

INTRODUCTION

White spot lesions (WSLs) are observed commonly in dentistry. These initial signs of demineralization can occur from a variety of causes. Carious demineralization result in incipient white lesions which indicates breakdown of enamel from bacterial causes. Other causes can be congenital such as those born with hypomaturation/ enamel hypoplasia as well as hypomineralization. Other environmental conditions such as fluorosis can cause the appearance of white spots. WSLs are also commonly seen after bracket removal in orthodontic patients mainly on the facial surfaces of anterior teeth. Recently, a new method has been discovered in Germany in order to combat these WSLs. The Resin Infiltration System is a fairly new, yet highly effective system used to treat white spots without causing harm or undermining the quality and strength of the enamel.

White Spot Lesions



What is the ICON Resin Infiltration System?

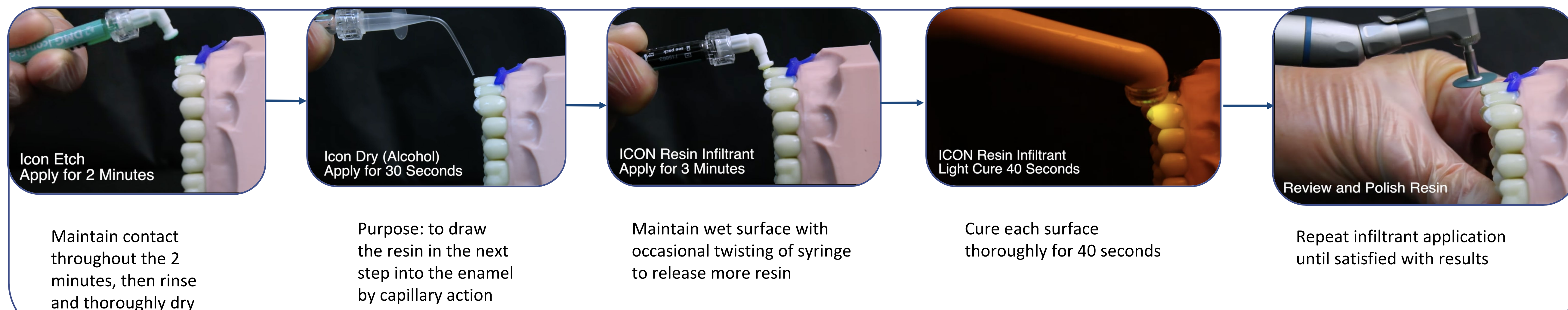
- The ICON treatment system is a new innovative way to significantly reduce and sometimes even eliminate white spot lesions on dental enamel.
- This system can show results in one visit, as opposed to other treatment options such as fluoride which take more time for the effects to be observed.
- Minimally invasive restorative treatment for white spot lesions that are left behind after orthodontic treatment, or certain congenital hypocalcified enamel lesions
- Can also be used for incipient caries and areas of demineralization
- It is a repetitive process of etching, drying, and placing resin onto a white spot lesion in order to reduce its appearance



How does it work?

- Tooth/teeth must be thoroughly cleaned with pumice, with no traces of plaque
- 15% HF acid is then applied to the lesion for 3 minutes- extend 2mm around the edges of the lesion, this removes the smear layer, opens enamel tubules and roughens the surface microscopically
- Icon-Dry (ethanol) is used to fully dry out the enamel tubules to allow to better penetration of the resin
- Icon- Infiltrant, which is an unfilled resin, is applied for 3 minutes and cured. Icon- Infiltrant is applied again for 1 minute to increase enamel hardness. This can be repeated until the desired results are achieved.
- Once the resin is applied and cured, the microporosities are occluded which helps prevent demineralization
- The WSL appearance is reduced by decreasing the amount of light scatter that is created and this is achieved through a proper resin material with a good color match.
- the refraction index of the resin infiltrant is similar to that of enamel which is how the WSL seems to have "disappeared"

Steps



Study- "Infiltration Therapy - an Alternative to Fluoride Varnish Application for Treatment of White Spot Lesion After Fixed Orthodontic Treatment"

Purpose: to monitor the evolution of the white spots lesion (WSL) arising during fixed orthodontic treatment, during a period of 6 months after debonding of the brackets

Methods:

- 62 patients with WSL's (post orthodontic treatment) were randomly divided into 3 groups
- Patients were between the ages of 13-22
- Each group received a different therapeutic agent (**topical fluoride varnish**, no special treatment just **brushing 2x a day** and **resin infiltration**)
- The white spot lesions were observed during 3 intervals : Immediately after bracket removal, 3 months after, 6 months after
- Since the resin infiltration system had immediate effects, the results were checked only immediately after bracket removal

RESULTS



In groups 1 (fluoride varnish) and 2 (brushing), there were decreases in the appearance of WSLs, with Fluoride varnish having a greater difference and therefore was deemed more effective than just brushing, however it was not as effective as the Resin infiltration system, which significantly reduced the appearance of the WSLs as shown above

Conclusion/Discussion

- There are different treatment options for patients that want to take care of their white spot lesions
- ICON Resin Infiltration System has introduced a new way of reducing the appearance of these WSLs through a process of etching and bonding which dentists are familiar with
- Results using the ICON system happen in one visit, which may encourage a lot of patients to choose this treatment
- The ICON system eliminates the need for patient compliance, making it a very advantageous option
- Studies have shown that the enamel hardness was not significantly affected, and in fact, enamel hardness in those with sealants was much lower than those who had ICON resin infiltration teeth
- The deeper penetration of the resin due to the extensive etching process helps increase the esthetic results and aid in masking the white spot lesions, as opposed to just whitening the teeth and hoping that the contrast would not be as drastic
- limitations of this system include sensitivity due to the higher acidic content of the etch and the porosities created to allow for resin penetration

References

- Jumanca, D., Galuscan, A., Podariu, A. C., Ardelean, L., & Rusu, L. C. (2012). Infiltration Therapy - an Alternative to Fluoride Varnish Application for Treatment of White Spot Lesion After Fixed Orthodontic Treatment. *Revista De Chimie*, 63(8), 783-786. Retrieved from <http://revistadechimie.ro/pdf/JUMANCA D.pdf> 8 12.pdf
- Mazur, M., Westland, S., Guerra, F., Corridore, D., Vichi, M., Maruotti, A., ... Ottolenghi, L. (2018). Objective and subjective aesthetic performance of icon® treatment for enamel hypomineralization lesions in young adolescents: A retrospective single center study. *Journal of Dentistry*, 68, 104-108. doi: 10.1016/j.jdent.2017.11.001
- Phark JH, Duarte S. Clinical performance and color stability of infiltrated smooth surface lesions. 2010, Data on file. DMG, Hamburg. Germany.
- Taher, N. M., Alkhamis, H. A., & Dowaidi, S. M. (2012). The influence of resin infiltration system on enamel microhardness and surface roughness: An in vitro study. *The Saudi Dental Journal*, 24, 79-84. Retrieved from <https://www.journals.elsevier.com/saudi-dental-journal/>