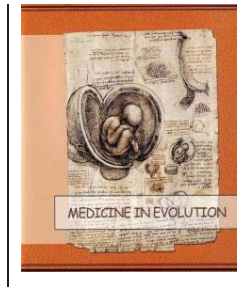


# Treatment of white spot lesions by resin infiltration



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## **Abstract**

If the tooth decay is not identified in its early stages, the restoration treatment may require complex methods of treatment which weakens the teeth and therefore the long-term prognosis of the tooth. Icon represents a relatively new product, with micro-invasive technology, whereby dental treatments can be applied without requiring anaesthesia. The purpose of this trial is to verify the effectiveness in the treatment of white spot lesions which appear following a fixed orthodontic treatment, with the help of ICON. The clinical trial was conducted for 4 months and included a group of 8 patients, i.e. 4 women and 4 men aged 19-30, from Timisoara municipality. The persons enrolled in the clinical trial have chalky white spots (demineralisations) identified after removal of brackets, located on the vestibular surfaces of the teeth.

**Keywords:** early caries lesion, demineralisation, chalky white spot, infiltrate

## INTRODUCTION

Cariou lesion is the cumulative “cariou processes affecting the imbalance between calcium and phosphate ions in the dental tissue and saliva, mediated by dental plaque microorganisms and influenced by certain factors (fluorine)” [1]. At global level, “60-90% of young children and nearly 100% of the adult population suffer from various diseases related to the oral cavity” [2].

However, in the past years, the progress of early lesions seems to be slower [2], allowing the implementation of certain preventive strategies which impede their progress. Traditional method together with new methods can enhance the diagnosis of caries and help the dentist to better monitor the micro-invasive treatment [1].

There are cases where plaque accumulation can be favoured even at persons with good oral hygiene. The components of a fixed orthodontic appliance do not only align the teeth, they also influence the oral cavity by changing the microbial flora and by creating new gaps for plaque and food accumulation [3].

In the absence of a proper treatment, the evolution of tooth decay is progressive and cumulative. If the tooth decay is not identified in its early stages, the restoration treatment may require complex methods of treatment which weakens the teeth and therefore the long-term prognosis of the tooth. Icon represents a relatively new product, with micro-invasive technology, whereby dental treatments can be applied without requiring anaesthesia.

### *Aim and objectives*

The purpose of this trial is to verify the effectiveness in the treatment of white spot lesions which appear following a fixed orthodontic treatment, with the help of ICON.

## MATERIAL AND METHODS

The clinical trial was conducted for 4 months and included a group of 8 patients, i.e. 4 women and 4 men aged 19-30, from Timisoara municipality. The persons enrolled in the clinical trial have chalky white spots (demineralisations) identified after removal of brackets, located on the vestibular surfaces of the teeth. The trial was conducted in compliance with the ethical requirements for obtaining the written consent of all persons enrolled in the trial.

Icon is a product which makes the treatment of early white spots simple, painless, without affecting the healthy tissues and which requires no anaesthesia. For application of Icon, the protocol indicated by the manufacturer was observed, namely: Sanitise. Apply rubber dam; Apply Icon-Etch. Allow to work for 2 minutes; Rinse with water, 30 seconds. Dry with oil and dry air spray; Apply Icon-Dry. Allow to work for 30 seconds; check the tooth appearance (white spots should be significantly reduced when applying Icon-Dry; otherwise, steps 2-4 must be repeated, not more than 2 reps); Dry with oil and dry air spray; Apply Icon infiltrant. Allow to work for 3 minutes. Maintain the humidity of the surface treated; Air and dental floss dispersion. Photo-polymerisation lamp 40 seconds, Replace the applicator tip. Apply Icon infiltrant. Allow to work for 1 minute. Remove excess and use dental floss. Photo-polymerisation lamp 40 seconds. Polish.

## RESULTS

Below we will present a few relevant photos to prove the efficiency of using the infiltrant on chalky white spots:

The first case presented is a 28 years old woman who developed chalky white spots on 3.4 and 3.5 premolars. Given that after the first application of the infiltrant spots were still

visible, a second application was required. At the end of the treatment, white spots fully disappeared as shown in the following figure.

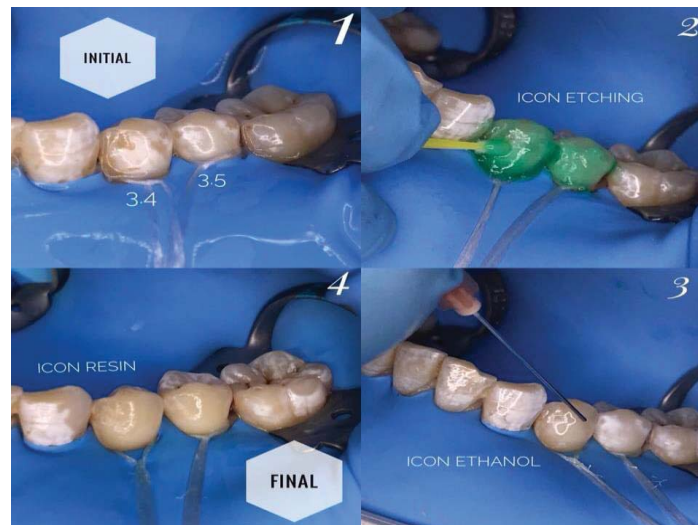


Figure 1. Stages of Icon treatment at the first patient

The second case presented is a 22 years old man. In his case, white spots were identified on teeth 1.1, 1.2, 1.3, 2.1, 2.2. Chalky white spots were successfully removed at the end of the treatment, and the patient's teeth had a healthy and nice aesthetic appearance. The second application was not required in this case.



