ENAMEL PEARL

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ABSTRACT

The developmental anomaly of enamel, Enamel pearls (EPs) has been reported since 1841 with several names its origin is still unclear. They are commonly located in maxillary molars, there is a possibility to find them in any tooth in different sizes & have also seen in primary teeth as previously reported. Three types of enamel pearls have been described along with a variable prevalence and symptoms with clinical implications that must be taken into consideration. Routine exams in dental practice such as panoramic digital radiographs are useful for the detection of enamel pearls, and their exact location could be also addressed using three-dimension imagining technology (CBCT), The presence of EPs is not always associated but few EPs can be a risk factor to develop endodontic and periodontal unfavorable conditions for the affected teeth.

Keywords: Epithelial rests, Enamel pearl, root development, periodontal disease

INTRODUCTION

Enamel pearls are developmental anomalies of enamel described by Linderer in 1841 as a 'pin's head' as enamel deposits mostly found on in the bifurcation areas of the root surface near the cementoenamel junction (CEJ) also has several names like enameloma, enamel globules or enamel droplets. Origin of Enamel pearl is still unclear, and the most accepted theories for its etiology a developmental localized activity of Hertwig epithelial root sheath (HERS) remnants that are adherent to the root surface during the root development. After root formation HERS eventually fragments to the epithelial cell rests of Malassez (ERMs) it suggested that ERMs could differentiate into ameloblast-like cells. producing enamel organic matrix deposits on the root. The capability of those enamel producing ameloblast-like cells might suggest their involvement in the mechanism of enamel pearl formation. Enamel the hardest tissue in the vertebrate body but the regenerative capability of this is limited due to cell apoptosis following maturation of the tissue, presence of the enamel pearls separates from the developed enamel organ. Since the enamel pearl is being nucleated in the absence of underlying mesenchyme, this phenomenon directly proves that neither collagen from dentin nor a mineral substrate for epitaxial growth is required to form the complex, mineralized enamel tissue.[1-3] research by Zhan Huang et.al. concludes that the pearl is a nodule of regenerated enamel, organized by polarized ameloblast cells that surround the peptide amphiphiles (Pas) injection site. These cells are sufficiently differentiated to secrete enamel matrix proteins from their apical pole into the extracellular

matrix space forming regenerated ectopic enamel pearl and the cells contributing to the formation of the pearls most likely arise from cells of the enamel organ.[2] It is still not understood what is necessary conditions through which this differentiation of the ameloblast can occur in an ectopic location. Enamel pearls are small rounded nodules that most frequently develop in the furcation area of molars and consist either of enamel alone or enamel containing a small core of tubular dentin.[1-6] The prevalence of enamel pearls is variable in the literature it ranges from 1.1% to 9.7% The prevalence of enamel pearls varies according to the population studied and is highest in Asians [2,6]

In the literature, Enamel pearls are described as three types [1]
A] true enamel pearls, which are composed by enamel only
B] composite enamel pearls, which contain a core of tubular dentine;
C] enamel dentin pulp pearls, which contain a pulp horn that may be an extension from the pulp chamber or root canal

The size and location of enamel pearls are variable, ranging in size from 0.3 mm to 4 mm in diameter or even greater to measurements of 1.8 mm wide and 8 mm long. Enamel pearls are small rounded nodules that most frequently develop in the furcation/bifurcation or trifurcation of teeth The majority occur on the roots near the cementoenamel junction area of molars, premolars and incisors rarely are affected, the involvement of deciduous molars has been reported, In most of the cases, one pearl is found in the bifurcation but it's been documented four pearls on a single tooth.[7,8]

Anatomic factors, like furcations, root concavities, developmental grooves, cervical enamel projections, enamel pearls and bifurcation ridges have the potential to harbor bacterial plaque. The presence of these enamel projections on the root surface interferes with the attachment apparatus.[11-13]

Generally, enamel pearl is of little significance, the enamel surface with pearls precludes normal periodontal attachment with connective tissue and a hemidesmosomal junction may exist but this junction may be less resistant to breakdown and once separation occurs a rapid loss of attachment is likely, leading to plaque retention and inadequate cleansing, enamel pearl may contribute or provoke to the extension of a periodontal pocket.

Although not clearly defined as risk factors for periodontitis, anatomic factors and restorative factors that influence plaque accumulation may play a role in disease susceptibility for specific teeth.[12,13] When a composite enamel pearl or enamel dentin pulp pearl is diagnosed it may have implications for endodontic treatment.[1,8,9]

Radiographically, enamel pearls appear as well-defined, radiopaque nodules,panoramic digital radiographs seem to be useful for the detection of asymptomatic enamel pearls Mature internal enamel pearls appear as well-defined circular areas of radiodensity, extending from the dentin enamel junction (DEJ) into the underlying coronal dentin. [1,8]

Few enamel pearls might miss in routine radiographs, as reported by Versiani CBCT scan allowed the detection of a small enamel pearl in the furcation area between the MP and DP roots as both the 5 roots and the enamel pearl of the right MSM were not identifiable by the panoramic radiography which was obtained two weeks before the CBCT scan.[14]

All the cases might not require the treatment, Odontoplasty can be performed if required to gain adequate access to the defect and to reduce or eliminate cervical enamel projections or enamel pearls.[15]

CONCLUSION

Enamel pearls are thought to be derived from a Hertwig epithelial root sheath (HERS) remnant, with a variable prevalence.The enamel pearl is more frequently in maxillary molars, usually asymptomatic but can be associated with periodontal pockets where they are. Panoramic digital radiographs seem to be useful for the detection of asymptomatic enamel pearls CBCT scan allowed the detection of a small enamel pearl in the furcation area and helps to confirm its presence in case of the suspect.

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