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...that the anatomy of a tooth can predispose it to periodontal disease?

We all know that the primary etiology of periodontal diseases is plaque. Any tooth anatomy supporting a biofilm niche which creates a localized periodontal pocket is a secondary etiological factor. Let's dive into what these developmental features are.

Developmental grooves

The best-known developmental groove is the palatoradicular groove found in maxillary incisors. Lateral incisors are more commonly affected than central incisors, with respective prevalence rates of 4% and 0.3%. The grooves tend to present unilaterally with a localized deep pocket. More than half of these grooves extend ≥ 5 mm apical to the cemento-enamel junction. Tooth prognosis depends on the groove's apical extent and its potential to be eliminated via odontoplasty. Treatment options range from guided tissue regeneration (GTR) to extraction.

Root concavities

Unlike grooves, root concavities are larger and oftentimes cannot be recontoured. Notably all maxillary first bicusps have a mesial root concavity of 0.4 mm average depth. Furcal concavities are 99-100% prevalent in mandibular molar roots. In maxillary molars, these concavities are found most often in the mesiobuccal root, followed by the distobuccal and palatal roots. The management of root concavities emphasizes excellent oral hygiene - an appropriately sized interdental brush is recommended. Care must be taken during restorative treatment at the proximal concavities, as they pose a challenge in matrix band adaptation. Creation of overhangs, also an etiological factor, promotes an environment rich in periodontal pathogens.

Furcations

A whole textbook could be written on furcations - they make things so complicated just like Avril Lavigne sang. They are difficult to access and keep clean. While the average curette width is 0.7-1 mm, 58% of molar furcation entrance diameters are ≤ 0.75 mm. Approximately 70% of mandibular molar furcations also present with a cementum outgrowth known as the intermediate bifurcation ridge. Many factors affect prognosis, including root divergence, root trunk length and root fusion. Treatment options are largely based on the degree of furcation involvement:

- Class I: non-surgical therapy
- Class II: most amenable to GTR
- Class III: prognosis is significantly decreased and treatment options focus on oral hygiene effectiveness and access.

Cervical enamel projections

Ah, the tooth Speedos. Enamel projects towards the furcation during development and prevents connective tissue attachment, resulting in a pocket. CEPs may be detected clinically and/or radiographically. They favour the buccal surface, mandible and second molars. When associated with a furcation involvement, its subsequent removal via odontoplasty greatly improves furcation treatment success.

Enamel pearls

Similar to CEPs, enamel pearls inhibit connective tissue attachment but also retain plaque. They have a predilection for maxillary second and third molars. They are often less than 2 mm in diameter, and rarely contain dentin and/or pulp tissue. Enamel pearls should be removed during treatment.

Conclusion

It is important to identify etiological factors, as they must always be addressed to achieve treatment success and prevent recurrence. Tailored oral hygiene instructions are crucial. Whenever possible, guided tissue regeneration is recommended to restore the lost tissues and improve the affected tooth's prognosis. Perio has come a long way from resecting to regenerating!



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