



Case Report

Palatoradicular Groove, A Multifaceted Loophole: A Case Report

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ABSTRACT: Palatoradicular groove is a rare developmental anomaly which is usually found on the palatal aspect of maxillary anterior teeth. The groove when left undiagnosed will usually be associated with deep local periodontal pathology. This case report discusses the elimination of periodontal pathology caused by a shallow palatoradicular groove which acted as nidus and regeneration of lost periodontium using bone grafting and guided tissue regeneration with improved clinical outcome.

Keywords: Palatoradicular groove, periodontal pocket, clinical attachment level gain, periodontal disease

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INTRODUCTION

Palatoradicular groove is a prevalent developmental morphological anomaly of the maxillary incisor tooth which is often involved with severe localised periodontitis. With the prevalence rate of 2.8%–8.5%, its occurrence varies in

different populations [1,2]. It is also known by other names Palatogingival Groove, Radicular Lingual Groove, Disto-lingual Groove, Corono-radicular Groove, Cingulo-radicular Groove, Vertical developmental Radicular Groove and Interruption Groove.

The palatal groove is formed because of an infolding of the enamel organ and Hertwig's root sheath which could be due to the alteration of genetic mechanism [3]. Proper Oral Hygiene Maintenance around such defective grooves is challenging, since the groove provides path for pathogens to penetrate into the periodontal ligament area, resulting in a periodontal pocket along the depth of the groove [4].

Palato-radicular groove can pre-dispose to periodontal disease development. The inherent difficulties in the identification of the palatoradicular groove make its diagnosis and treatment complex for dental practitioners, since it is missed out in most of the cases during routine dental checkup. In most of the cases, palatoradicular groove is diagnosed only when there is an established periodontal pathology. So, it is a prime importance for a dental practitioner to have a glimpse at the palatal surface of the maxillary incisors in a routine dental examination instead of letting the periodontal pathology to get established to an advanced lesion. This paper reports a case of palatoradicular groove in the maxillary central incisor which was successfully treated with surgical regenerative procedures.

CASE REPORT

A 29 year old male patient reported with chief complaint of intermittent dull pain in upper front tooth and loosening of upper front tooth since 6 months. No history of trauma was given. Patient was not having any medical comorbidities. On examination the gingiva was apparently healthy with fair oral hygiene status (Fig 1) and in palatal aspect of tooth 11, soft deposit was present, gingiva was slightly inflamed only in the palatal aspect of tooth 11. Mobility was Grade I on the day of examination. Bleeding on probing was positive with probing depth of 2mm in labial aspect (Fig 2), but 9mm (Fig 3) in palatal region of tooth 11 (UNC-15 probe, Hu-Friedy™). Palatoradicular groove extending till cervical 1/3rd of the root was appreciated. Intra oral periapical radiograph revealed arc shaped intra bony defect extending beyond the middle third of the root with loss of lamina dura extending beyond middle 1/3rd of the tooth 11(Fig 4). Based on the clinical and radiographic findings, it was diagnosed as localized chronic periodontitis which was caused by a palatoradicular groove in tooth 11.

Following phase 1 periodontal therapy, surgical intervention of the periodontal pathology was planned. Under local anaesthesia, access flap was elevated in 12,11 and 21 palatally using sub papillary incision (Fig 5) in the labial interdental papilla (to avoid disruption to the grafting site) in relation to tooth 11 both mesially and distally.

After thorough debridement, a shallow and short palatoradicular groove extending till cervical 1/3rd of the root of tooth 11 was evident (Fig 6). A wide and deep circumferential bony defect in the palatal aspect of tooth 11 was appreciated (Fig 7) following complete degranulation. Surprisingly, even with such extensive bone loss, the tooth

was showing just grade I mobility. The reason for the stability of the tooth was ruled out after raising the flap in labial surface. An isolated spike of bone from the tooth 12, interdental was circumferentially holding around the cervical 1/3rd of the root of tooth 11(Fig 8), which was giving a splinting effect to the periodontally compromised tooth. Since the palatoradicular groove was not so deep and longer, odontoplasty was performed using diamond finishing burs to eliminate the groove.

The osseous defect was filled and condensed with xenograft bone graft material (Osseograft™) and GTR membrane (Healiguide™) is placed over the bone graft both labially and palatally (Fig 9, 10). The flap closure was done by interrupted figure 8 technique using 3.0 silk suture material (Fig 11) and perio-dontal dressing (COE Pack™) was placed over the surgical site to safeguard the grafting site (Fig 12) and post-operative instructions were given. Post-operative medications included Antibiotics (Amoxicillin 500mg & Metronidazole 400 mg) thrice a day and twice a day respectively and analgesic (Aceclofenac paracetamol) twice a day for five days.

