CASE REPORT

PALATAL LINGUAL GROOVE RECOGNITION AND TREATMENT

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ABSTRACT: Radicular Lingual Groove is a developmental anomaly that has a predilection for maxillary lateral incisors. The clinical significance of this condition is that it acts as a retentive area for plaque which is difficult to keep clean. The result is an endodontal periodontal lesion. This case report presents the diagnosis and treatment options to treat the defect.

KEYWORDS: Radicular Lingual groove, Lateral incisor, Endo perio lesion

INTRODUCTION:
Radicular lingual groove (RLG) is a developmental anomaly mainly found on the palatal surface of maxillary lateral incisors and to some extent on the labial surface of maxillary central incisors. This groove has also been termed as radicular groove, cingulo-radicular distolingual groove, palato-gingival groove and vertical developmental groove. The anomaly might be unilateral or bilateral. Presence of RLG has also been observed in maxillary second molars. It is an enamel or cementum lined groove that usually initiates at the level of the cingulum extending along the root to varying lengths.

The etiology of the groove is not fully understood. One school of thought suggest that this defect is a mild form of dens invaginatus but there is only an infolding of epithelium resulting in a groove rather than an invagination that results in a circular opening.

Others believe that radicular groove formation may represent an aborted attempt to form an additional root. The presence of RLG does not always indicate the development of pathology. In most cases the epithelial attachment remains intact across the groove and the periodontium remains healthy. Once the attachment is breached due to endodontic involvement, a self containing periodontal pocket forms along the length of the groove. Inflammation can progress from an apical lesion coronally along the groove, causing a primary endodontic and secondary periodontal lesion. The epithelial attachment may also be breached by gingival irritation secondary to microbial plaque retention creating a periodontal defect. The inflammation can spread to the pulp through defects in the groove to involve the root apex.

This anomaly can pose dilemmas for diagnosis and clinical management. The RGL might escape detection until patient presents with advanced pulpal pathology with secondary periodontal involvement. The clinical significance of this funnel shaped defect lies in the fact that it makes the tooth a susceptible niche for bacterial plaque accumulation and subsequent inflammation. Prognosis of teeth affected by this anomaly depends upon the depth and extension of the groove. Shallow grooves may be corrected by odontoplasty in conjunction with periodontal treatment. Grooves that are more advanced, prognosis may be poor due to pulpal or periodontal breakdown.

This article presents a case of a lateral incisor anatomically complicated with a RLG. The rationale behind the treatment modalities has been discussed.

CASE REPORT

A 40 year old female patient presented in the outpatient department with a complaint of pain, pus discharge from upper anterior region and bad mouth odour. History revealed that pain was mild and intermittent. Clinical examination showed the gingiva on the labial aspect was inflamed and edematous and bleeding on probing and pus discharge from the palatal gingival sulcus area. Soft tissue examination revealed a draining sinus tract on the labial alveolar mucosa associated with maxillary left lateral incisor (Fig 2A). Mobility of tooth was within physiological limits. Oral hygiene was fair. Medical history was non contributory. Hard tissue examination revealed the tooth # 22 to have an intact crown without caries or fracture. A radicular lingual groove on the distopalatal aspect of the tooth starting from the cingulum area of the crown into the gingival sulcus creating a 8mm pocket with purulent exudates (Fig 2 B). Facialy the gingival sulcus had normal probing depth. Since bilateral occurrence of RLG is possible, tooth # 12 was also examined but no evidence of the same was found after sulcular probing and radiography. Radiographically, there was a large localized lateral bony defect encircling the root apex of the affected tooth (Fig 1A).

Thermal and electric vitality tests gave a negative response confirming the diagnosis of nonvital pulp. The sinus tract and periodontal pocket revealed the communication with the apical area confirming the diagnosis of chronic supplicative apical periodontitis. The bony lesion appeared to be a combined endo-perio lesion.

Treatment plan comprised of oral prophylaxis followed by primary endodontic management and periodontal pocket elimination and groove repair. Under rubber dam isolation, the standard access cavity was prepared followed by cleaning and shaping using and crown down technique upto an apical file size 50. Root canal was debrided using copious irrigation with 3% Sodium Hypochlorite and final rinse with saline before closing. Calcium hydroxide dressing was placed between appointments. One week later obturation was completed by cold lateral condensation an AH Plus as sealer (Fig 1B). Access was sealed with composite. Two weeks later, after the sinus tract had healed the palatal pocket could still be probed (8 mm). Periodontal flap surgery for pocket elimination was scheduled. A full thickness

