

Anatomic anomalies involving the same tooth: A rare phenomenon



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ABSTRACT

|| Brief Background

Dental plaque is the primary aetiological factor in periodontal disease. Developmental aberrations like Cervical Enamel Projection (CEP) and anomalies such as root fusion may predispose the affected area to plaque accumulation and consequently cause periodontal breakdown. The aim of this report is to present a case of localized periodontal disease associated with cervical enamel projection on the palatal aspect of maxillary second molar with two palatal roots and root fusion.

|| Materials and Methods

A Cone Beam Computed Tomography was done which revealed four roots (double palatal roots) and a palatal CEP. It also showed root fusion between mesiobuccal and mesiopalatal roots. After emergency care and phase I therapy, periodontal flap surgery was scheduled. An intrabony defect was present adjacent to the CEP. The CEP was removed by odontoplasty and bone allograft was placed in the intrabony defect.

|| Discussion

Anatomic anomalies as presented contribute to periodontal disease, as they are inaccessible to routine oral hygiene methods. They contribute to localized periodontal disease often with an associated intrabony defect. Such cases demand not only the elimination of the anomalies, but also an attempt to regenerate the lost periodontium.

|| Summary and Conclusions

CEP and root fusion act as local contributory factors in periodontal disease. Early diagnosis and treatment, combined with patient cooperation and motivation, can improve the prognosis of the involved teeth.

|| Key Words

Cervical Enamel Projection, Double palatal roots, root fusion.

|| Introduction

Dental plaque has been implicated as the primary aetiology in periodontal disease (Loe et al., 1965). Enamel, which is normally restricted to the anatomic crowns of human permanent teeth, may be found ectopically on the root, either as enamel pearls or as cervical enamel projections (CEP). CEP has been defined as a dipping of the enamel from the cement-enamel junction towards the furcal area of molars (Bissada and Abdelmalek, 1973). Prevalence of cervical enamel projections ranges from 8.6% to 85%¹. Although bacterial plaque is a primary cause of the initiation and progression of periodontal disease, anatomic factors such as CEP are often associated with advanced localized periodontal destruction. CEPs in furcations are known to predispose the area to attachment loss.² Poor periodontal health, also appears to be strongly associated with the presence of root fusion. Diseased molars with root fusion have a greater risk of developing significant pocket depth and attachment loss than healthy molars.³

The aim of this report is to present a case of cervical enamel projection on the palatal aspect of maxillary second molar with 2 palatal roots and root fusion between mesiobuccal and mesiopalatal roots. This case may be the first of its kind to be reported in which 3 anatomic anomalies affect the same tooth:

1. Double palatal roots
2. Palatal Cervical Enamel Projection
3. Root fusion.

|| Case Report

A 36 year old systemically healthy female patient came to the Department of Periodontics in our institute with a chief complaint of severe pain and pus discharge from gums in the upper right back tooth since 3 days. On clinical examination, she had a periodontal abscess on palatal aspect of 17 (Fig. 1). IOPA X-ray of 17 showed two palatal roots and mild horizontal bone loss (Fig. 2). Clinically she had Grade II furcation involvement palatally, with no pathology on buccal aspect. Her oral hygiene status was fair (Greene & Vermillion Index). Overall periodontal status was good, except with 17. Hence a diagnosis of localized chronic periodontitis in relation to 17 was made. A CBCT (Coned Beam Computed Tomography) examination

was done to confirm the number of roots and it confirmed two palatal roots and two buccal roots with a palatal cervical enamel projection - CEP (Fig. 3). Also, the mesiobuccal and mesiopalatal roots were fused till apical third (Fig. 4 & 5). Prognosis for the tooth was fair. Treatment consisted of analgesic (Ibuprofen 400mg + Paracetamol 325mg TDS) and antibiotic (Metronidazole 400mg TDS) for three days. After three days, thorough oral prophylaxis was performed with subgingival scaling in relation to 17, palatally. Oral hygiene instructions were given to the patient. After one month, re-evaluation was done, which revealed 7mm deep pocket palatally. The patient was scheduled for flap surgery.

