A new method for direct composite restoration of the posterior teeth

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Introduction
The evolution of composite materials and adhesive techniques has considerably changed the approach to restorations in posterior areas. The advantages of adhesive restorations are not only of an aesthetic nature, but, above all, relate to the possibilities of conserving a greater amount of healthy tissue and "reinforcing" the residual dental structure.

However, to exploit these advantages fully, we need rigorous clinical procedures which can limit what has always been the main flaw of composite materials: the polymerization shrinkage and the resulting stress which is responsible for most clinical failures.

Manufacturers have focused their efforts on producing materials which are ever easier to use and which, at the same time, are able to minimise their associated problems.

The recent introduction of the SonicFill™ System follows this direction. SonicFill combines the attributes of a low viscosity composite and a universal composite. By activating the composite with sonic energy, it is possible to fill the cavity and adapt the low viscosity material easily, and then compact and model it while the composite changes its consistency until it reaches a higher viscosity.

The manufacturer claims that it has the advantages of being:

Fast: working time is reduced; it is possible to carry out single increments to an individual maximum thickness of 5 mm.

Reliable: reduced shrinkage and good adaptability to the cavity walls due to the low initial viscosity.

Easy: it is possible to deliver the material using a small-diameter cannula and foot switch control.

We present a clinical case below in which direct restorations have been produced with SonicFill on 3 elements of the 1º quadrant.

Clinical Case
Male patient, with an acceptable level of oral hygiene. In the maxillary right posterior quadrant, several deteriorated amalgam restorations are present with signs of marginal infiltration compatible with the age of the restorations, and signs of wear and tear in the zones of interocclusal contact. Tooth 1.5 has primary decay on the distal aspect of the tooth. The treatment plan was to replace the old amalgam restorations and to treat the primary caries with direct composites.

1. Initial case: 1.6 old amalgam with mesial caries to be replaced, 1.5 primary distal decay, 1.4 old amalgam to be replaced

2. Isolation of the operative area with a rubberdam stabilised with a universal SoftClamp

3. Clinical situation after removal of the amalgam restorations. The contiguous elements are protected with metallic matrices before the marginal ridges are broken down

4. Access to the approximal carious lesions

5. Cavity cleaning, removal of demineralized tissue

6. Finishing of the margins with SonicSys inserts

7. Sectional metallic matrices contraposed on 1.6 and 1.5 stabilized with a wooden wedge, MetaFix All-in-One matrix stabilized with a wooden wedge on 1.4

8. Matrices in situ, the adaption at the level of the cervical floor can be seen


10. Application of the Self-Etch OptiBond XTR – Bonding Adhesive System

11. Application of a thin layer of low viscosity Premise Flowable composite

12. Complete filling of the OM cavity of 1.6 with the SonicFill composite

13. Adaption of the material in the cavity with the CompoRoller oval tipped instrument and modelling with the point shaped tip

14. Application of the SonicFill composite in the occlusal distal cavity to the oblique ridge

15. Modelling the SonicFill composite with a Suter DD1-DD2 instrument

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Conclusion

The possibility of filling cavities to a depth of up to 5 mm with a single delivery effectively speeds up the work of performing composite restorations. The SonicFill composite presents good marginal adaption and is non-sticky. Once the sonic vibrations stop, it takes on an ideal consistency for modelling, and easily maintains the imposed shape. From an aesthetic point of view it is perhaps a little translucent to allow a greater depth of polymerization; however, it is possible to apply Kolor Plus® tints to make the restoration look natural. Ultimately, if the long-term controls show that the integrity of the margins is maintained, we will actually be able to confirm that we have accomplished a significant step towards simplifying direct restoration procedures with composite materials in posterior areas.

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About the Author

Prof. Luca Giachetti graduated in Medicine and Surgery in 1983 and specialized in Odontostomatology in 1986 at University of Florence Medical School. Msc in Dental Materials in 2009 at University of Siena Dental School. Chair of Dental Materials and Restorative Dentistry, University of Florence Dental School. Director of post graduate courses in aesthetics and adhesive dentistry, University of Florence Dental School. Dental Chief of Staff of Conservative Dentistry, Careggi Hospital-University, Italian NHS, Florence. He is member of the faculty in the International PhD program: “Biotechnology and Dental Biomaterials” at University of Siena Dental School. Associate Fellow in Education & Development, Warwick Dentistry, The University of Warwick, Coventry, UK. He has lectured at congresses and symposia and published on dental adhesives and composites in international dental journals. He runs a private practice in central Florence.