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CASE REPORT

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A Clinical Case Report of Icon® Resin Infiltration used for the Treatment of Non-Cavitated Discoloured Anterior Lesions

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Abstract

Background: Resin infiltration provides a non-invasive treatment option for discoloured anterior non-cavitated lesions, which commonly patients can present for aesthetic needs and treatment.

Objectives: To achieve a non-invasive aesthetic result that fulfills the patient's expectations and is clinically acceptable.

Method: The author reports on one case of a female patient that was concerned with the non-cavitated discoloured anterior lesions on her teeth. The clinical presentation was following completion of orthodontic treatment. The treatment proposed to the patient was a conservative approach by the use of Icon® resin infiltration.

Results: The treatment provided an aesthetic result that was non-invasive and produced a satisfactory outcome.

Conclusion: Resin infiltration provides a non-invasive treatment option with a satisfactory outcome as presented in this case.

Keywords: Non-cavitated discoloured lesions; Icon® resin infiltration; Aesthetics; Non-invasive treatment

Introduction

Aesthetics and minimal invasive dentistry have continually become part of current treatment options and modalities. The appearance is a vital component of the comprehensive oral care that we provide for our patients and we always face challenges to full fill all expectations; with a conservative approach in mind and to preserve as much tooth tissue as possible [1].

Resin infiltration was introduced in 2009 and it was offering a micro invasive treatment option. Icon® resin infiltration (DMG America, Englewood, NJ, USA), is a well-established resin infiltration [2]. It comprised of and worked by its acid etchant-15% hydrochloric acid-that removes the surface layer of the decalcified area with its penetration depth of 58 ± 37 µm [3,4]. This then allowing access to the body of the lesion which allows the resin to occlude within the pores. Then the body of the lesion is now rendered watertight by means of the resin which has a refractive index (RI Icon®=1.44) this is very similar to that of healthy enamel (RI=1.63) and also helps in preventing the diffusion of acids by creating a barrier within the lesion and not on the surface [5].

The recommended application of resin infiltration was for the treatment of hypomineralised areas of tooth tissue, and caries management. Other treatment options of microabrasion, whitening, composite restoration or veneers, are potentially more invasive. Thus making it a viable option for the management of early dental caries on anterior teeth. Resin infiltration has the advantage of being non-invasive, and also minimal invasive treatment becoming more likely as first option of treatment [6].

The objective of this article is to report the outcome of the treatment provided by using resin infiltration on non-cavitated discoloured anterior lesions.

Case Presentation

The patient was a 16 years old female presented after she had just completed orthodontic treatment. She was medically fit and healthy with no medications or known allergies. Her presenting complaint was that she was not happy with the appearance of her anterior teeth. On examination extra-orally she had no signs swellings, asymmetry, lymphadenopathy, intra-orally the soft tissues were all healthy and no abnormalities detected. The upper anterior dentition had discolouration and showed as hypomineralised stained areas around the labial surface of the teeth in the areas where the orthodontic brackets were placed. The staining was hard and dark brownish in appearance and was mainly due to her failing to maintain an exceptional level of oral hygiene.

All treatment options were discussed with the patient and mother, along with risks and complications plus explanation

of the likely prognosis. The minimal invasive approach of resin infiltration application was fully understood and consented for by the patient.

The treatment was carried out under rubber dam isolation thus in order to prevent contamination, soft tissue irritation and to achieve the ultimate isolation required for such technique sensitive procedure. Each step of the procedure involved eight stages and is summarized in table 1 along with the composition of the product [7]. The procedure was repeated a week later and then again after another week. So three applications were carried out in total.

Outcome

The results of the treatment showed a satisfactory outcome as displayed in the pre- and post-operative photographs that were taken (Figure 1). There were no reports of gingival or soft tissue irritation, also no post-operative sensitivity or pain. The patient was overwhelmed and happy with the outcome and final result.

Table 1: Composition and Direction of usage for Icon Resin Filtration®.

Material	Icon® Resin infiltration
Manufacturer	DMG-Hamburg, Germany
Composition	1. Icon-Etch (HCl 15%)
	2. Icon-Dry (99% ethanol)
	3. Icon-Infiltrant (methacrylate-based resin matrix, initiators, additives)
Directions of usage	1. Clean tooth
	2. Apply Icon-Etch. Let set for 2 min
	3. Rinse off with water for 30s. Air dry
	4. Apply Icon-Dry. Let set for 30s. Air dry
	5. Apply Icon-Infiltrant. Let set for 3 min
	6. Light-cure for 40s
	7. Apply Icon-Infiltrant. Let set for 1 min
	8. Light-cure for 40s

Discussion

Providing a minimal invasive treatment for a discoloured non-cavitated lesions was successfully achieved by using resin infiltration. Not only did this technique preserve tooth tissue it also reported no complications. The initial results of our case report are very encouraging and thus will be followed up. A systematic review also showed that resin infiltration as being an effective form of treatment [8]. The appearance of the lesions treated in this case were dark brown but hypomineralisation can also present as white spot lesions, which also have had successful outcomes with resin infiltration application [9]. With such application and treatment there is the need for further research and cases. This was also reported in another systematic review [10] in which they also recommended the need for more clinical evidence to support such findings. The colour stability and longevity over time has shown some promise but the results can be controversial due to the need of further future research in validating and supporting such outcome [11,12]. As well as removing discolouration researchers have found that resin infiltration being successfully applied in resealing intact restorations that have defective open margins [13].

Conclusion

For a non-invasive, non-cavitated discoloured lesions resin infiltration provides a suitable and justifiable treatment option as illustrated in this case report.

Patient Consent

Fully consented to treatment and publication.

Financial Support and Sponsorship

Nil.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article. There was no funding or external affiliation or organizations involved.

Figure 1: A) Pre-operative photograph, **B)** Post-operative photograph.

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