One week later, periodontal dressing was removed and Suture removal was done carefully to ensure that bone grafting is not disturbed. One month postoperatively, the gingiva appeared healthy (Fig 13,14), and the patient maintained meticulous oral hygiene. Postoperative review after 3 months revealed healthy gingiva (Fig 15), reduction in pocket depth (Fig 16) and no tooth mobility of 11. IOPA radiograph taken at 3 months showed relatively significant evidence of bone formation at the formerly lost area (Fig 17).



Fig 1: Healthy labial gingiva around 11



Fig 2: 2mm probing depth labial of 11



Fig 3: 9mm probing depth palatal of 11



Fig 4: Arc shaped radiolucency around 11



Fig 5: Sub-Papillary incisions labially



Fig 6: Shallow & short Palatoradicular groove in 11

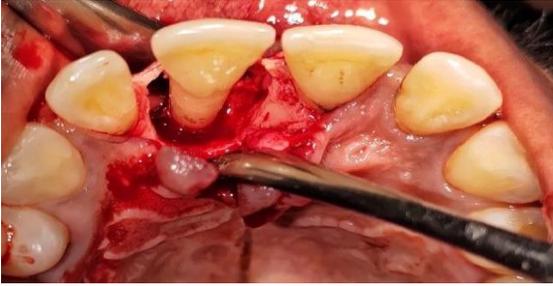


Fig 7: Circumferential osseous defect in relation to 11



Fig 8: Osseous spike extending from 12 giving a splinting effect to 11



Fig 9: Bone grafting along with membrane placement labially.



Fig 10: Bone grafting along with membrane placement palatally



Fig 11: Flap closure using 3.0 silk suture material.



Fig 12: Periodontal dressing in place.



Fig 13: 1 month postoperative healing palatal view



Fig 14: 1 month postoperative healing labial view



Fig 15: 3 months postoperative healing palatal view



Fig 16: Complete reduction in probing depth palatally



Fig 17: Radiographic evidence of bone fill 3 months after surgery.

DISCUSSION

Palato-radicular grooves are developmental root deformities that provide a niche for bacterial accumulation and colonisation, which is further progressed into a periodontal pathology if left undiagnosed. The presence of such anatomical defect always complicates the treatment of the same. In most of the cases, it is diagnosed only because of pain on percussion, [5] pus discharge, [6,7] gingival swelling [8] and sometimes it can be also diagnosed during routine dental check up in a periodontally healthy dentition [9].

The anatomy, location, extent and accessibility of the groove along with the severity of periodontal disease affects the clinical outcome and prognosis of the tooth [10]. This case report exhibited a palatoradicular groove which was shallow and short but with an extensive periodontal involvement which includes a circumferential osseous defect around the tooth [11] beyond the middle 1/3rd of the tooth.

Though various theories and treatment modalities have been developed, Melcher's theory is the most widely accepted theory which states that only undifferentiated mesenchymal cells from the periodontal ligament have the ability to differentiate and regenerate the supporting structures of the tooth [11]. Our present case displayed the necessity of enhancing the periodontal regeneration to restore the healthy periodontium around the affected tooth.

Guided tissue regeneration which is based on the rationale given in Melchers concept, is the gold standard treatment for periodontal regeneration. Use of GTR techniques in the treatment of palatoradicular grooves have resulted in improved clinical outcomes [12]. Therefore, bone grafting with guided tissue regeneration was the technique preferred in this case, since the GTR procedures have been proven to be clinically having better treatment outcomes in the form of clinical attachment gain when compared to other regenerative surgical protocols [13].

The placement of bone graft along with GTR membrane in this case showed satisfactory result by reducing the pocket depth to 2-3mm 3 months post operatively. The radiographic evaluation of the site after 3 months of surgery revealed mild radio opacity that indications evidence of osseous regeneration when compared to the pre-operative level.

In the present case scenario, resolution of the patient's initial symptoms were noted. There was a great improvement in the clinical parameters like probing pocket depth and clinical attachment level gain along with bone fill (Fig 17). However, long-term follow up of the case is warranted to further analyse the long-term effects on the clinical outcomes following GTR based treatments of palato-radicular grooves.

CONCLUSION

The diagnosis of the palatoradicular groove is crucial due to the complex pathological changes that occurs in a period of time when left undiagnosed and untreated. The key to achieving long-term favourable outcome in this unique pathology is accurate diagnosis and prompt treatment of the same. With the limitations of the present case report, it could be concluded that a accurate diagnosis followed by prompt treatment along with a meticulous

understanding etiopathology of palatoradicular grooves related disease progression would enable clinicians to efficaciously manage such conditions, thereby greatly improving the quality of life of patients.

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