

Direct composite restorations for aesthetic rehabilitation following anterior dental trauma

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Anterior dental trauma can present a restorative dilemma for dentists. Patients arrive seeking the fastest possible rehabilitation option. Often the defects are not so severe that a crown restoration is required, but aesthetic rehabilitation using composites in particular can often present challenges. In this case, a 30-year-old patient was dissatisfied with direct composite build-ups following anterior tooth trauma and wanted an aesthetic restoration with the most minimally invasive procedure possible.

Case report

Teeth 11 and 21 both presented uncomplicated crown fractures; sensitivity tests were positive, percussion tests were negative. To accurately determine the shades for the subsequent restorations, samples of composite were applied directly to the teeth in question. Both the dentine and enamel should be tested. In this case, shade EM was selected as the enamel material (Ecosite Elements Layer EM, DMG) to cover a dentine core in shade A3 (Ecosite Elements Pure A3, DMG) (Fig. 2).

After isolating the treatment area with a full rubber dam, a silicone index was produced to simplify the restoration of the palatal anatomy (Fig. 4). This is also possible prior to isolating. The old restorations were then removed and the remaining tooth tissue was prepared. To ensure a harmonious integration of the composite restorations, sharp edges should be removed and a wide but shallow bevel created. An etch & rinse adhesive system (OptiBond FL, Kerr, Bioggio, Switzerland) was then applied (Fig. 7, 8), prior to creating the palatal walls. The palatal walls were built using the enamel material and were made as thin as possible to make creating the translucent areas easier later on (Fig. 8). Two sectional matrices were placed vertically against each other to create the marginal ridges (Fig. 9); this technique ensures an uncomplicated and reliable reproduction of the proximal anatomy (Fig. 10). By applying the sandwich technique, the dentine core was built-up in a single increment (Fig. 11). For the best results, it is advisable to check the remaining layer thickness (Fig. 12) as this should be 0.5 mm for enamel materials. Flowable effect shades are able to imitate anatomical features such as translucent zones in the incisal area particularly well. In this case, the highly translucent effect shade INC was used in combination with the existing dentine material to create a translucent zone and halo effect in the incisal area (Fig. 13, 14). Afterwards, a final layer of enamel material was applied (Fig. 15). The restoration was then finished and contoured using coarse and fine diamond burs before being polished with composite polishers for a high-gloss effect (Fig. 16 – 21). Fig. 22 shows the result at a follow-up check after 6 months.

Conclusion

Direct anterior composite restorations can deliver reliable and aesthetic results if the key aspects of shade determination, preparation and layering techniques are considered. The selection of an easy-to-use composite system, which supports simple layering techniques and therefore eliminates sources of error, is essential for this type of treatment.

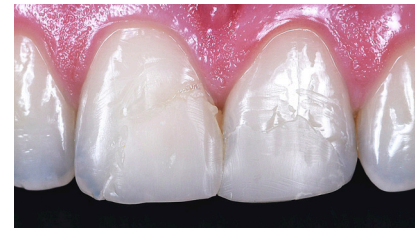


Fig. 1: Initial situation after provisional treatment of anterior tooth trauma with composite build-ups.



Fig. 2: Shade tests with Ecosite Elements (f.l.t.r.): EM, A3, A3.

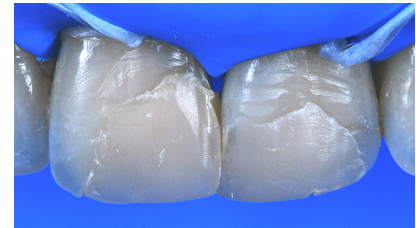


Fig. 3: Isolation of the treatment area with a full rubber dam.

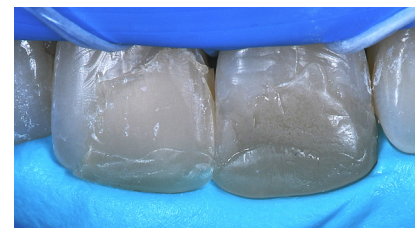


Fig. 4: Production of a silicon index for easier creation of palatal walls.



Fig. 5: Removal of old restorations and tooth preparation.

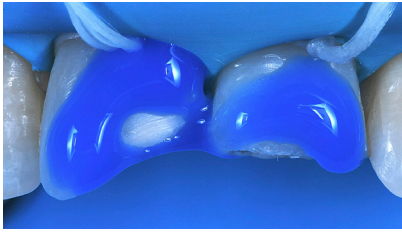


Fig. 6: Enamel conditioning.

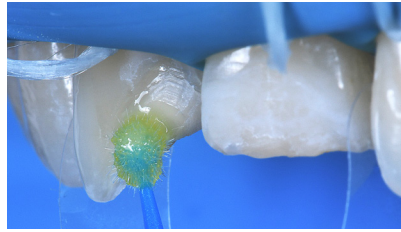


Fig. 7: Use of an etch & rinse adhesive system.



Fig. 8: Creation of palatal walls with enamel material (Ecosite Elements Layer EM, DMG) with the aid of a silicone index.

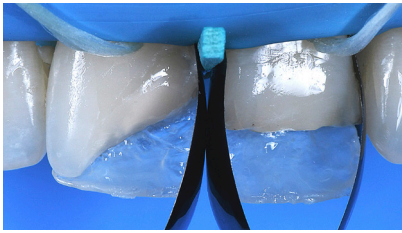


Fig. 9: Vertical positioning of the sectional matrices for placing marginal ridges.



Fig. 10: Outer layers ready for dentine core build-up.



Fig. 11: Built-up dentine core (Ecosite Elements Pure A3, DMG).

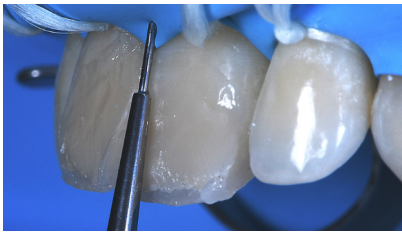


Fig. 12: Check of remaining enamel layer thickness.

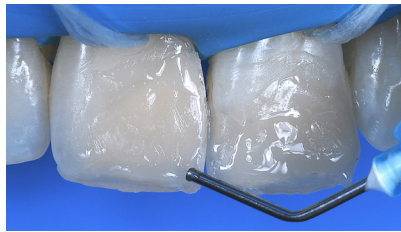


Fig. 13: Filling of the incisal space with translucent effect material (INC).



Fig. 14: Modelling of the incisal edge with dentine material (A3) for halo effect.

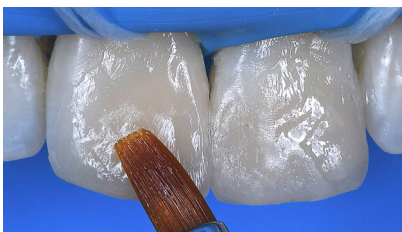


Fig. 15: Application of the final enamel layer (EM).



Fig. 16: Shaping with a course diamond bur.



Fig. 17: Shape and marginal fit check.



Fig. 18: Finishing with a fine diamond bur.



Fig. 19: Profile check.



Fig. 20: Pre-polishing.



Fig. 21: High-gloss polishing.



Fig. 22: Result.

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