COMMENTARY

Alternative Esthetic Management of Fluorosis and Hypoplasia Stains: Blending Effect Obtained with Resin Infiltration Techniques¹

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Enamel white spots appear on natural teeth in various degrees of demineralization, opacity, and characteristic patterns that may be an esthetic problem for some patients. Research indicates that at least one enamel white spot is expected to occur for 73% of patients undergoing orthodontic treatment.² Often, treatment for white-spot lesions is approached like other forms of smooth surface caries using high concentrations of fluoride (greater than or equal to 5,000 ppm) to induce a rapid remineralization of the superficial enamel. The rapid remineralization of superficial enamel can impede the remineralization of the deeper layer of the lesions resulting in white-spot scars or enamel opacities that will not return to the natural opalescence of sound enamel.

When possible, prevention is always the best approach in treating white-spot lesions. A recent clinical trial by Robertson and colleagues has shown successful prevention of white-spot lesions achieved during orthodontic treatment using amorphous calcium phosphate-casein phosphopeptides.³ However, prevention is not always an option for the patient who presents with white enamel hypoplasia or fluorosis induced during the formative stages of tooth development. Standard techniques for addressing this esthetic concern include tooth bleaching and enamel microabrasion. If tooth whitening is successful, the "background" color will whiten to the level of the white spots resulting in a successful esthetic outcome. If unsuccessful, microabrasion may be attempted to remove superficial layers of enamel. However, enamel microabrasion technique is not without risks; the white spot can widen or cavitate at deeper levels creating a situation that may appear worse than before (Figure 1).

Fortunately, the case series by Muñoz and colleagues presents a noninvasive alternative approach to treating white-spot lesions with a low-viscosity resin infiltrant.¹ The authors presented four cases of treating white spot lesions with a commercially available resin infiltrant material (Icon, DMG, Hamburg, Germany). Under rubber dam isolation, 15% hydrochloric acid gel is applied to the white-spot lesions for 2 minutes and rinsed for 30 seconds. The etching of the enamel opens up spaces or microscopic pores for the resin to flow and penetrate, whereas the outer surface of enamel becomes protected as the monomer envelops the enamel crystallites. The ability of a liquid monomer to penetrate into the enamel and envelop the crystallite components can promote future resistance to demineralization.⁴ The esthetic benefit however comes from a change in refractive index after the resin infiltrates the porous body of the lesion causing the opacious enamel to blend better with the tooth.

This study demonstrates that it is possible to achieve improved blending of white-spot lesions using a very conservative resin infiltration technique. One of the limitations of a case series is the number of patients investigated and the lack of an objective scale by which to determine long-term success. The article documented a total of four cases, three cases after 1 week, and one case after 4 months. Another case series showed one out of six teeth presented with recurrent staining after 10 months.⁵ The question of color stability still remains to be answered and

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FIGURE I. A, White-spot lesions on anterior teeth prior to treatment. B, Central incisor of same patient showing iatrogenic cavitation using enamel microabrasion technique. The procedure was abandoned in favor of restorative treatment at a later date.



should be discussed with the patient along with the risk of the deepest, most opaque lesions still being visible after treatment. Even with the limits of this type of study, the results displayed in clinical photographs clearly show an effective esthetic result in the short term and should be the basis for future clinical trials with a greater number of subjects and well-controlled inclusion and exclusion criteria. Although the sealing of the enamel is a desirable feature, it must be remembered that color stability of the material itself will ultimately determine the effectiveness of the resin infiltrate as an esthetic treatment option.

REFERENCES

- 1. Muñoz MA, Arana-Gordillo LA, Gomes GM, et al. Alternative esthetic management of fluorosis and hypoplasia stains: blending effect obtained with resin infiltration techniques. J Esthet Restor Dent DOI 10.1111/j.1708-8240.2012.00527.x.
- 2. Richter AE, Arruda AO, Peters MC, Sohn W. Incidence of caries lesions among patient treated with comprehensive orthodontics. Am J Orthod Dentofacial Orthop 2011;139:657–64.
- 3. Robertson MA, Kau CH, English JD, et al. MI Paste Plus to prevent demineralization in orthodontic patients: a prospective randomized controlled trial. Am J Orthod Dentofacial Orthop 2011;140(5):660–8.
- 4. Gwwnett AJ, Matsui A. A study of enamel adhesives: the physical relationship between enamel and adhesive. Arch Oral Biol 1967;12:1615–20.
- 5. Paris S, Meyer-Lueckel H. Masking of labial enamel white spot lesions by resin infiltration—a clinical report. Quintessence Int 2009;40:713–8.

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