

**MANAGEMENT OF PALATOGINGIVAL GROOVE WITH A COMBINED ENDODONTIC PERIODONTAL LESION IN THE MAXILLARY RIGHT LATERAL INCISOR: A CASE REPORT WITH A TWO-YEAR FOLLOW-UP**

Dr. Seema Yadav*	MDS, Senior Professor (SAG), Department of Conservative Dentistry and Endodontics, Maulana Azad Institute of Dental Sciences, New Delhi, India *Corresponding Author
Dr. Farrukh Faraz	MDS, Professor, Department of Periodontology, Maulana Azad Institute of Dental Sciences, New Delhi, India
Dr. Rega Kumar	MDS, Senior Resident, Department of Conservative Dentistry and Endodontics, Maulana Azad Institute of Dental Sciences, New Delhi, India

ABSTRACT Palatogingival groove (PGG) is a developmental defect results from an alteration in the growth of the inner enamel epithelium and the Hertwig's root sheath. The most frequently affected teeth by this malformation are maxillary lateral incisors. PGG may predisposes either to necrosis of pulp or to periodontal pocket and bone loss, or can cause a combined endodontic periodontal lesion. This case report presents the successful management of PGG with a combined lesion in the maxillary right lateral incisor. A 26-year-old male patient came with a chief complaint of small swelling in relation to the upper front teeth region. Clinical examination revealed buccal intraoral swelling with palatal gingival inflammation and a deep periodontal pocket with respect to tooth #12. The tooth was non responsive to pulp sensibility test. The periapical radiograph showed a para-pulpal line with pear-shaped periapical radiolucency, suggestive of PGG. The case represented pulpal necrosis with asymptomatic periapical periodontitis along with localized periodontitis with PGG. The management included endodontic treatment followed by surgical periodontal therapy with groove sealing using glass ionomer cement. On a two-year follow-up, the patient was asymptomatic, and healing of the periapical lesion was apparent on the periapical radiograph.

KEYWORDS : Palatogingival groove, Combined endodontic and periodontal lesion, Pear shaped radiolucency, Para pulpal line.

INTRODUCTION

The palatogingival groove (PGG) is also known by different terms as radicular lingual groove, palatoradicular groove, or distolingual groove.^[1] PGG can arise either from developmental invagination of the inner enamel epithelium and Hertwig's epithelial root sheath or from discontinued effort in the formation of an additional root, or from alteration of genetic mechanisms and racial linkage.^[2]

The groove is found on the lingual surface of the maxillary lateral incisor, can be seen on the central fossa either in the mid, mesial, or distal aspect, and extends in the apical direction onto the root surface.^[3] The groove depth may range from a shallow groove of 1-2 mm involving cementum to a deep groove of 5 mm near the pulp.

The groove depth can be clinically significant as it provides an area for bacterial plaque accumulation. This can result in gingival irritation, inflammation, and attachment loss and increase the risk of periodontal pocket formation and localised bony defects along its length.^[4]

The groove can potentially affect the pulp of the involved tooth. The groove can act as a channel for bacteria and other irritants to penetrate the tooth structure, leading to inflammation and infection of the pulp tissue. This can result in symptoms such as pain, sensitivity, and swelling, which can ultimately lead to the necrosis of the pulp tissue if left untreated.

The groove may lead to combined endodontic and periodontal lesions, which can be challenging clinical situations to manage. Treatment of this condition typically requires a multidisciplinary approach and has a guarded prognosis. Regular monitoring and maintenance are important to ensure long-term success and prevent the recurrence of the lesion.

This case report describes the successful management of a combined endodontic and periodontal lesion associated with a PGG in the maxillary right lateral incisor, with a follow-up of 2 years.

Case Report

A 26-year-old male patient reported to the department of conservative dentistry and endodontics with a chief complaint of a small swelling in the right upper front tooth region. There was no relevant medical and dental history. Patient did not recall any trauma in the maxillary anterior region.

