Non Invasive Management of White Spot Lesions

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Introduction

Enamel decalcification

White spot lesions (WSLs)

"white opacity," occur as a result of subsurface enamel demineralization that is located on smooth surfaces of teeth.

Organic acids produced by bacteria enter interprismatic spaces in tooth enamel, resulting in (WSLs).

Etiology of WSLs

1. Poor oral hygiene (plaque accumulation on the affected teeth surface, commonly due to inadequate oral hygiene in orthodontic treatment.
2. Acid-producing bacteria.
3. Many host factors(low salivary volume, sugary diet, fermentable carbohydrates).

The other important factors that impact this process are:

Patient's modifying factors:

- **medical history**
- **dental history**
- **medication history.**
- **levels of calcium, phosphate, and bicarbonate and fluoride in saliva.**
- **genetic susceptibility.**

The goal of modern dentistry

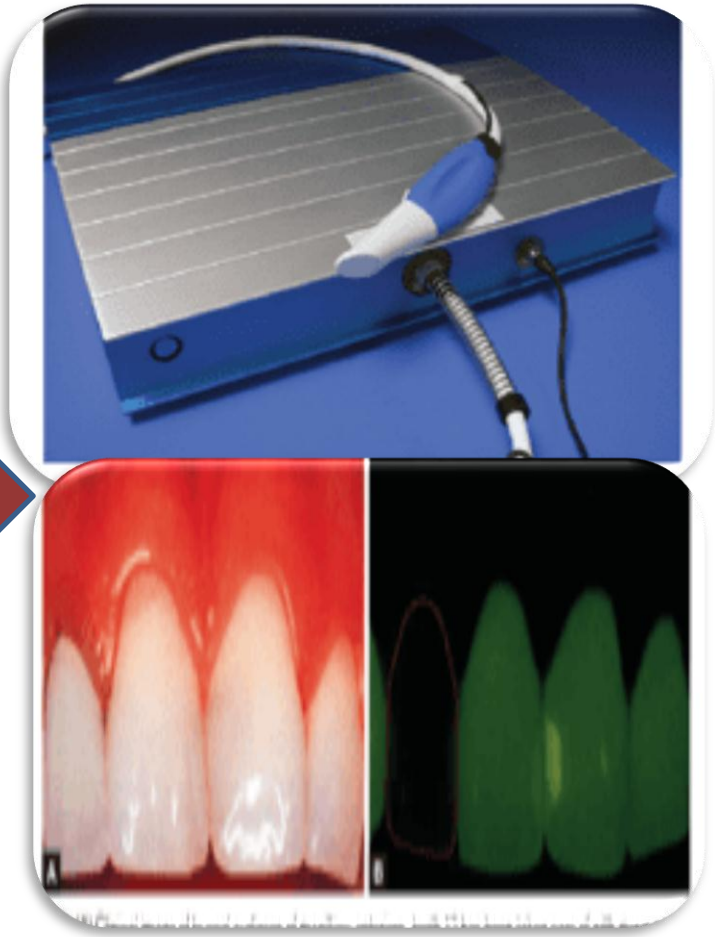
Determine all the risk factors and preventive measures by understanding all mechanisms responsible for demineralization leading to WSLs in order to intervene non-invasively and improve the strength, esthetics, and functions of teeth.

Diagnosis of WSLs

1. Visual inspection

2. Fibre-optic trans illumination of teeth, simple, well tolerated by patients and offers a non-invasive . Employing near-infrared wavelengths of light have permit the capture of trans illumination images less confounded by extrinsic staining and with increased penetration into the tooth structure.

3. **Quantitative light-induced fluorescence (QLF) use the natural fluorescence that occurs in tooth enamel.** In demineralized foci, a decrease is detected in this natural fluorescence and is seen as darker areas.



Laser fluorescence DIGNOdent

Differential diagnosis of white spot lesions

- Dental fluorosis.
- Traumatic hypomineralization.
- Molar-Incisor Hypomineralization MIH.
- Genetic defects causing enamel hypoplasia (Amelogenesis Imperfecta).

How to diagnose white spot lesions ?

