

Treatment of an intrabony osseous lesion associated with a palatoradicular groove

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Abstract

Various root developmental anomalies like palatoradicular groove (PRG) have been associated with worsening of periodontal condition. The aim of the present case report is to describe the regenerative surgical treatment of periodontal and osseous lesion associated with the subgingival extension of PRG. A 23-year-old female patient reported with pain in upper incisor teeth region. On clinical and radiological examination, a deep endosseous defect was found distal to maxillary right lateral incisor that was etiologically associated with the presence of a PRG. Treatment procedures consisted of: Regenerative periodontal therapy using Guided tissue regeneration (GTR) and hydroxyapatite (HA) bone graft and 2) flattening of the radicular portion of the palatal groove. The clinical examination at 1 year revealed shallow residual probing depth (3 mm) and no increase in gingival recession. The radiographic examination showed reduction in the radiolucency suggesting bone fill. A PRG may serve as a pathway for the development of a periodontal osseous defect. The combination of GTR and HA may be clinically and radiographically efficacious in the treatment of such a defect.

Keywords: Grafts, osseous defects, palatoradicular groove

Introduction

Several conditions exist around teeth that may predispose the periodontium to disease. One such anomaly occurring commonly in lateral incisors, that has received little study is the palatoradicular groove (PRG). These grooves usually begin in the central fossa, cross the cingulum and extend for various distances and directions down the root. In some cases these grooves present a diagnostic and treatment dilemma. The few references in the dental literature dealing with this anomaly note the relationship between it and severe, localized and often hopeless periodontal disease. While the etiology of periodontal disease is bacterial, factors like PRG allow the ingress of bacteria into the periodontium, and so should be considered in the diagnosis and the treatment of periodontal diseases.

Developmentally, PRG is thought to represent an infolding

of the enamel organ and Hertwig's epithelial root sheath.^[1] In 1958, *Oehlers* described for the first time a radicular invagination of an upper lateral incisor in a Chinese female.^[2] The presence of this anomaly compromises the patient's ability to perform adequate plaque control in the area, thereby leading to plaque accumulation, which in turn predisposes to localized periodontal destruction.^[3] The inflammatory process may extend apically along the groove resulting in endodontic involvement, which unfavorably affects the prognosis of the tooth.^[4] The reported prevalence of PRG varies from 2.8 to 8.5%,^[5,6] out of these; the maxillary lateral incisors are affected up to 90% of the times.^[6] The central incisors are affected less frequently.

Here we report a case of PRG occurring on maxillary lateral incisor associated with localized periodontitis and its management using guided tissue regeneration (GTR) and hydroxyapatite (HA) bone grafts in combination.

Case Report

An apparently healthy 23-year-old female patient reported with the chief complaint of pain in upper incisor teeth region since 1 year. There was occasional bleeding from the affected teeth while brushing. Examination of the maxillary incisors revealed the presence of palatogingival groove on distopalatal aspect of lateral incisor on the right side [Figure 1]. Gutta percha (GP) point was used to delineate the course of groove on the tooth and radiographic examination after placement of GP point was carried out to delineate course and extent of the groove [Figure 2]. On probing, 10-mm deep pocket was present on the palatal aspect of affected tooth [Figure 3], with no mobility. The pocket was present only along the groove. Radiographic examination

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revealed angular bone loss in relation to the distal aspect of the right lateral incisor. Thermal and electrical pulp testing showed normal response. Thus endodontic treatment was not indicated.

In the initial phase of the therapy, thorough scaling and root planing were carried out. Evaluation of the patient after 6 weeks showed a reduction in the probing depth to 8 mm. Following local anesthesia, a full-thickness mucoperiosteal flap was reflected [Figure 4]. Flap reflection and debridement allowed the complete visualization of the groove. The groove extended up to 5 mm on the root surface from the cemento-enamel junction [Figure 5]. Root planing was performed and odontoplasty was carried out with a high-speed diamond bur to eliminate the PRG completely. No pulpal exposure was observed. The exposed dentinal surface was coated with citric acid (pH 1) for 3 minutes and then gently irrigated with normal saline. Also a deep intrabony defect was observed on the distopalatal aspect of the right lateral incisor. The bony defect was filled with