Upon clinical examination, a buccal intraoral swelling was observed just above the maxillary right lateral incisor (tooth #12), along with

palatal gingival inflammation. The tooth appeared normal without any caries or discoloration. Further investigation exposed a palatal groove arising from the cingulum of the crown. Probing on the palatal aspect revealed a periodontal pocket with a depth of 6 mm [Fig 1A, 1B, 1C]. The periapical radiograph showed a radiolucent line adjacent to the main canal and a pear-shaped radiolucency in relation to tooth #12 [Fig 2A]. There was no response in relation to tooth #12 on electric pulp testing. Considering the history, clinical evaluation, and radiographic findings, a provisional diagnosis of pulpal necrosis, asymptomatic periradicular periodontitis with localized periodontitis secondary to PGG was made.

The initial treatment involved removing the infected pulp tissue by performing root canal therapy on tooth #12. After obtaining the informed content, access preparation was made, and the working length was determined. Cleaning and shaping of the canal were carried out with a NiTi rotary system (Protaper Gold, Dentsply Maillefer, Switzerland). The canal was irrigated with 3 ml of 2.5% sodium hypochlorite and 3 ml of 17% ethylenediaminetetraacetic acid (EDTA) solution. After the canal preparation, a calcium hydroxide medicament (Apexcal, Ivoclar Vivadent, Amherst, NY, USA) was placed for 7 days and the access was sealed with an intermediate restorative material.

After one week, the mucosal swelling had subsided. The tooth was re-entered, debrided, and obturated with the lateral condensation technique with gutta-percha and sealapex sealer (SybronEndo, Orange, CA, USA). The access cavity was restored with composite resin (Te Econom Plus, Ivoclar Vivadent, Amherst, NY, USA) [Fig 2B].

A full thickness mucoperiosteal surgical flap was reflected from the buccal and palatal aspects of the root after root canal therapy, allowing access to the buccal bone defect and PGG on the palatal aspect of the root. [Fig 3A, 3B]. After the completion of granulation tissue removal, and local disinfection was performed with antimicrobial photodynamic treatment (Helbio Bredent Medical, Senden, Germany) [Fig 3C].

The groove was extended up to the middle third of the palatal wall of the root. The groove was minimally widened using a straight fissure bur, debrided, and then 10% polyacrylic acid was applied as a cavity conditioner for 20 seconds. This was followed by sealing the groove with conventional glass ionomer cement (Ketac Molar, 3M ESPE, Seefeld, Bavaria, Germany) [Fig 3D].

The buccal bony cavity was then filled with demineralized freeze-dried

bone allograft and a collagen membrane was placed over it [Fig 3E,3F]. The flap was reapproximated, sutures were taken, and a periodontal pack was placed (Coe- Pak™; GC Inc., Alsip, IL, USA). The patient was scheduled for suture removal after one week, and a postoperative radiograph was taken [Fig 4A].

The patient was closely monitored for two years after the initial treatment. The tooth remained functional without any clinical symptoms, and there were no signs of recurrent infection or inflammation [Fig 5A,5B,5C]. The periapical radiograph showed the resolution of the lesion [Fig 4B].

DISCUSSION

The presence of a PGG in a tooth can lead to various types of lesions, such as primary endodontic, primary periodontal, or combined lesions, depending on the depth and location of the groove as well as the degree of bacterial contamination and inflammation in the affected area. This case report emphasizes the importance of an interdisciplinary approach in managing a PGG with a combined endodontic and periodontal lesion in the maxillary right lateral incisor.

The PGG can be a site of bacterial accumulation, leading to a combined endodontic and periodontal lesion that can produce a variety of clinical symptoms and radiographic manifestations. Symptoms include dull or acute pain,^[5,6] tooth mobility,^[7] pain on percussion,^[8] pus discharge,^[9] sinus tract formation,^[10] and gingival swelling,^[11] while a clinical examination reveals the presence of a groove on the palatal surface, attachment loss, pocket formation, and bleeding from probing, and the tooth is unresponsive to pulp sensibility testing, indicative of necrotic pulp.^[10,11] Radiographically, a pear-shaped radiolucency can be observed,^[12] along with a radiolucent para pulp line that is parallel or superimposed over the root canal.^[13]

Antimicrobial photodynamic therapy (aPDT) was used after surgical debridement and disinfection of the periapical lesion to help eliminate the remaining bacteria in the affected area.^[14] This was followed by the placement of a demineralized freeze-dried bone allograft (DFDBA) to enhance tissue regeneration and support the growth of new bone. Finally, a resorbable membrane was placed over the graft to protect it and provide stability during the healing process.^[15]

