Composite restorations reinforced with fiberglass: An alternative for indirect restorations

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Abstract:

The use of fiberglass to reinforce composites increased since 80th decade. With the development of materials and adhesive techniques, this kind of material has another highlight on Dentistry. Based on scientific evidences, we are presenting here a new technique to reinforce composite restorations, to replace indirect inlays or onlays, as an alternative with resistance, esthetics, little chair time and low cost.

Introduction:

Fiberglass is a material that has many good properties for Dentistry. It is a very easy material to use, due its flexibility and excellent mechanical properties including fatigue resistance.

Fiber reinforcement systems are the most recent innovative techniques used to increase durability and damage tolerance of resin based materials.

Direct-filling resin composites are used in relatively small restorations and are not recommended for large restorations with severe occlusal-stresses. Large restorations usually are restored with indirect inlays or onlays due the fragility of walls and cuspids. If dentist choose to restore a large cavity in a fast and cheap way with a direct composite filling, the tooth is exposed to fracture along with the restoration failure. On the other hand, a crown would be more expensive and time consuming.

We introduce here a possibility of enhancing fracture resistance in composite fillings for endodontically teeth with the incorporation of glass fibers. Fibers change the mechanical behavior of these restorations and increase their resistance by absorbing the forces occurring inside the material subjected to stress. Furthermore, a layer of fiberglass placed at the interface filling redirect line fractures occurred in the composite, and propagated up to this level, deviating the path of fractures that could engage remaining dental tissues. The cracks initiated in the restoration are stopped or deflected by glass fibers, and are no longer transmitted to the cervical region. In addition, the distribution of stress within the fiber-reinforced restoration may increase the strength of the restoration.

Clinical Case:

Figure 01. Cavity preparation, preserving such structure as possible.

Figure 02. Isolation and lining cavities with glass ionomer.

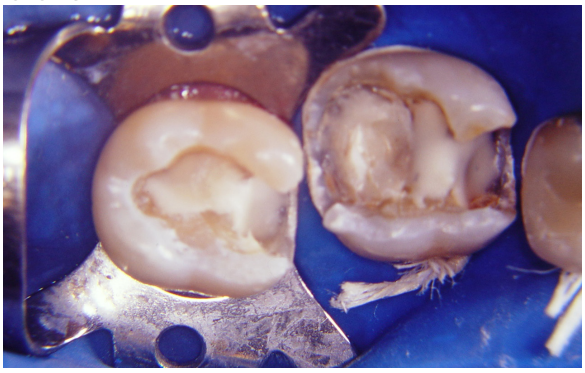

Figure 03. Etching cavities with phosphoric acid 37% for 15 seconds

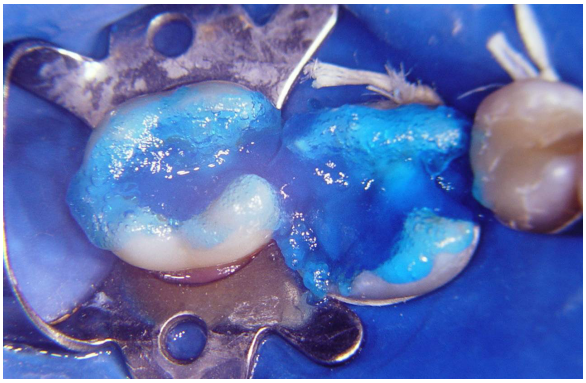

Figure 04. After rinsing, was applied a bond and the placement of a layer of fiber (Interlig – Angelus) between the composite layers. (Fiber could not be exposed at oral environment, it needs to be all covered with composite)

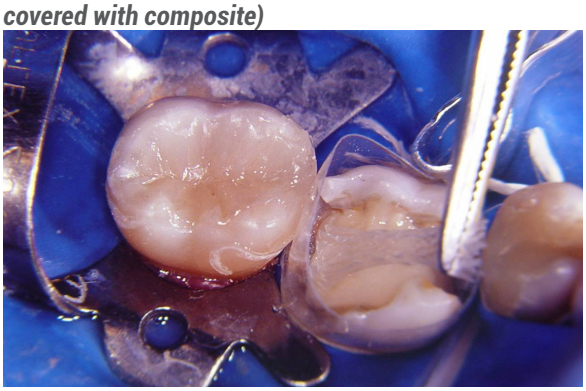

Figure 05. Each layer of finer and composite are cured by 20 seconds

Figure 06. Completed restoration reinforced with fiber.

Conclusion

Composite resin restoration along with glass fiber can be an acceptable treatment option for large restorations. As an immediate alternative, the placement of fiberglass inside the composite restoration may prevent failures without compromising the aesthetic and increasing the resistance.

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