Figure 2. Areas which require the application of infiltrant and final results

The third case which we chose to present is the case of a 25 years old woman. Her teeth had demineralisations on the vestibular surfaces of all front teeth. The results were excellent also in this case.



Figure 3. Initial and final appearance of the case

All patients who participated in this clinical trial had optimal results following the Icon treatment, and white spots fully disappeared in most of the cases.

Three out of eight patients who participated in the trial had minimum plaque deposits due to a rigorous oral hygiene. They brush their teeth at least twice a day, use mouthwash and dental floss and have regular medical checks. Patients 3 and 7 mentioned that they

included tooth brushing in their daily routine, but they do not use dental floss or mouthwash. Plaque deposits were large enough in their cases, which led to the formation of white spots on the teeth surface. Patients 1, 2 and 4 have a poor oral hygiene. They do not brush their teeth on a regular basis, never or rarely used additional oral hygiene products and do not have regular dental checks. Such patients had huge plaque deposits. In case of patients 1, 2, 3, 4 and 7 white spots appeared due to a poor oral hygiene, and for convenience they do not include dental care in their daily routine. Patients 5 and 6 have a proper oral hygiene, using all products intended for dental care, but their nutrition include unhealthy food based on many products containing sugar and fizzy drinks this being the main reason which led to the appearance of white spots. Patient 8 was the only person fully observing the dental care rules, always paying attention to her nutrition and having a proper oral hygiene. In her case, white spots appeared due to the lack of calcium.

All patients mentioned that they were not aware of this type of treatment until they were selected to participate in this clinical trial. They found the procedure as being effective and were very satisfied with the final results. From their perspective, the greatest benefit of this treatment is the lack of pain and anaesthesia. They were also happy about their problems being treated very fast, so they did not need a second visit to the dental practice for the same procedure.

## DISCUSSIONS

An undesirable effect of the treatment using orthodontic brackets is the impact on the oral cavity by means of several actions: accumulation of dental plaque, which leads to the development of white spot lesions, demineralization of the enamel, change of the oral flora, including changes at gingival level (gingivitis in certain cases, even periodontitis), lesions of the oral mucosa, modifications of the bone and muscular structure movements due to the diet and, last but not least, psychological changes [4-6].

Chalky white spots caused by the teeth demineralisation during fixed orthodontic treatment must be treated even if they do not cause discomfort or pain. They are caused by the demineralisation of the tooth enamel both outside as well as inside the tooth. This type of disease can be easily treated since it is a reversible process which does not form cavities. White spots should be treated as soon as possible, immediately after they appeared on the teeth surface, if possible. If they are ignored and not treated, such spots can develop and cause the destruction of the tooth enamel thus leading to carious lesions.

Icon is considered the best treatment method, by infiltration, against white spots (demineralisation). This type of treatment offers better results than previously used remineralisation methods. It is far more effective in removing white spots than other remineralisation methods that use other types of chemical agents and that have a longer action time. If used in time, Icon prevents the formation of carious lesions due to the fact that fully repairs the tooth enamel. The infiltrating agent penetrates deeply into the demineralised enamel and restores its structure from depth to surface.

During the clinical trial conducted we used Icon DMG package containing infiltrating solutions and interproximal applicators for each patient. The package includes all items necessary to perform the treatment, except for the rubber dam. The application instructions of such technique were fully observed in order to get optimal results, and patients were satisfied with their choice. Patients were given detailed explanations of the procedure to be applied. They were informed of the benefits provided by this type of treatment and the steps to be followed after its completion in order to maintain the results obtained and to prevent other dental issues.

For optimal results, the first step of the Icon treatment applied to patients within this clinical trial consisted of the professional sanitisation of oral cavity. Then all steps indicated by the manufacturer must be fully observed.

## CONCLUSIONS

Chalky white spots on teeth surface appear after teething due to demineralisation of enamel for various reasons. The failure to treat such spots may lead to carious lesions.

The best method for the treatment of chalky white spots is using the resin infiltration method which restores both the aesthetic appearance as well as the porous structure of the enamel while protecting the tooth against further acid attack. Besides being effective, such treatment is also painless, non-invasive and requires a single visit to the dentist.

## REFERENCES

1. Featherstone JD. Dental caries: a dynamic disease process, *Aust Dent J* 2008: 286-291.
2. Nyvad B. Diagnosis versus detection of caries. *Caries research*. 2004;38(3):192-198.
3. Matichescu A., Jumanca D., Podariu A.C., Gaľuşcan A. White Spot Lesions - Consequences Of Fixed Orthodontic Treatments. *International Journal of Medical Dentistry*. volume 22 • Issue 3 July / September 2018 • pp. 257-262
4. Tufekci E, Dixon JS, Gunsolley JC, Lindauer SJ. Prevalence of white spot lesions during orthodontic treatment with fixed appliances. *Angle Orthod*. 2011;81(2):206-10.
5. Zotti F, Dalessandri D, Salgarello S, Piancino M, Bonetti S, Visconti L, Paganelli C. Usefulness of an app in improving oral hygiene compliance in adolescent orthodontic patients. *Angle Orthod*. 2016;86(1):101-7.
6. Jumanca D, Galuscan A, Podariu CA, Ardelean L, Rusu LC. Infiltration therapy - an alternative to flouride varnish application for treatment of white spot lesion after fixed orthodontic treatment. *Rev. Chim. (Bucharest)*. 2012;63(8):783-6.
7. Li X, Wang J, Joiner A, Chang J. The remineralisation of enamel: a review of the literature, *J Dent* 2014: 12-20.