

RESEARCH SUMMARY

Use of microabrasion to improve dental aesthetics

Effectiveness of microabrasion technique for improvement of dental aesthetics.

F. S. L. Wong and G. B. Winter *Br Dent J* 2002; 193: 155–158

Objectives

To investigate which types of enamel opacity are effectively treated by the microabrasion technique and whether this technique could be used as a diagnostic aid to determine the aetiology of these defects.

Materials and method

Thirty two patients who had enamel opacities affecting both upper central incisors were selected and the disfigurements were classified into four types: single line, multi-line, patched and diffused. The patient's previous medical history, possible history of fluoride ingestion, presence of taurodontism and family history of similar enamel defects were recorded. Both incisors were treated with Préma abrasive paste mixed with 18% hydrochloric acid. The aesthetic improvements were assessed by the patients and their parents and their satisfaction level after the treatment was recorded.

Results

Approximately two-thirds (65.6%) of the patients were satisfied with their appearance after microabrasion. Apart from four patients, the improved appearance was stable and acceptable to the remaining patients at the six month recall. Statistical analysis showed that acceptable improvement was found in patients with single line/patched types of defects but not in multi-line/diffused types ($P=0.03$). However, the aesthetic improvement was not related to the patient's fluoride history, presence of taurodontism or the family history of enamel defects.

Conclusion

Microabrasion using Préma abrasives with 18% HCl is effective in improving the appearance of enamel with single-line or patched opacities, indicating that these defects are a surface phenomenon. For the multi-line and diffused types, the defects appear to extend deeper into the enamel. The technique failed to assist in determining the aetiology of these defects.

IN BRIEF

- Easy to use classification of enamel opacities to determine whether microabrasion can improve the appearance of the disfigurement.
- Microabrasion works well with single line or patch types of enamel opacities, and the improvement is long term.
- Microabrasion is not effective in improving the appearance of multi-line and diffuse types of opacities.

COMMENT

The change in tooth colour from pristine white in the primary dentition to a darker yellowish hue in the secondary dentition often causes parental concern. When the new permanent incisors erupt with lines or patches of yellow or brown the parental worries increase. The practitioner who has worked hard on diet control, oral hygiene measures and fluoride toothpaste now feels somewhat concerned and embarrassed by the less than visually perfect newly erupted incisors. The causes of enamel discolouration may sometimes be clear from the patients' history. Excessive fluoride ingestion, a family history of *amelogenesis imperfecta* or some variety of metabolic upset during the incisor calcification period have all been postulated as direct causes of enamel defects. Sometimes no overt cause for the discolouration is elucidated.

Croll and Cavanaugh first described colour modification of labial enamel using pumice and hydrochloric acid. The latter solution was used to 'soften' up the enamel and act as a depth guide. Other workers have suggested the use of sand-paper discs or polishing burs for enamel reduction. Sodium fluoride is then applied to the tooth to restore the surface fluoride-rich layer. Approximately 100–200µm is removed in the procedure.

Unfortunately, not all patients benefit from microabrasion of the enamel. For such patients bleaching or construction of veneers is indicated. Veneers can be constructed with the use of composite (direct) or porcelain (indirect). Around this time orthodontic therapy with a fixed appliance may be contemplated and veneer correction should be delayed. Full crown construction for young patients is contra-indicated in the young patient.

This small study, by two respected authors, sought to elucidate which enamel opacities were improved by a microabrasion technique (carried out twice). The aesthetic component of their results was assessed by the patients and their parents. The patients were reassessed six months later. Approximately two-thirds of the patients were satisfied. One-third of the patients were unsatisfied and thought the procedures had been of little value as colour patches/lines remained.

Enamel defects had been grouped into four supposedly distinct groups. The authors found single line defects and patched defects improved the most. Multi-line defects and diffuse patches tended not to have been improved. They speculate that surface problems were removed, whilst ongoing ameloblast damage which continued throughout enamel formation remained and continued to cause visual problems.

Unfortunately, microabrasion proved not to be a diagnostic test. However, due to its simplicity and lack of damage to the dentition it should be tried as an initial means of improving anterior aesthetics.

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