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White Spot Lesions – A Review Article

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I. Introduction

Demineralization is an inevitable side-effect associated with fixed orthodontic treatment, especially when associated with poor oral hygiene[1]. The clinicians despite modern advances in caries prevention faces great challenge to prevent demineralization[2] WSL develop in association with brackets, bands, arch wires, ligatures and other orthodontic devices that complicate conventional oral hygiene measures, leading to prolonged plaque accumulation[3] The acidic byproducts of the bacteria in plaque are responsible for the subsequent enamel demineralization and formation of WSL. Therefore, orthodontists must take up the active responsibility to educate patients about the importance of maintaining good dietary compliance and excellent oral hygiene regime[2].

Definition

The term WSL was defined as "the first sign of caries like lesion on enamel that can be detected with the naked eye".

The WSL has also been defined as "subsurface enamel porosity from carious demineralization" that presents itself as "a milky white opacity when located on smooth surfaces"[4].

Etiology

The appearance of WSL on the enamel surface during fixed orthodontic treatment is due to a multiplicity of factors. Co-existence of the four factors namely, bacterial plaque, fermentable carbohydrates, a susceptible tooth surface and a sufficient period of time are necessary for WSL to develop[5].

Microbial factors

The presence of *Streptococcus mutans* and *Lactobacillus* and new sites of plaque appearance on the enamel surrounding the orthodontic attachments is common in patients undergoing fixed appliance therapy[6].

Salivary factors

The amount and rate of enamel demineralization and the likelihood of enamel remineralization is influenced by salivary factors such as pH, rate of flow and buffer capacity. Saliva also acts as a vehicle for the delivery of fluoride ions to the enamel and plaque.Tooth surfaces that are more exposed to dietary carbohydrate with less exposure to saliva are common sites for demineralization to occur (maxillary anterior teeth)[7].

Oral hygiene

Fixed orthodontic appliances make tooth cleaning more difficult and also restrict the self-cleansing action of the tongue, lips and cheek to remove food debris from the tooth surface.

Diet

As the frequency of carbohydrate intake increases, rate of enamel demineralization increases.

Prevention of white spot lesions

1. Patient education
2. Fluoride administration
3. Casein phosphopeptide-amorphous calcium phosphate
4. Argon-laser enamel surface attenuation

Primary Prevention of WSL Adjacent to Fixed Appliances

Daily NaF mouth rinses could reduce the occurrence and severity of WSL during orthodontic treatment[8]. A recent study by Al-Mulla et al showed that high sodium fluoride toothpaste (5,000 ppm), available on prescription in some countries, had a greater anti-caries potential than standard 1,450 ppm formula in patients with orthodontic bands[9].

Secondary Prevention (Treatment) of Post-Orthodontic WSL After Debonding

The CPP-ACP studies with Tooth Mousse (GC) or similar products retrieved clinical evidence that daily applications of the remineralizing cream could reverse the severity and visual appearance of post-orthodontic[10]. One study displayed reduced demineralization when ACP was incorporated in the orthodontic Composite[11].

II. Antibacterial Methods

The recent literature has suggested that daily consumption lozenges containing the sugar-substitute xylitol may have a beneficial impact on the ecological environment adjacent to fixed orthodontic brackets[12].

Other Antibacterial

Measures investigated are:

1. Topical Applications Of Chlorhexidine- Varnish
2. Essential Oils
3. Ozone
4. Amorphous Calcium Phosphate And Probiotics

III. Conclusion

Enamel demineralization is a significant risk associated with orthodontic treatment when oral hygiene is poor. this further leads to development of white lesion. This can be prevented by maintain good oral hygiene and using fluoride containing mouthwashes and toothpaste.

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