Restoring the groove with glass ionomer cement provides a smooth, impermeable surface that seals the groove and prevents bacteria and debris from accumulating in the affected area. Glass ionomer cement's antimicrobial activity and ability to facilitate epithelial and connective tissue attachment made it a useful material for restoring PGG and promoting healing.^[16]

This case report demonstrates that a combination of endodontic treatment and periodontal therapy and sealing of the PGG, effectively manages combined lesions related to the PGG. This is supported by previous reports^[10,11,17-19] on PGGs with combined lesions in the maxillary right lateral incisor.

CONCLUSION

The successful management of this complex case highlights the importance of a multidisciplinary approach to the treatment of combined endodontic and periodontal lesions in teeth associated with PGG. These types of lesions can be efficiently treated using endodontic therapy, periodontal treatment, odontoplasty, and periodontal regenerative techniques. The two-year follow-up period demonstrated the long-term success of the treatment, with no evidence of recurrence or complications.

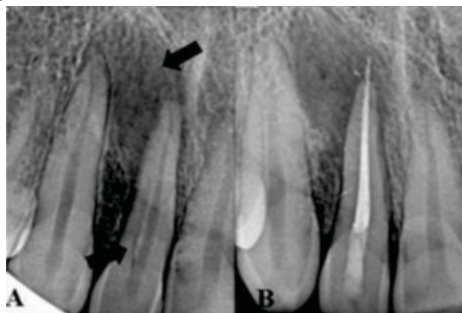


Fig 2. Preoperative radiograph (A) showing parapaternal line and pear shaped radiolucency and Postoperative radiograph (B).



Fig 1. Preoperative images. Buccal view (A) showing mucosal swelling (arrow mark) above tooth number 12, Palatal view (B) showing gingival inflammation (arrow mark) around tooth number 12, Isolated periodontal pocket (C) depth of 6 mm.

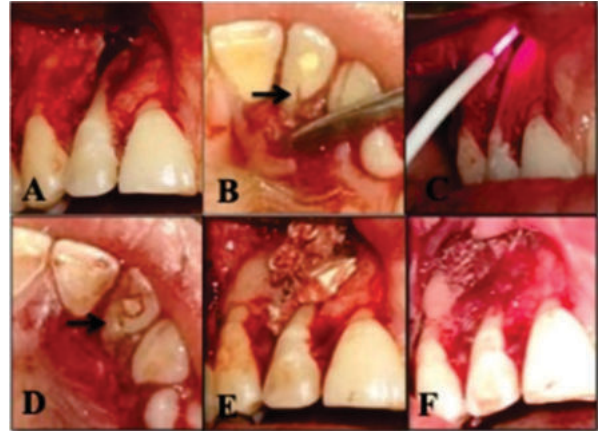


Fig 3. Intraoperative images. Cortical bone defect in the buccal view (A), Palatogingival groove (arrow mark) (B), Application of aPDT (C), Sealing the groove with GIC (arrow mark) (D), Demineralised freeze-dried bone allograft in the defect (E), collagen membrane placement (F).

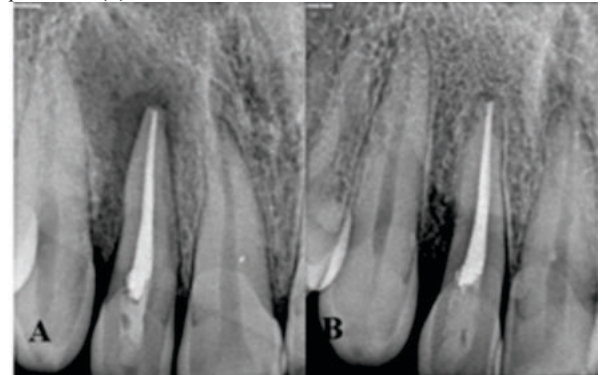


Fig. 4 Immediate Postoperative radiograph(A) and follow-up radiograph after two years showing healing of periapical lesion(B)



Fig 5. Postoperative follow-up images after two years. Buccal view (A) showing normal gingiva above tooth number 12, Palatal view (B) showing normal gingiva around tooth number 12, healed periodontal pocket (C).

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