

Icon Treatment For Orthodontic Treatment Induced White-Spot Lesions: A Case Report

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Abstract: White Spot lesions develop on the tooth surface due to prolonged plaque accumulation which leads to demineralization of tooth surface. The most common primary cause of white spot lesions is fixed Orthodontic treatment. It is especially seen in patients who fail to maintain good oral hygiene. Also such lesions have to be differentiated from the cavitated or non-carious lesion on the tooth surface. Patients undergoing fixed orthodontic treatment having High DMFS Index, frequent and high carbohydrate intake and poor oral hygiene have higher chances of developing white spot lesions. Over a period of years, multiple strategies have been introduced and implemented in treating such non carious white spot lesions. Treatment varies from minimal invasive like Topical Flouride application or mouth rinse, use of chorhexidine mouth wash, Xylitol chewing gum or use of CPP-APP; to the most aggressive options like veneers or full coverage crowns depending on the lesion and its demineralization. White spot lesions which are within the enamel and or slightly involving dentin can be treated in the best way through ICON-DMG Material. This product has unique ingredients as etchant- Hydrochloric acid, Pyrogenic Silicic acid, Surface-active substances, drying agent-99% ethanol and Resin infiltrant- Methacrylate resin matrix, initiators and additives. This unique system restores the structural, Functional and aesthetic aspects of affected teeth. Over a period of years many research has been done on it and it stands out every single time as the best treatment approach of such white spot lesions.

Key words: White spot lesions, Fixed orthodontic treatment, esthetics

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I. Introduction:

Multiple treatment options are available for treating the white spot lesions on teeth surface(1). Such lesions can develop either due to orthodontic treatment or various factors like diet, oral hygiene methods or developmental anomalies(1-3). Of these, the most common reason for white spot lesions is long duration of fixed orthodontic therapy(1-3). This alone or orthodontic treatment in conjunction with poor oral hygiene and improper dietary habits can also be the etiological factors. The basic mechanism for development of such lesion is demineralization of tooth surface. Also this lesion has to be differentiated from the cavitated or carious lesion on the tooth surface. Patients undergoing fixed orthodontic treatment having High DMFS Index, frequent and high carbohydrate intake as well as poor oral hygiene are at a greater risk of developing white spot lesions(1-3). Over a period of years multiple strategies have been put forward and implemented in treating non carious white spot lesions. Treatments ranging from minimally extensive interventions such as Topical Flouride application or mouth rinse, use of chorhexidine mouth wash, Xylitol chewing gum or use of CPP-APP; to the most aggressive options like veneers or full coverage crowns depending on the lesion and its demineralization(4-8). This unique product ICON-DMG is an excellent way of treating such early and less invasive demineralized lesions on tooth surface(9). The one of its kind ingredients and suspending method allows treating such lesions in the most efficient and minimally invasive way. The results achieved have a good prognosis. Moreover, in this case report, we present an option that is more affordable and more accepted by patients because the cost of treatment is significantly reduced with negligible reduction of tooth structure.

II. Case-report:

A 25 year old female patient, who had previously undergone fixed orthodontic treatment for 2 years and had completed the treatment six months prior (orthodontic brackets were taken off) to the dental office visit

