

Integrity margin and interface in direct restoration

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Restoration margin and interface with tooth substance are the critical region to determine the quality of restorations. Defective restoration margin influences the marginal discoloration, recurrent caries and poor color matching. When the bonding to the marginal enamel is not sufficiently strong, the marginal gap is created. To enhance the bonding to the marginal enamel, phosphoric acid etching is generally applied, however, the shrinkage stress of composite resin occasionally causes the fracture of enamel margin. To avoid the fracture, the beveling is recommended especially when the enamel wall consisted of the longitudinally cut enamel prisms. For the beveling, superfine particle size diamond point is recommended to avoid the cracks at cavo-surface enamel margin. The beveling is also important to obtain color matching at the restoration margin, utilizing the light diffusion effect of the filling materials. Internal adaptation is believed to be essential for the quality of restorations from the view points of retention of restoration and pulpal protection. Achieving the integrity of interface between the restoration and cavity walls and floor, the selection of reliable adhesive and its appropriate applications including the sufficient light irradiation are reported to be recommended. The control of the shrinkage stress of the composite resin is also a significant issue, and the flowable composite resin lining after the bonding procedure is strongly indicated to prevent the gap formation at cavity floor. Even when the so-called bulk fill composite resin materials, the filling technique to minimize the effect of shrinkage stress is necessary.