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Modern Solutions for Direct Posterior Restorations

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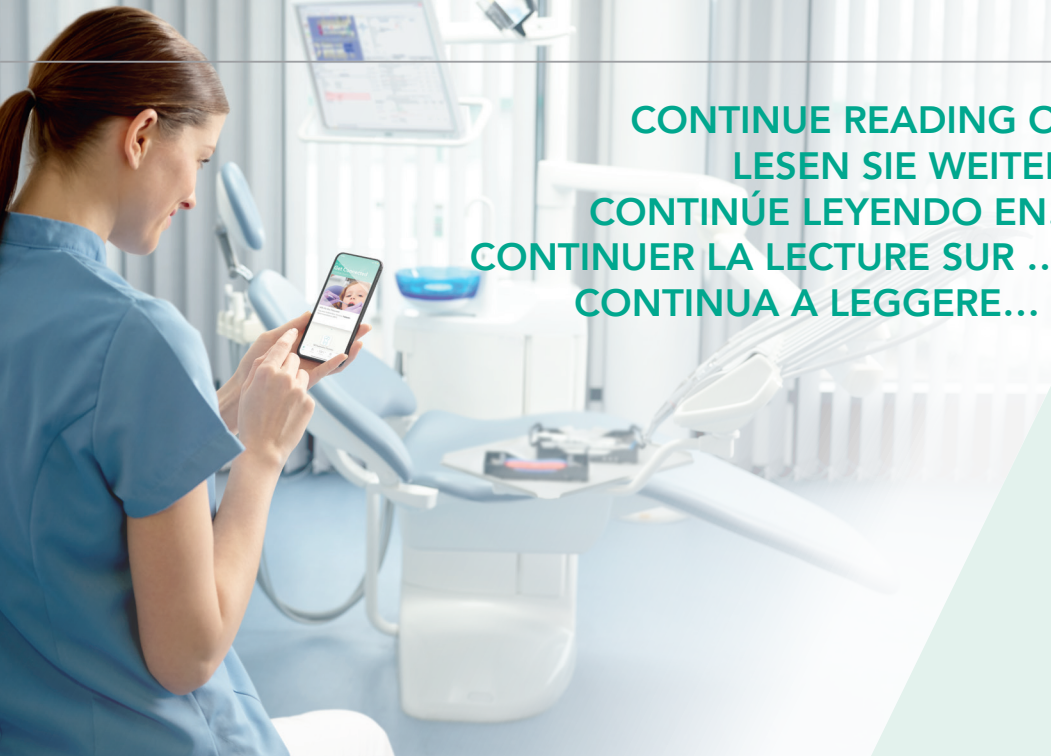
In order to restore effectively lost tooth structure, the chosen restorative material should demonstrate properties similar to natural tooth together with good adhesion, low polymerization shrinkage, high load bearing capacity and anticariogenic effect. The choice of a material also has to be adapted to the clinical situation, taking into account the patient's age, caries risk and aesthetic requirements, the possibility to isolate the tooth, the functional demands placed on restorations[1] and some economic considerations.

The most popular posterior restorative materials are resin-based composite, which are a combination of an organic part (matrix), an inorganic part (fillers) and coupling agents. Since their introduction on the market in the beginning of the 1960's, lots of attempts have been made to improve their composition in order to overcome two key shortcomings: lack of mechanical strength and high polymerisation shrinkage[2]. Improvements in composite materials have been especially focused on reinforcing the inorganic part, which is responsible for physical and mechanical properties like hardness, flexural strength, modulus of elasticity, coefficient of thermal expansion and wear resistance. The filler size in composite materials is directly connected to the mechanical properties of the material. Nanofilled composites are developed to offer materials that are more easily polished and have greater wear resistance[3]. This high wear resistance will be particularly important in the posterior region. When using nano-sized inorganic particles, the percentage of fillers in the material is increased, particles are uniformly dispersed in the organic matrix and the space between the particles is reduced, which reinforces and protects the organic matrix[4,5,6]. These nano fillers can be used in conventional composite materials, but also in flowable



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