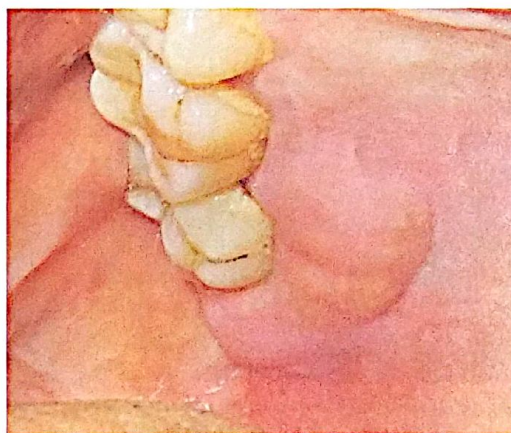


Fig. 1: Periodontal abscess in relation to 17 palatally.

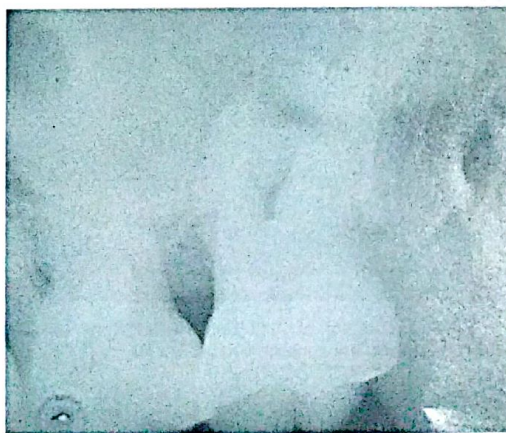


Fig. 2: IOPA X ray of 17. Note double palatal roots and bone loss.

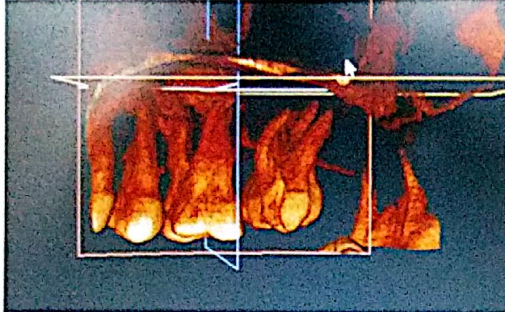


Fig. 3: Reconstructed CBCT of 17 region showing double palatal roots with a palatal CEP.

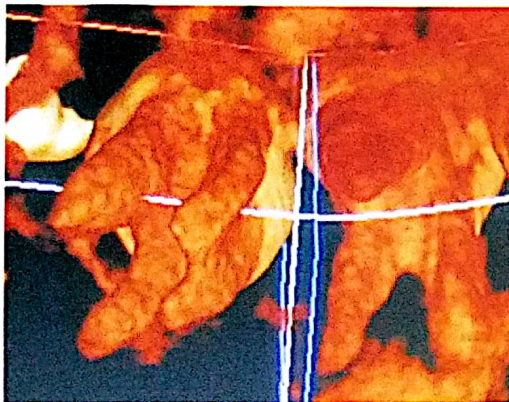


Fig. 4: Reconstructed CBCT, apical aspect, showing root fusion between mesiobuccal & mesiopalatal roots.



Fig. 5: Transverse section of CBCT. Note the root fusion between mesiobuccal & mesiopalatal roots.

Prior to the surgical procedure, written consent was obtained from the patient. Under local anaesthesia, sulcular incisions were given and full thickness

mucoperiosteal flap was reflected. On reflection of the flap, it was observed that CEP was present up to the furcation of the two palatal roots (Fig. 6). After thorough debridement, CEP was removed by odontoplasty. DFDBA (Decalcified Freeze Dried Bone allograft), was placed, since there was an intrabony defect. 3-0 Silk sutures were given and periodontal dressing was placed. Patient was advised to avoid brushing at the surgical site for 1 week. Postsurgical antibiotics and analgesics were prescribed for 3 days (Amoxicillin 500mg TDS and Paracetamol 500mg TDS). 0.2% chlorhexidine mouthwash, 10ml, 1:1 dilution, twice daily, was prescribed for 1 week. Sutures were removed after 1 week. She was followed up, every 15 days for three months after surgery.