presented to the dental office in Mumbai, India with a chief complaint of white spots on her upper four front teeth(maxillary central and lateral teeth). Clinically, the white spot lesions(See figure 1) were exactly at the precise areas surrounding where the braces were previously bonded. Because of the history of fixed orthodontic treatment and lesions present on the localized regions, they were differentiated from Fluorosis, developmental enamel hypomineralization and enamel hypoplasia. The later three abnormalities have genetic and environmental bases and are present on the entire tooth surface. Furthermore, the involved lesion was clinically evaluated by thoroughly drying the surface with a three way syringe and cotton, thereafter which the lesion was gently evaluated with a periodontal probe to check if the lesion contained any sort of decay. The lesion was finally diagnosed as a non-cariious white spot lesion developed secondary to orthodontic treatment. The patient was informed regarding the several treatment options such as fluoride treatment, veneers or getting treatment by ICON-DMG, along with their accompanying advantages and disadvantages. Finally, the patient chose to undergo treatment by ICON(DMG,America) since it was less expensive and minimally invasive in comparison to veneers and more effective than fluoride treatment. After the informed consent was obtained, the procedure involved cleaning the teeth surface of any plaque as well as a routine full mouth scaling. The teeth to be treated were teeth number 7,8,9 and 10. Post this, cotton rolls were placed in the labial vestibule and continuous high volume suction was carried out by the chair side dental assistant. Etchant was liberally applied onto each lesion separately and let to sit there for 2 mins (See figure 2). Here, the etchant was applied atleast 2mm beyond the margin of each lesion. Etchant was washed for 30 seconds and dried with cotton and Oil-water free air. Ethanol dry was used on the tooth, to check if lesion had become less. Since the braces debonding was done more than 2 months prior, the etching process was performed twice .Mylar strips were placed between 5,6,7,8,9,10 and 11.It was then light cured for 40 Seconds, following the application of the Icon-Infiltrant(DMG, America) (See figure 4) which was then let to sit for a minute and light cured for 40 seconds(See figure 4). The Mylar strips were then removed and polishing cups were used for surface finishing in order to render an aesthetic look to the restoration (See figure 5).



Figure 1: Presence of the white spot lesions secondary to orthodontic treatment



Figure 2: Placement of etchant



Figure 3: Placement of icon infiltrant



Figure 4: Light curing of the icon infiltrant.



Figure 5: Post-operative view post polishing.

III. Discussion:

Veneers and full coverage crowns are considered as the most aesthetic treatment option for treating any shade or shape related defects for teeth coming under smile. However, depending upon the actual lesion or defect and patients aesthetic demands, a mutual option has to be decided and worked upon. For white spot

lesions like Fluorosis or enamel Hypoplasia the best treatment option, without any doubt, would be veneers or full coverage crowns. However, for white spot lesion secondary to fixed orthodontic treatment less invasive options like use of topical fluorides or chlorhexidine mouth wash or CPP-ACP can also be used. Basically the later three options works on the basic logic of remineralizing the already demineralized enamel. However certain drawbacks are associated with the above mentioned options. Flouride exposure via mouthwash does help in remineralization but not much research has been done on that. Also high concentration of fluoride can lead to staining. Chlorhexidine mouthwash leads to change in bacterial biofilm in oral cavity from unfavourable to favourable. Also it has demineralizing – inhibiting effect when used in conjunction to Flouride treatment. However, it possesses the biggest disadvantage that it stains the tooth when used for long duration of time. The use of CPP-ACP might prevent demineralization on enamel but there is limited clinical trail evidence and plus since it is milk product, it cannot be used in Lactose intolerant people. Bleaching of teeth is also one of the options but it has drawback that it reduces the microhardness of the sound and demineralized enamel. Ideally, it is advisable to allow the remineralization of teeth naturally. If after few weeks of debonding the lesion still persists, other treatment alternatives should be decided upon depending on the lesion. Also to begin with the treatment should start with conjoint use of high fluoride (50000ppm) use with 0.12% chlorhexidine mouthwash. Patient should be evaluated constantly after few weeks. If satisfactory results are not obtained, one should think of other treatment alternatives.

With regard to this case, the patient insisted on an instant, more aesthetic, less invasive and affordable option, which could be fulfilled with the use of ICON(9). In our study, the ICON provided excellent results with good coverage of the white spots, which was in conjunction with other studies published in literature(9-16). Icon works by utilizing an innovative caries infiltration concept, wherein the special etch opens the surface layer and microporosities(9). After desiccating the lesion, capillary forces draw the resin infiltrate into the resulting voids. The light cured resin forms a permanent seal, starving the bacteria in the tooth structure from substrate and hereby preventing the progression of the lesion, thus making it an ideal treatment option for orthodontics treatment induced white spots.

IV. Conclusion:

Keeping up with the current scenario and pace of life, ICON-DMG appears to be an ideal choice of treatment owing to its minimally invasive technique, cost effectiveness and immediate results post treatment.

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