Caries infiltration in daily practice - Esthetic implications

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Caries enamel lesions are characterised by a loss of minerals below a seemingly intact surface. The porosities inside the lesion body result in the typically whitish appearance of these lesions, so-called white spots\(^1\). Carious enamel lesions on smooth surfaces are a frequent adverse effect of orthodontic treatment with fixed appliances\(^2\). Although adhesively bonded brackets simplify orthodontic treatment, they inhibit thorough cleaning of the surrounding tooth surfaces, thus promoting plaque accumulation and the formation of carious lesions in these areas\(^3,4\).

Even though the progression of these lesions, after removal of the brackets, may be inhibited with preventive measures such as topical fluoridation, the persistence of the white spot lesions in the visible areas frequently lead to severe esthetic impairment\(^4\). Other risk factors for the formation of smooth surface lesions include insufficient oral hygiene, hyposalivation, or xerostomia\(^5\). The standard treatment for white spot lesions includes topical fluoridation and improvement of the patient’s oral hygiene in order to promote the remineralisation of the demineralised enamel\(^6,7\). Due to the improved access of the smooth surface white spots after debonding, these non-operative measures show good results with respect to limiting the lesion progression. However, especially for deeper lesions, only a mere superficial remineralisation is achieved. These lesions often have a very pronounced and mineralised surface layer\(^8,9\). But the lesion body under this surface layer remains porous, thus the white appearance of the lesion persists \(^4,10\). During the remineralisation phase, pigments from food, beverages, or tobacco products can also penetrate this lesion causing dark or brownish discolorations\(^9\). Many patients perceive these brown spots as even more unaesthetic. Different methods to treat these lesions have been established with varying success.

The microabrasion technique removes superficial enamel portions using a slurry of 18 per cent hydrochloric acid and pumice\(^10-12\). Unfortunately, considerable amounts of enamel up to a depth of several hundred micrometers have to be sacrificed with this procedure in order to achieve satisfactory esthetic results\(^13\). Other invasive restorative techniques, such as ceramic veneers or direct composite restorations, require the removal of extensive amounts of non-caries enamel and are very costly for the patient. The caries infiltration method is a novel, alternative therapy approach for the treatment of white spot lesions, based on the concept of sealing the micro-porosities of the lesion body and thereby inhibiting the substrate supply to inhibit the progression of the caries. For this purpose, the hyper-mineralised surface layer is removed with a 15 per cent hydrochloric acid gel\(^14\). In a next

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Icon is indicated for incipient caries with non-cavitated enamel and a radiological lesion progression into the outer third of the dentine. Treatment sets are available for proximal and smooth surface applications. DMG. A smile ahead.

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Clinical Indications:

<table>
<thead>
<tr>
<th>Proximal infiltration</th>
<th>Vestibular infiltration</th>
</tr>
</thead>
<tbody>
<tr>
<td>lesions in coronal enamel</td>
<td>lesions in coronal enamel</td>
</tr>
<tr>
<td>lesion progression likely</td>
<td>lesion progression likely</td>
</tr>
<tr>
<td>no clinical relevant cavitation</td>
<td>no clinical relevant cavitation</td>
</tr>
<tr>
<td>active lesions</td>
<td>active lesions</td>
</tr>
<tr>
<td>isolation possible</td>
<td>isolation possible</td>
</tr>
<tr>
<td>radiographic lesion extension up to outer 3rd of dentine</td>
<td>aesthetic impairment</td>
</tr>
</tbody>
</table>

Table 1: Indications caries infiltration

step, a specially developed, very liquid composite is applied onto the lesion to infiltrate it, driven by capillary forces17–19. The caries infiltration creates a diffusion barrier for cariogenic substrates inside the lesion, different from the traditional sealing method, which forms a barrier on the surface. This procedure pre-

References

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