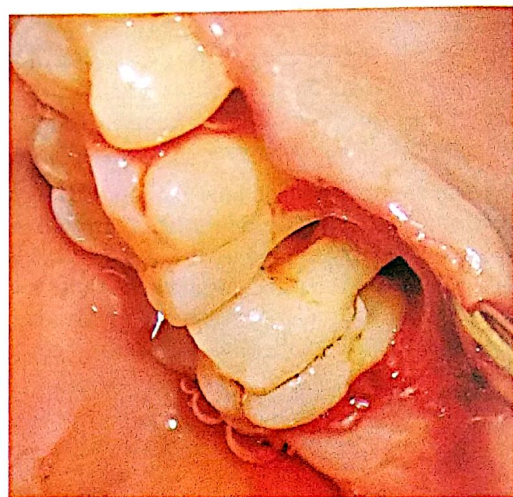


Fig. 6: Clinical picture of CEP after debridement. Note palatal root bifurcation & intrabony defect below the CEP.

The patient showed uneventful healing. Good periodontal maintenance was observed. The surgically treated area, showed good healing and healthy gingiva three months after the surgery.

|| Discussion

In 1949, Atkinson first mentioned the possible relationship between CEPs and periodontal pocket formation. Several studies have reported the prevalence of CEP ranging from 8.6% to 85%.¹ The variations might have resulted from different study designs and ethnic populations. CEPs are most likely found on

the buccal surfaces of mandibular molars (Bissada & Abdelmalek, 1973). Hou & Tsai (1987) reported high prevalence of CEP (82.5%) in teeth with bifurcation involvement. Palatal CEP on maxillary molars is a rare phenomenon.

Master and Hoskins suggested a classification system based on the extent of cervical enamel projecting into to the furcation area. In grade I, there is a distinct change in the CEJ in which enamel slightly projects into the bifurcation area. In grade II, the CEP margins approach the bifurcation area but do not invade it completely. In grade III, the CEP is in direct contact with the bifurcation area (Masters and Hoskin's, 1964).

The dento-gingival relationship at cervical enamel projections is peculiar for having an extended junctional epithelium instead of a connective tissue attachment², i.e., attachment with periodontal ligament. Connective tissue cannot form an attachment to enamel. Instead, the junctional epithelium is present in these areas and consists of hemidesmosomes and basal lamina. As a result, when enamel forms on roots, it may predispose the area to increased probing depths in the presence of gingival inflammation. Goldstein described this attachment as a "locus minoris resistentis" and hypothesized that this form of attachment would constitute an area of less resistance to plaque-associated inflammatory degradation.¹ In the presence of plaque and inflammation, such teeth are prone to develop localized periodontal disease and bone loss, due to decreased resistance of the involved area.

Several studies have revealed that the majority of maxillary molar teeth have three roots (Adanir, 2007). The least frequent anomaly affecting maxillary molars appears to be that of the double palatal roots (Christie et al., 1991). Libfeld and Rotstein (1989) have reported an occurrence rate of double palatal roots as 0.4%, presumably on the maxillary second molar.

Molar root fusion can also act as a local contributory factor in periodontal disease. Diseased molars with root fusion have a greater risk of developing significant

attachment loss than healthy molars. The clinical significance of developmental grooves on molar root fusions for localized periodontitis is probably related to the poor periodontal health and invasion by pocket formation. Once breakdown occurs, rapid progression of localized periodontal destruction becomes more likely because of the specific morphology of deep developmental grooves in the fused roots at diseased sites that allows accumulation of dental plaque. Root fusion also decreases the overall periodontal support of the tooth.³

Early diagnosis of these anomalies, i.e. CEP and root fusion, may improve the prognosis of the involved teeth (Machtei et al., 1997). CEP removal is generally recommended during periodontal surgeries to allow new attachment to form.¹ One study showed that mandibular molars with Class II furcation involvement and CEPs could achieve similar results when enamoplasty / odontoplasty was performed as compared to those without CEPs using various surgical modalities.¹ Machtei et al., 1997, found that, although CEPs were associated with deeper probing depths at baseline, teeth with CEPs gained more attachment after enamoplasty/odontoplasty in conjunction with regenerative procedures than teeth without CEPs that received the same surgical approaches. Hence, in the present case, Grade II CEP was removed by odontoplasty followed by placement of DFDBA to aid in regeneration.

|| Conclusion

Cervical enamel projection on a tooth indicates decreased resistance of the area to plaque associated inflammatory periodontal disease. Presence of root fusion and developmental groove at the area of fusion, which cannot be eliminated, is an area of concern and prone to develop periodontal disease if not maintained well. Early diagnosis and treatment, combined with patient cooperation and motivation, can improve the prognosis of the involved teeth.

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