

Caries management involving the use of a bulkfill composite

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Patient AZ, male, 29 years old, presented himself for the first time in September 2016. The patient had no complaints, but had not visited a dentist since 2011 and requested a routine examination. Clinical examination revealed several partially insufficient restorations in the posterior region. Numerous translucencies representing primary or secondary carious lesions were identified via radiographic analysis (Fig. 1, 2, 3).

All teeth responded as sensitive to the cold test (except the endodontically treated tooth 24). The patient's caries risk was rated as moderate to high, based on information collected concerning his caries experience and a number of direct risk factors. A number of parameters, including caries experience and risk factors, were collected to determine the caries risk. These can be used to identify the problems underlying the risk (here: excessive intake of fermentable carbohydrates, moderate oral hygiene, no other sources of fluoride apart from toothpaste) and (with different weightings) to assess the risk. The caries risk can then be used, for example, to determine a recall interval for the supportive caries therapy. The treatment plan was based on the clinically and radiographically collected information (fig. 5): Caries lesion staging was performed on the basis of the International Caries Detection and Assessment System (ICDAS), with lesions being classified in degrees of 1–6. In the present patient, early non-cavitated lesions (ICDAS 2) were clinically detected in a number of teeth. These were predominantly inactive. Radiographic findings of caries lesions were classified in 5 degrees (E1/2 – enamel caries lesion in the outer/inner half of the enamel, D1–3 – dentine caries lesion in the outer/middle/inner third of the dentine). Inactive non-cavitated lesions are marked green in the dental chart. Restorations that are to be monitored but not treated are also marked with a green outline. Lesions that are clinically non-cavitated but show signs of activity are marked orange. Restorations that require repair, dental contouring or repolishing are marked with a yellow border. Lesions with a non-integer surface are marked red. Restorations that need replacement are also marked with a red border. The following measures were planned:

1. Non-invasive measures are intended to lower the caries risk by modifying the above-mentioned risk factors, and to prevent inactive lesions from reactivating. These measures include dietary advice, instructions on oral hygiene, regular fluoridation both at home and in office, for example using fluoride varnishes.
 2. Micro-invasive measures install a diffusion barrier in or on the tooth surface. Organic bacterial aids can no longer diffuse into the enamel and minerals can no longer diffuse out. The progression of active lesions is prevented. These measures include resin infiltration of non-cavitated proximal lesions by means of Icon or sealing of occlusal lesions.
 3. Invasive measures: Replacement or repair of defective restorations and placement of new restorations.
- The performed active caries management made use of all these strategies, i.e. invasive, micro-invasive and non-invasive measures. Tooth 24 additionally received endodontic treatment for a pulp necrosis. At the end of the treatment, the caries risk was re-assessed and a corresponding supporting caries management was initiated. The restorative therapy on 27 is discussed in detail below.

Restoration with Ecosite Bulk Fill (Fig. 4, 6-12)

Restoration was indicated on tooth 27 due to the deep and cavitated mesial lesion. Due to the localization and the depth of the defect, the bulk fill composite system Ecosite Bulk Fill in the shade "Universal" was chosen for the restoration. Initially, the insufficient occlusal restoration was removed and access to the lesion was prepared while preserving a protective proximal enamel lamella. In the central, pulpo-proximal areas, carious tissue removal was performed until firm dentine remained (selective removal until firm dentin). The proximal lamella was removed and the enamel bevelled. With rubberdam in place and with a segment matrix applied (Palodent, Dentsply), the enamel was selectively etched with 37 % phosphoric acid for 20 seconds. Enamel and dentine were then conditioned with Ecosite Bond in accordance with the manufacturer's instructions, and the proximal box filled with a layer of Ecosite Bulk Fill. In a second step, the marginal ridge and the occlusal cavity was restored. After the matrix was removed, the material was contoured using a scalpel. The work was finished with fine-grain diamonds and composite polishing (Dentsply).

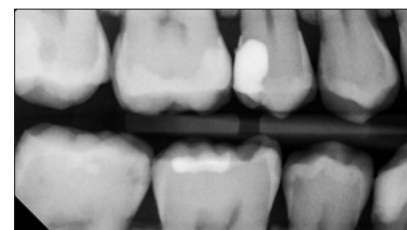


Fig. 1: X-ray image.

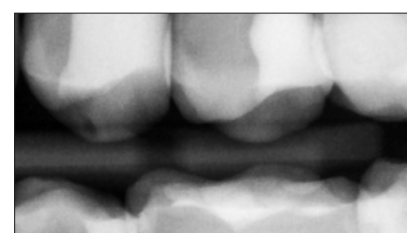


Fig. 2: X-ray image.



Fig. 3: X-ray image single tooth.



Fig. 4: Baseline situation upper jaw occlusal.

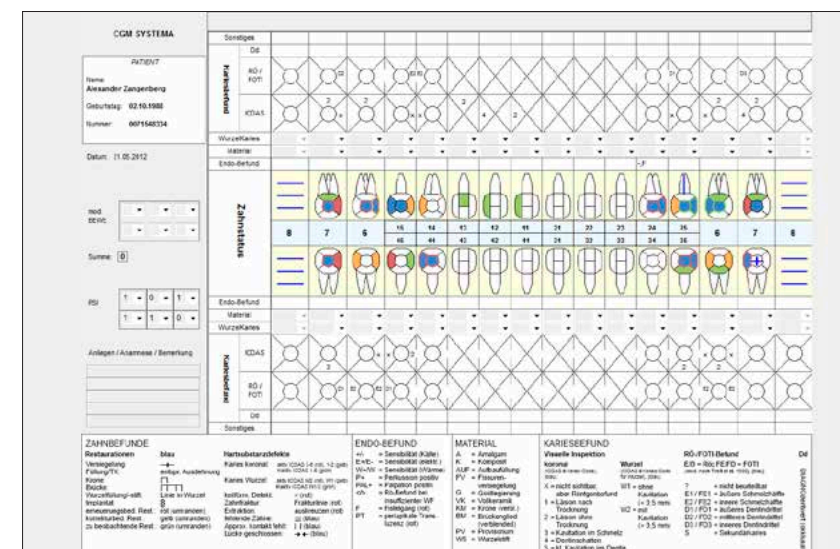


Fig. 5: Dental findings.



Fig. 6: Deep, cavitated lesion mesially on 27.



Fig. 7: Preparation.



Fig. 8: Preparation.



Fig. 9: Application of Ecosite Bond.



Fig. 10: Single-layer application of Ecosite Bulk Fill.



Fig. 11: Material finishing work.



Fig. 12: Finished restoration.

Evaluation

Bulk fill composites exhibit increased translucency before polymerization, which makes reliable curing possible even for thicker composite layers. This quality is particularly useful in the case of deep posterior cavities (as in the present case). The Ecosite Bulk Fill composite enables marginal adaption even in deeper regions due to its packable characteristics. Fewer working steps are necessary when compared with incrementally placed composites, which is an advantage in terms of time, but also makes the restoration procedure safer. The material exhibits high esthetic quality in the polymerized state; the color adaptation of the Universal shade is excellent. The material does not stick to the instruments during adaptation, and modeling of the occlusal relief is achieved effortlessly. Polishing could be completed in only a few steps and the end result was satisfactory for the patient and the practitioner.

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