

HOW TO COMBAT WHITE SPOT LESION IN ORTHODONTIC CASES-REVIEW STUDY

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All over the world fixed orthodontic cases face a common problem –enamel hypoplasia that is white spot lesion. It can be remineralised by brushing with fluoridated toothpaste, fluoride mouth rinses and topical application of fluoride gel/foam. Efficiency of remineralisation is enhanced with daily usage of 0.05%(225ppm) sodium fluoride or 0.2% (900ppm) weekly; or with 0.4% Stannous Fluoride gel. But Stannous Fluoride stains the enamel. Enamel can also be remineralised with casein phosphopeptide-amorphous calcium phosphate (CCP-ACP). Remineralised white spot lesion can be bleached to mask the colour and can be microabraded followed by bleaching leaving a highly polished surface with calcium phosphate packed into the interprismatic enamel surface area.

Key words: White lesion, Enamel Hypoplasia, Remineralisation, Calcium Phosphate, Micro abrasion Stannous Fluoride, Bleaching

INTRODUCTION

Fixed orthodontic treatment even though gives best results for function, esthetics and stability but enamel white spot lesion also go hand in hand. In spite of various methods like brushing, fluoride mouth washes, and topical fluoride applications enamel hypoplasia still surfaces^{1,2,3}. This article briefs about remineralisation of white spot lesion, enamel micro abrasion and bleaching to overcome the discoloration.

Remineralisation

Daily brushing teeth twice daily along with flossing is long known factor for good oral hygiene. Daily use of 0.05%(225ppm)⁴ sodium fluoride mouthwash or weekly use of 0.2%(900ppm) sodium fluoride or 0.4% stannous fluoride gel are really effective in remineralisation. For orthodontic patients 1.23% acidulated phosphate fluoride (APF), 2% sodium fluoride or 8% stannous fluoride can be applied as a preventive measure. Fluoride varnish⁵ is also an effective way

Caesin - Phosphopeptides (CPP)^{6,7,8} are naturally occurring molecules which are able to bind calcium and phosphate ions and stabilize Amorphous Calcium Phosphate (ACP). It adheres easily to soft tissue, pellicle, plaque and even hydroxyapatite. It reacts similar to the mineral/statherin relation in saliva supplying bio available calcium and phosphate required for remineralisation. Even 0.21% w/w sodium fluoride toothpaste and tricalcium phosphate can also be used.

Next factor is the fluoride releasing luting cements. Glass ionomer cements and resin modified glass ionomer

cements are effective in inhibiting demineralization by releasing high fluoride ions adjacent to orthodontic bands^{9,10,11,12,13}.

Microabrasion

After debonding, white spots are found at the gingival margins where composite used for bonding remains and at the palatal areas of bands which is neglected by the patient during routine brushing technique. During remineralisation, fluoride, calcium and phosphate ions penetrate the surface area and precipitate on sound enamel. The lesion becomes smaller with the center of the subsurface enamel being the final area to remineralise. This process creates a highly dense compaction of calcium, phosphate and fluoride, which has more mineral content than the natural enamel and is more difficult to demineralize than the natural enamel¹⁴. It appears bright white than the normal enamel. After debanding the appliance, 15 to 30 days regimen of topical fluoride can minimize white spot lesion, decreasing lesion size, which increase surface zone depth¹⁵. Use of quantitative light fluorescence (QLF) systems have demonstrated that enamel remineralisation can be followed.

If white spot still remains even after this procedure, micro abrasion is the treatment of choice. It is merely the application of an acidic and abrasive compound to the surface of the enamel^{16,17}. Research indicates that 1 minute application removes 12 micrometre on the first application and 26 micrometre on subsequent application¹⁸. Difference in abrasion is due to fluoride rich enamel on the surface. Usually, 5 to 10 applications of

microabrasion compound indicates whether the technique will be successful in adequately eliminating the discoloration. The microabrasion process removes the small amount of surface enamel but leaves a highly polished surface. This highly polished surface has no interprismatic structure. This procedure compacts calcium and phosphate into the interprismatic spaces. Research has demonstrated that although microabrasion removes small amount of the enamel surface, the new polished surface is less susceptible to bacterial colonization and demineralization than naturally abraded teeth. Following this procedure, 4 minute 2% sodium fluoride application is recommended. If results are not satisfactory the bleaching of the teeth is the option.

Vital Tooth Bleaching

Patients with stains after orthodontic treatment are benefitted with bleaching. Mild whitened enamel can be benefitted with standard tray based whitening system or with hydrogen peroxide- impregnated polyethylene strips²⁰. If 2 to 4 week bleaching with this is not successful then microabrasion followed by bleaching is recommended.

CONCLUSION

Prevention is most important in preventing the enamel demineralization. Regular brushing, fluoride mouth wash, professional application of fluoride varnish or foam is really helpful. Even casein phosphopeptide-amorphous calcium phosphate has given good results.

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