Minimally Invasive Management of Enamel Defects: Clinical Presentation and Management – A Clinical Case Report

by Dr Kiren Johal
Enamel defects are caused by genetic and/or environmental factors. They may present as changes in tooth colour eg white, cream, yellow and brown opacities. The actual structure of the enamel may also be affected and present as grooves or pits on the tooth surface.

**Conditions which can cause enamel opacities:**

1. **AMELOGENESIS IMPERFECTA**
   A hereditary disorder which affects enamel formation (1)

2. **FLUOROSIS**
   A developmental disturbance of enamel structure due to exposure to high concentrations of fluoride - the 2003 UK Child Dental Health Survey found a 1% prevalence of aesthetically concerning fluorosis throughout the UK (4)

3. **Caries**

4. **CHRONOLOGICAL HYPOMINERALISATION**

5. **MOLAR INCISOR HYPOMINERALISATION (MIH)**
   As result of localised trauma or infection to a primary tooth- secondary effects

6. **IDIOPATHIC**

Enamel defects can cause patients to feel very conscious of their appearance and this is what often prompts them to seek dental advice.

After initial examination and diagnosis of the cause of a patients enamel defects, these are some of the management options which can be considered.

1. **ENAMEL MICROABRASION**
   A conservative treatment method which removes a superficial layer of enamel.

2. **ICON INFILTRATION**
   A micro invasive technique which fills the lesion

3. **WHITENING**
   Home bleaching as a preferred method

4. **COMPOSITE BONDING**
CLINICAL CASE

Presenting Situation

This patient presented with a large brown enamel defect beneath on her buccal surface of UL1 fig 1. She had been reluctant to smile and self conscious for years. She wanted a whiter smile overall but for the brown defect on the UL1 to be removed.

Treatment Planning

A full dental examination was performed to ensure the patient was dentally fit before starting any cosmetic treatment. Our diagnosis for this lesion on the UL1 was a secondary effect due to trauma to a primary tooth which the patient recalls happening in her childhood.

This patient had been a regular attender of the dentist and hygienist for years and we were happy to perform cosmetic treatment on her.

An Ideal treatment of enamel discolouration/defects would (2):

- Cause insignificant loss of tooth structure
- Not damage the pulp or periodontal tissues
- Be easy to perform and for the patient to tolerate
- Give a permanent result

Based on these ideal treatment principles we produced a plan for her and she opted for vital home bleaching for all her teeth and minimally invasive treatment on her UL1 to improve the cosmetics using enamel microabrasion and a composite restoration UL1.
Treatment Stages

We were aware the depth of the brown lesion on UL1 was deep and therefore the treatment aim was to improve cosmetics as much as possible, the patient was aware perfection was not going to be an option by minimally invasive methods and she was happy to accept this before proceeding with treatment.

1 Vital home bleaching

Custom lab made trays were made so that 2 weeks of home bleaching could be performed by the patient for 14 nights. A 10% carbamide whitening gel was used. The patient achieved a great result from whitening and was happy with the overall improvement in shade.

2 Enamel Microabrasion

This was performed using the opalusture system on the brown spot UL1. You can see the initial lesion was very deep and although this method is best suited for superficial opacities we were able to lighten this well but not remove it in its entirety as expected. Opalustre is a chemical and mechanical abrasion slurry composed of 6.6% hydrochloric acid together with silicone carbide microparticles in a water soluble paste.

The steps were as follows:

A Isolation of the tooth using a rubber damn and caulking agent
B Due to the depth of the lesion approx 0.3mm enamel was removed using a water cooled fine grit diamond bur
C A plastic white mac tip was attached to the opalustre syringe and a 1mm layer of slurry applied to the brown defect.
D A 1:10 reducing handpiece was used at a slow rpm using the opal prophy cups included in the kit and applied directly to the tooth surface for 60 seconds.
E The tooth was rinsed and reassessed and the process was repeated 6 times
F After duraphat 22600ppm varnish was applied to the tooth for 30 minutes

3 Composite restoration

This was placed on UL1 and this was successful in achieving a great cosmetic outcome and the patient was delighted.
Treatment outcome

This case discusses a patient who has been affected by a brown enamel defect which had been present since she was a child. This treatment took 2 weeks of whitening and one 90 minute session in surgery.

The outcome of this case was successful and the patient was very happy with the improvements in her smile. We used the opalustre system to perform enamel microabrasion UL1, this allowed us to disguise any remaining discolouration with composite on UR1 and we also placed composite on UL1.

The aesthetical properties of composites have improved significantly over the past 15 years (3) and this allows us to produce wonderful results in dentistry without invasive restorative procedures.

Conclusion

As dentists we will regularly see patients with a wide range of enamel defects it is important to be able to diagnose these correctly and to produce a plan which is minimally invasive for the patient if possible. Microabrasion is quick and easy to perform and it is easily accepted by patients (3). Some lesions will respond differently to others it is always important not to overpromise to the patients.
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QUALIFICATIONS  
BDS (BHAM)  

Kiren obtained her dental qualification from the University of Birmingham. She achieved her degree with clinical distinction. She regularly attends hands on courses and seminars across the UK to learn the latest techniques to achieve clinical excellence. Kiren’s interests are in cosmetic dentistry and hand-crafting natural looking composite restorations. She has a great rapport with nervous patients and children.  

Kiren accepts referrals for complex composite rehabilitation, nervous patients, cosmetic dentistry and children.  

References  