- ✓ WSLs appear translucent when the surface is moist, and opaque-white when the surface is dried with air spray. While
- ✓ Other hypomineralized lesions are often opaque white when the surface is moist.
- ✓ The surface of WSLs is softer and rougher, and dental plaque accumulation is often observed in these areas.

Management of white spot lesions

1. **Good oral hygiene.**
2. **Application of Fluoride.**
3. **Chlorhexidine.**

3. Calcium-phosphate-based delivery systems

A. **Casein phosphopeptide - Amorphous calcium phosphate(CPP-ACP) is a bioactive agent with a base of milk products able to bind calcium and phosphate ions to stabilize and increase the calcium phosphate in dental plaque.**

B. **CPP-ACP also adheres to hydroxyapatite.**

C. **Supplies free calcium and phosphate ion.**

helping to reducing demineralization and promote remineralization by reforming into calcium phosphate crystals.

5. Laser

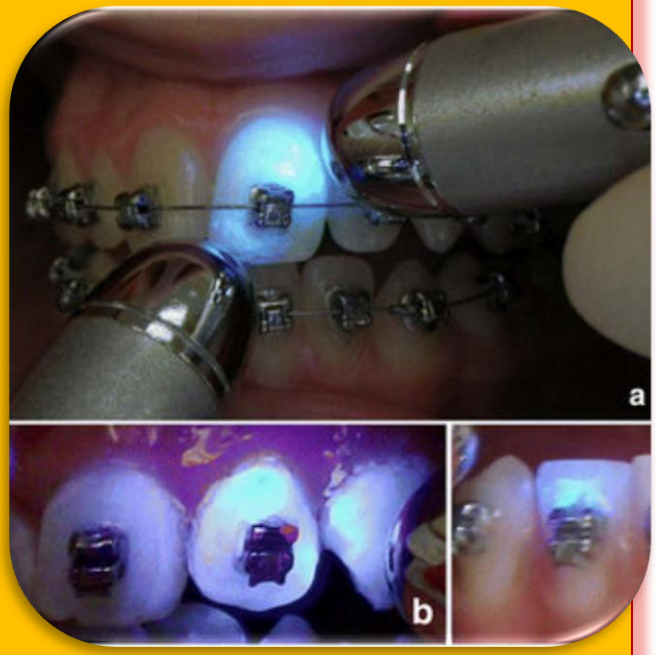
- **Decreased enamel permeability, the solubility.**
- **alterations in the chemical composition and surface morphology for increased acid resistance of enamel exposed by laser irradiation.**

prevent demineralization

6. Probiotics

Antibacterial, probiotics may have a positive effect on reducing the mutans streptococci counts.

7. Sealants applications to the enamel surfaces adjacent to orthodontic brackets during orthodontic treatment to form a physical barrier for acidic conditions.



8. Tooth bleaching agents

It is a minimal invasive conservative approach and provides a more uniform appearance, but the most important reason for not having a wide use is that *microhardness of sound and demineralized enamel surfaces may decrease after bleaching treatment,Therefore, the risk of developing caries increases*

9. Microabrasion

This treatment can improve enamel surface texture, remineralization and eliminate supericial staining or defects .

This technique includes **mixture of 18% hydrochloric acid (HCl) and medium grained pumice** application to the enamel, which removes approximately 100 μ from the surface layer.

The structure of this microabraded enamel surface appears polished because of no interprismatic space and it is more resistant to ba
demineralization

10.Resin iniltration

The basic principle of this technique:
inhibition of lesion progression by blockage of micropores that provide a diffusion pathway for acids by using resin. Resin infiltrants can only fill microcavities. It technique is an effective method as it slows or prevents the progression of lesions
ICON is used effectively in treatment of white spot lesion





conclusion

- **Oral hygiene motivation, topical fluoride agents, casein phosphopeptide-amorfus calcium phosphate agents, antimicrobial agents, tooth bleaching, microabrasion and resin infiltration are the current options for prevention and treatment of white enamel lesions.**
- **Reducing the risk of lesion formation by using these methods and early treatment with the appropriate technique is recommended to obtain healthier and more aesthetic results.**
- **Future innovations in this field may bring up more treatment options of white spot lesions.**


Thank you for kind listening
Any Question?