a hydroxyapatite graft material, followed by placement of a resorbable membrane [Figures 6 and 7]. Flaps were approximated with the interrupted sutures of 3-0 black silk (Ethiprime, Mersilk, Ethicon, Johnson and Johnson Ltd., Somerville, NJ, USA) and periodontal dressing (Coe-pak, GC America Inc., Chicago, IL, USA) was placed. Sutures were removed 10 days postoperatively. The postsurgical healing period was uneventful. At 1-year recall appointment, reduction in probing depth to 3 mm was noted in the treated area [Figure 8]. Radiograph showed improvement in the bony defect and a bone fill of approximately 30 - 40% [Figure 9].

Discussion

The PRG is a developmental anomaly of variable extent and depth that may or may not involve a communication between the pulp cavity and the periodontal tissue. The anomaly has a variety of names: the palatogingival groove, the radicular lingual groove, the radicular groove, the



Figure 1: Clinical view demonstrating the presence of palatoradicular groove on distopalatal aspect of maxillary right lateral incisor

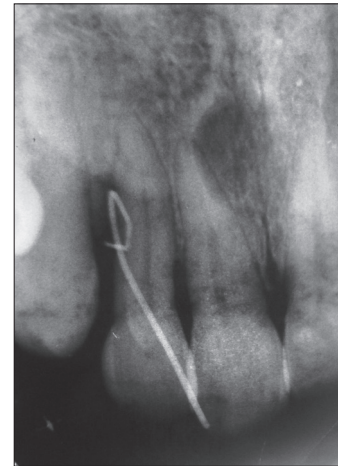


Figure 2: Baseline periapical radiograph of the tooth showing a gutta percha point placed along the radicular groove



Figure 3: Baseline palatal clinical view, showing a probing pocket depth of 8-mm distal to the involved tooth



Figure 4: Palatal clinical view after the elevation of flap, showing the osseous defect distal to the affected tooth



Figure 5: Palatal clinical view showing the palatoradicular groove



Figure 6: Placement of hydroxyapatite bone graft in the osseous defect



Figure 7: Placement of GTR resorbable membrane in the osseous defect



Figure 8: Palatal clinical photograph depicting a periodontal probing depth of 3 mm (1 year postoperative)



Figure 9: 1-year postoperative periapical radiograph showing bone fill in the osseous defect

palatoradicular groove, the facial radicular groove, the developmental groove, and the distolingual groove.^[7] According to their extent, the palato-gingival grooves are generally categorized into mild, moderate, and complex grooves.^[8] Mild grooves are gentle depressions of the coronal enamel that terminate at or immediately after crossing the cemento-enamel junction. Moderate grooves continue to extend some distance apically along the

surface in the form of a shallow or fissured defect. Complex grooves are deeply invaginated defects that involve the entire length of the root or that separate an accessory root from the main root trunk. In the present case, the groove was of the moderate type.

The PRGs are most commonly located on the midpalatal surface rather than on the lateral surfaces. However, grooves on the mesial and distal surfaces are more frequently associated with periodontal pockets.^[9,10] Distal and mesial location of the groove can be considered a clinically adverse factor, since plaque more rapidly accumulates in these regions and are removed with greater difficulty.^[10] In the present case, the groove was located on the distopalatal aspect of maxillary lateral incisor. Various treatment modalities have been advocated for the treatment of periodontal lesions associated with palatogingival grooves. These include scaling and root planing, flap curettage, bone grafts, guided tissue regeneration, and use of enamel matrix proteins.^[11-13] The grooves can be eliminated by odontoplasty in the case of shallow ones or by restoring with amalgam, composite or glass ionomer cements.^[8,14,15] In our case, an odontoplasty was carried out to flatten the grooves, as they were shallow.

Summary

GTR and HA can be used to treat a periodontal osseous defect etiologically associated with a PRG.

The success of such a case depends primarily on precise placement of GTR and adequate maintenance of the site by the patient.

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