 mm short of the tip of interdental papillae (Fig 2).

A split thickness dissection was performed coronally from the incision which was connected to intrasulcular incision. The overlying flap just collapsed coronally covering the denuded root. When the flap was reflected with the periosteal elevator; the groove was noticed extending just beyond gingival margin around 2 mm deep (Fig 3).



Figure 3: Reflection of the split-thickness flap showing extent & the course of stained groove



Figure 4: Radiculoplasty (Saucerization)

Since the groove was shallow (<1mm), saucerization of groove was done by high speed diamond bur with continuous stream of water (Fig 4). Next the flap was held in new position for a few minutes with the moist gauze. Flap was stabilized with sling suture and periodontal pack was then placed (Fig 5). Patient was discharged with postoperative instructions & medications including oral analgesics (ibuprofen 400mg every 8 hours as necessary) and 0.2 % chlorhexidine gluconate (every 12 hours for 14 days). Patient recalled after 24 hours for review. Periodontal pack was removed after 2 weeks. Post-operative photograph was taken to show the final surgical outcome at three month. (Fig 6)



Figure 5: Flap stabilized with sling suture



Figure 6: Postoperative view after 90 days

Results: Postoperative examination revealed that the healing was satisfactory and patient was asymptomatic with 3 months of follow up. The recession was completely covered with the elimination of developmental groove & disappearance of sensitivity (Fig 6). The patient was highly satisfied with the regain of aesthetically acceptable smile. Going by the above treatment protocol, a single tooth can now be diagnosed correctly and treated successfully with a predictable prognosis.

Discussion: The PGG & Labial groove are developmental anomaly of variable extent & depth that may or may not involve a communication between the pulp cavity and the periodontal tissue. Gher and Vernino⁸ stated that depth & extent of the groove is an important factor in the prognosis of the tooth. Grooves are deepest immediately after the root formation and become shallower with age due to increased cementum deposition.

This fissure like channel is a locus of plaque and calculus accumulation, that makes it difficult or sometimes impossible for the patient or even the professional to clean properly and acts as a secondary etiological factor encouraging the development of periodontitis adjacent to the groove.⁹ The pulp is also affected by bacteria which are situated in radicular groove. Bacteria & 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.¹⁰ In the present case since the groove was very

shallow, pulpal involvement was not evidenced even by thermal & pulp- testing. Thus endodontic treatment was not indicated.

The treatment of developmental groove presents a clinical challenge. Several different procedures have been proposed for successful correction of these grooves. In most cases odontoplasty was carried out in combination with the regenerative therapy. Other reported treatment procedures are careful root planing and cleaning,¹¹ filling of the groove with amalgam¹² or calcium sulphate¹³ and intentional replantation after root planning and the insertion of Emdogain.¹⁴ In some cases the tooth was extracted due to its high mobility or in cases of bruxism.¹⁵ In the present case because of the presence of shallow groove, saucerization (radiculoplasty) was the treatment of choice without any regenerative and/or restorative procedure. Gingival recession was treated by Semilunar Coronally Positioned flap (SCPF) as described by Tarnow.⁷ SCPF was the treatment of choice as the recession was shallow (3mm) & the procedure is very simple to perform plus the predictability provides 2 to 3 mm of root coverage.

The reported long term prognosis of the therapy appears to be related to the apical extension of the groove. It is important to note that it is the ability to adequately treat the periodontal defect that ultimately determine prognosis of these teeth. However long term follow-up is required for further clinical evaluation of these lesions.

Conclusion: The primary goal of periodontal therapy is to produce an environment that is conducive to oral health. Local etiological factor like developmental groove may prevent the removal of subgingival plaque and may even contribute to destruction of the periodontal tissue. Deep radicular groove can predispose to pulp necrosis and the establishment of combined endo-periodontal problems. Combined endodontic – advanced periodontal

regeneration treatment modalities can help us to salvage the problems associated with this developmental anomaly.

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Corresponding Author:

Dr. Prashant Bhusari
Professor, Department of
Periodontics, Modern Dental College
& Research Centre, Indore
Ph- +919589867820,
Email: pbhu2000use@yahoo.com