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mucoperiosteal flap was reflected on the palatal aspect and the RGL was isolated to its most apical extent (Fig 2D). Granulation tissue was curetted from the apical defect and surrounding area to leave soft tissue more conductive to regeneration (Fig 2C). Thorough scaling and root planing was performed over the groove the bacteria that might have colonized there. The groove was saucerised, i.e a small round diamond bur was used to hollow out the defect to its depth (Fig 2E). A chemical conditioning of the groove was performed by using 10% polyacrylic acid and GIC type II was applied over the defect (Fig 2F). The surrounding area was kept isolated from blood and tissue fluids during setting of the cement by using local hemostatic gelatin sponge. After the cement had hardened the apical defect was filled with bone graft (Fig 2G). The flap was readapted and stabilized with sling sutures and wound site was covered with non eugenol periodontal dressing. The patient was given post surgery precautions and maintenance protocol instructions which included non steroidal anti inflammatory drug, ibuprofen 400mg three times daily for three days and 0.2% chlorhexidine mouth rinse twice daily for two weeks. One week following surgery the dressings and sutures were removed. Healing after surgery was uneventful. The patient was put on periodic recall after 1,3,6,12 months post operatively during which radiographs were taken for evaluation of the endodontic and periodontal status. During this period, the probing depth gradually reduced to about 3mm (Fig 2H). Radiographically, there was complete disappearance of radiolucency around the lateral incisor suggesting bone fill of the previously existing osseous defect (Fig 1C).

DISCUSSION
Radicular lingual groove is a rare developmental anomaly with a prevalence of 2.8-8.5%. Successful treatment of RLG depends on the ability to eradicate inflammatory irritants by eliminating the groove. RLG acts as a “plaque trap” facilitating the development of a combined endodontic periodontal lesion because there might be a communication between the pulp canal system and the periodontium through the accessory canals. This might even lead to being diagnosed as a primary endodontal lesion. The diagnosis might further be complicated because the picture might point towards a periodontal abscess, and radiographically the RLG might appear like a vertical root fracture or an extra root canal. Prognosis of teeth affected by this anomaly depends of the location, depth and extension of the groove and the extent of periodontal destruction. Teeth with mobility within normal limits and shallow grooves can be corrected by odontoplasty in conjunction with periodontal treatment including curettage of granulation tissue. However when the groove is more advanced with associated extensive periodontal destruction, the management becomes complex. Successful treatment of this particular type of RLG depends on the ability to eradicate inflammatory irritants by eliminating the groove and encouraging the patient to keep good hygiene.

In the past combined endodontic-periodontal lesions of this sort were often untreatable by any means other than extraction. Treatment options that have been performed are curettage of the affected tissues, burring out the groove with a round burr.
(saucerization),\textsuperscript{11} sealing the groove with a variety of materials,\textsuperscript{11} root canal therapy as a primary or secondary endodontic lesion,\textsuperscript{2} surgical procedures including guided tissue regeneration therapy and intentional replantation.\textsuperscript{12} Odontoplasty was carried out by saucerization of the groove along its entire length to eliminate bacterial plaque and calculus and to prevent bacterial recolonisation. Materials that have been suggested to fill the groove in the past are Silver amalgam,\textsuperscript{13} Composite,\textsuperscript{14} Glass Ionomer Cement (GIC),\textsuperscript{15} Dense hydroxy apatite alloplast,\textsuperscript{16} emdogain\textsuperscript{17} to name a few. In this case GIC type II was used to seal the defect. GIC has advantages of antibacterial effect, chemical adhesion to the tooth structure adequate sealing ability and promoting epithelial and connective tissue attachment.\textsuperscript{18} Regeneration of periodontal attachment and bone and consequently improvement of the clinical conditions was observed by reduction in pocket depth from 8mm to 3mm. Cleaning and sealing of coronal portion of the groove to prevent bacterial colonization. Conditioning of the groove removes the surface debris, increases the wettability and increases bond strength of GIC cement\textsuperscript{18}. Since there was an advanced bony defect that surrounded the root, a synthetic alloplast hydroxyapatite bone graft (RTR bone graft, Septodont) was placed to promote bone regeneration. Healing was uneventful. A one year post operative follow up revealed increased radiodensity at the apex. The patient was asymptomatic and a 3mm non bleeding sulcus was present on the lingual aspect.

CONCLUSION

Radicular lingual grooves are most often missed out during oral examination. Such deep grooves can predispose to pulpal necrosis and treatment failure due to lack of awareness by the clinician. This case reported the successful management a primary pulpal and secondary periodontal lesion complicated by the presence of a RLG. A multidisciplinary approach from diagnosis to treatment can help salvage an otherwise hopeless tooth.

REFERENCES