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Resin infiltration

A NOVEL METHOD FOR ULTRA CONSERVATIVE CORRECTION OF HYPOMINERALISED LESIONS



Figure /1 Pre-operative smile view showing hypomineralized lesions predominantly affecting teeth 14, 13, 11, 21, 22.



Figure /2 Post-operative reassessment smile view showing significant esthetic improvement.

White spot lesions pose a restorative challenge no matter what angle you view them from. White spot lesions may occur as part of molar-incisor hypomineralization (MIH), which is a condition that is phenotypically expressed as defined areas of opaque enamel. The color of affected enamel can range from stark-white transitioning to yellow through to creamy brown. MIH lesions are typically differentiated from fluorotic lesions in that the latter tend to be more diffuse in appearance.

Historically, treatment has taken many forms, ranging from conservative through to aggressive. For white lesions with an intact surface, microabrasion is a common technique characterized by typically etching with 33% H_3PO_4 (aq) for 30 seconds before abrading the surfaces with a flour-of-pumice slurry in a prophy cup followed by the application of a 'remineralising' agent; I use GC ToothMousse. I would dismiss the patient and instruct them to apply ToothMousse twice a day for 5 minutes each time. I typically repeat this procedure every 2 weeks for about 5 cycles. This typically achieves

an improved esthetic outcome and a remineralized lesion.

Larger lesions that involve the enamel surface are often characterized by a matrix rich in organic substance. Bonding is optimal to inorganic tissue, and thus for lesions that are cavitated as well as discoloured in nature, macroabrasion or macroreduction is often necessary to produce an acceptable base for adhesive bonding and subsequent esthetic layering.

This 'Blog' addresses a novel technique whereby intact enamel lesions of significant prominence may be treated ultra-conservatively, often with no need for subsequent resin layering for esthetic obscuration.

Shivanna and Shivakumar (2011) describe a technique for treating white spot lesions whereas the intercrystalline spaces are permeated by a low-viscosity resin.¹ For teeth requiring resin layering, Wiegand *et al* (2011) demonstrate the possibility of enhanced adhesion to teeth affected by post-eruptive enamel breakdown that were infiltrated with resin prior to restoration.²

Procedure

PRESENTATION

This 59 year old female patient presented wanting to lighten the base color of her teeth and removing the unsightly white patch lesions. With the exception of hypomineralized enamel lesions affecting teeth 15 to 25, congenitally-missing maxillary lateral incisors and possible ankylosis of her 13 she had a healthy, caries-free dentition.

TREATMENT

The treatment plan consisted of fabricated laboratory-made custom bleaching trays with a focus on cervical margin seal precision, and the use of 10% carbamide peroxide (Opalescence) overnight for 7-21 nights until an acceptable base shade was achieved. Following successful bleaching, the lesions were addressed next. The maxillary teeth were isolated from 16 to 26 using rubber dam and ligatures secured around individual teeth. The lesions were treated for 2 minutes using 10%



hydrochloric acid before drying fully with oil-free air. Ethanol (Icon-Dry) was then applied and scrubbed into the lesions for 1 minute. The lesions were treated with the hydrochloric acid - ethanol cycle for 4 consecutive cycles where a visible diffusion of the lesion indicated the surface has been adequately prepared for infiltration. Typically 2-3 cycles is considered normal – this case required an additional cycle. Resin infiltration was then completed via scrubbing with unfilled resin (DMG Icon) allowing this to 'dwell' for 3 minutes before scrubbing again with fresh resin, allowing a further 3 minute dwell prior to air thinning and curing. Resin infiltration was undertaken again by scrubbing and dwelling over an additional 3 minute cycle before air thinning and curing. The oxygen inhibition layer was removed via placement of a glycerin layer (Liquid Strip, Ivoclar Vivadent) and curing. The contacts were flossed and the result reviewed to our satisfaction.

This resin-infiltration technique provides patients with a 'nearly a no-drill' solution. Situations requiring further resin layering are also made less complex by pre-restorative resin infiltration, providing a base more amenable to esthetic coverage and featuring enhanced adhesion. 

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Clarence is originally from Toronto, Canada, where she completed her Doctor of Dental Surgery and General Practice Residency at the University of Western Ontario and the University of Toronto, respectively. Clarence's practice is mostly limited to cosmetic and restorative dentistry. She is well-published to both the local and international dental press, writing articles, reviewing and developing prototype products and techniques in clinical dentistry. She frequently and continually lectures throughout New Zealand and Australia.

Clarence is the Chairperson of the New Zealand Academy of Cosmetic Dentistry. She is an Accreditation Candidate and Sustaining Member of the American Academy of Cosmetic Dentistry and seeks to be the first in New Zealand and Australia to gain Accredited Status with them. Clarence is an Opinion Leader for Henry Schein Shalfoon, 3M ESPE, Kuraray-Morita, GC Australasia, SDI, Coltene-Whaledent, Dentsply/Triodent/Rhodium and a Voco Fellow in Australasia.

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REFERENCES

1. Shivanna V, Shivakumar B. Novel Treatment of white spot lesions: A report of two cases. *J Conserv Dent.* 2011, 14(4):423-426.
2. Wiegand A, Stawarczyk B, Kolakovic M, Hammerle CHF, Attin T, Schmidlin PR. Adhesive performance of a caries infiltrant on sound and demineralised enamel. *J Dent* 2011; 39: 117-121.



Figure /13 Rubber dam isolation with ligature ties. Note: 10% HCl (aq) interacts harshly with the Coltene Roeko Extra-Thin Dam - it virtually starts to melt even with copious water lavage. Use IsoDam or Latex as an alternative.



Figure /14 Cross-polarized shot of application of 10% HCl (aq) to lesions of interest (Polar Eyes).



Figure /15 Application of Icon Dry (ethanol) to lesions of interest for 1 minute after etching.



Figure /16 Cross-polarized view of post-operative reassessment showing significant infiltration of lesions resulting in improved esthetics.

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