COMPARATIVE CHARACTERISTICS OF DIRECT RESTORATION AND ORTHOPEDIC INLAY

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One of the main tasks of aesthetic dentistry is to recreate the most natural and natural appearance of the tooth. But with restorations made of composite materials, their service life is reduced; in a short time, restorations made of composite materials lose their aesthetics. Currently, inlays made of ceramic material have gained great popularity.

The purpose of this work was to consider the effectiveness of the use of composite restorations and ceramic inlays, based on the data of scientific medical literature of foreign and domestic publications.

In the process of studying this topic, dissertations, foreign and domestic articles, books on dentistry were studied.

In the practice of a dentist today, one of the main problems remains the irreversible processes of destruction in the hard tissues of the tooth, which can occur as a result of trauma, complications of caries, wedge-shaped defects, pathological abrasion , and others. One of the most difficult tasks for a dentist is filling cavities and restoring proximal surfaces, since in this case the greatest number of complex tasks arise, such as restoring the contact surfaces of the tooth.

Due to the active development of composite materials, and in particular, their adhesive properties, they are most often used in the restoration of chewing teeth.

Over the past decade, various filling materials have been developed with various fillers (macrophiles , microphiles , hybrid and particulate fillers). These phases are interconnected, but the adhesion between these two components is the weak point of the material, since it has low strength. Composites were created taking into account not only good polishability , but also high wear resistance, as well as good strength. Thanks to scientific research, hybrids appeared, and then microhybrid , and then highly filled microhybrid composites that differ in their composition and have in their composition 80 mineral filler, which in its composition has particles from 0.04 to 0.03 microns. Particles of different sizes are separated in a certain sequence, which determines their physical and chemical characteristics, resistance to abrasion and optimal polishability of the material.

The positive properties of composite materials include the following: aesthetics (photopolymer), low thermal conductivity, the ability to create improved tightness,

better restoration of the anatomical shape of teeth and contact points, unlike other filling materials. But at the same time, some negative characteristics should also be taken into account, which include: shrinkage occurs as a result of polymerization, a laborious application technique, a higher coefficient of thermal expansion than that of tooth tissues, a low elasticity modulus, a violation of the marginal fit can lead to depressurization over time, and peeling material from the walls of the cavity leads to the formation of microcracks and microcracks and, as a consequence, the formation of secondary caries.

Restorations made of composite materials quickly fail: after six months, 30% of fillings become insolvent, by the end of the year of operation already 50%, and after two years already 70% of fillings lose their functions. The presence of secondary caries, which occurs in most cases on contact surfaces, poor-quality and untimely treatment, as well as repeated loss of fillings from composite materials, led to tooth extraction in 35% of the examined patients. The result of the failure of the fillings is a repeated restoration, which means an increase in the cavity by preparation and thinning of the walls of the tooth. In this case, the bonding between the layers of the introduced material increases the stress, since a larger cavity requires a larger volume of material to be introduced into the cavity. More Watts D. _ noted in his scientific research the C-factor (cavity configuration factor) which is calculated as the ratio of the number of bonded surfaces (that is, those that interact with the material during polymerization) to the number of free surfaces.

Taking this into account, it can be concluded that the lower the C-factor, the lower the internal stress, which means that the possibility of separation is reduced, and with restorations on the proximal surfaces of the tooth, this risk can only be reduced by adhesively fixed restorations. Given all the above disadvantages of composite restorations, the best option for restoring the structure of tubercles, as well as filling large cavities (especially class 2 according to Black), can be considered the use of ceramic inlays. Due to the precision of the manufacturing of the ceramic inlay and the precision of the milling of the restoration, it is possible to achieve greater crown strength and the best marginal fit. The studied authors confidently note the advantages of inlays in the first place - this is the high strength of the manufactured structure, long service life, no shrinkage of the material, the material is almost identical to natural dental (biocompatibility), hypoallergenic, the presence of a large color gamut - the ability to choose a shade more suitable for natural teeth, do not cause the development of secondary caries under the tab due to the tight fit. Plaque does not accumulate on them, which indicates their better hygiene, inertness to cavity tissues. Depending on the severity of the defect of the crown part of the tooth and how the doctor plans to place the microprosthesis , it is customary to distinguish four types of inlay structures: " Inlay " - located only inside, " Onlay " - microprostheses covering the occlusal surface of the tooth and at the same time entering at different depths into its hard tissues and "

Overlay " - covering most of the tooth crown from the outside. After the standard preparation of the tooth for an inlay, the tooth is covered with a layer of anti-reflective powder, then a picture is taken using a 3 - D camera. The scanned image is displayed on the monitor screen, and the doctor can start modeling the missing part. Electronic three-dimensional image, enlarged by 12 times, allows you to model the structure with accuracy. The parameters of the future prosthesis from the program are sent to the milling and grinding machine. The absence of a human factor achieves the highest precision of the design, so no additional adjustment is required. The fabricated prosthesis is placed in a kiln, where it is fired and acquires the final properties of a ceramic structure. If necessary, the design is tinted and then glaze is applied to it. At the last stage, the installation and fixation of the prosthesis takes place. Thus, despite the development of modern composite materials when filling large cavities, the dentist faces a number of disadvantages, and lower porosity, high strength, abrasion resistance, good marginal fit and long service life provide a number of advantages when choosing between direct composite restoration and ceramic inlay in the direction of manufacturing the inlay by an indirect method .

The main advantages of the ceramic inlay include: no shrinkage and abrasion material, no discoloration from food coloring, no overhanging edges, no risk of secondary caries, long service life (10 years or more). The main disadvantage of the ceramic inlay is the high cost, the availability of additional equipment in the clinic. High strength, lack of shrinkage and abrasion , the formation of overhanging edges and the possibility of developing secondary caries, as well as a long service life, make it possible to opt for a ceramic inlay.

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