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COMPOSITION AND TYPES OF SOLIDIFYING FILLINGS WITH LIGHT

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Annotation: This chapter provides basic information regarding teeth, composition, decay, curing decayed teeth with different filling materials. The composition and types of various dental fillings is also included. A brief overview of shortcomings related to amalgam fillings is also discussed. The precursors, superiority, and types of composite filling materials compared with amalgam fillings are also listed. It also includes several unique features of nanocomposite dental restorative materials. A list of various antibacterial nanocomposites applicable in the field of dentistry is incorporated. The basic requirements and different types of monomers (polymers) used for restorative purposes in the field of dentistry are also included.

Keywords: Composition, fillings, types, Composite, nanocomposite, light.

Introduction

Currently, the therapeutic dental clinic mainly uses light-healing composite materials of the following groups:. microgibrid composites; nanocomposites; microtolidic compositions; flowing (liquid) compositions; condensed compositions.

MICROGIBRID

Composites

Nanocomposites

Microwave

MACROTLET

LIQUID COMPOSITES

Condensable

Macro compositions are thus the "fathers" of all compositions. Macro compositions were the first to be discovered in the dental materials market. Macro composite materials are characterized by a large particle size, the number of which differs from 8 – 12 microns the average particle size of a macro composition is about 10 microns. In addition to the size of the particle of the macro composition, these particles have an irregular, irregular shape. The filling of the macro composition is about 60%, but despite such good physical properties, the

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viscosity of the macrocomposite is low. When exposed to strong chewing loads, these simple - organic filler molecules fall out of the matrix of the macro composition and naturally cavities are formed. Due to the loss of filler, the stability of the surface layer of the material is lost. Disadvantages of macrocompositions include excessive exposure to the hard tissues of the teeth - antagonists, which leads to premature decay. it is noted that positive indicators are not enough both during the grinding of the macro Composite and during the strength of the color. From the advantages of using macrocomposites, we can say that it is an X-ray-contrast material and a durable composite material, so it is used to restore dental plaque

Microcompositional materials are Microfiltered (microphyl composites, microphiles) with a particle size of 0.04 to 0.4 microns. The filler is usually prepared on the basis of silicon dioxide (SiO; pyrogenic silicon) with a very small particle size (0.04 um). Sometimes synthetic Silicon-zirconium is used as a filler for microfilm compositions

and spherical strontium-zirconium particles with a volume of 0.1 to 0.3 μm. Microcompositions are materials with excellent aesthetic properties: a wide range of colors and varying degree of transparency, excellent polish and "dry shine" , while high color durability, microcompositions have serious disadvantages: low mechanical hardness, high polymerization shrinkage, high coefficient of thermal expansion, which is significantly different from dental tissues. Low mechanical strength is the most important disadvantage of materials, which depends on the very small size of the filler particles. To improve the power characteristics of the materials of this group, non-homogeneous microfiltrated compositions were created. In the process of their manufacture, pre-polymerized materials are added to the main composite mass.

Material particles of a size of 10-20 microns, prepolymerized filler with pre-filled filler (see Figure 260). Therefore, a high degree of saturation of the composition with filler was achieved (weight up to 80%). However, non-homogeneous micro-compositions could not solve the issue of radically improving the power characteristics of the materials of this group. Indicators of the use of microfiltered composites are limited to highly aesthetic, but not "loaded" restoration cases:. Filling Class III gaps Filling in Class V gaps production of aesthetic adhesive veneers (veneers) without covering the incision edge of the tooth. Microphilic composites are combined with strong microgibrid or nano-hybrid composite materials to form highly aesthetic restorations that are subject to mechanical impact (figure 261). Currently, due to the emergence of durable and aesthetic compositions created on the basis of nanotechnology, the interest of dentists in microfiltered compositions has significantly decreased. Composite restorative materials working with microgibrid light treatment compositions of this group contain an ultra - thin hybrid filler, which is a mixture of particles of different sizes-from 0.04 to 1 μm (average volume 0.5-0.6 μm) and a modified polymer matrix. Since the size

the filler particles contained in these materials do not exceed 1 micron, they are called microgibrid composites. These compositions have a number of positive clinical properties, due to which they are widely used in therapeutic dentistry. However, they cannot be recognized as "ideal materials", since some of their properties make it difficult for the doctor

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to work, do not allow achieving the desired aesthetic result, and often lead to the development of complications. Major clinical descriptions of microgibrid composites include. high strength, which is not enough when filling large spaces where the filler experiences increased loads during chewing; good aesthetics and color stability, but they are combined with the difficulty of polishing and "dry shine" durability. After 5-6 months. the microhybrid compositional recovery surface appears dull when dried (loss of" dry shine"); good processing properties that allow for complex and time-consuming work with these materials.

At the same time, work with microgibrid composites is hampered by their sufficient density and "fluidity", which complicates the modeling of restoration; ... relatively high polymerization shrinkage (2-5%) and low elasticity of these materials lead to polymerization stress and determine the need to take measures to prevent the negative consequences of this phenomenon (application of directed polymerization methods, etc.). Despite the fact that the problem of combining aesthetic and power properties in microhybrid compositions is not solved, they are considered universal Restorative materials. Indications for the use of microgibrid compositions filling the gaps of all black classes in the front and chewing teeth; ... vestibular aesthetic adhesive gloss production%; ... repair (restoration) of chips of ceramic and metal-ceramic crowns. Until recently, microgibrid compositions were the most common restorative materials. Now they are gradually being replaced by compositions created using nanotechnology and improving aesthetic and processing properties. The emergence of this group of compositions is associated with the development of nanotechnology In this case, the magnitude of the controlled particles, target transformations consist of only a few nanometers this corresponds to the size of atoms and molecules. Thus, nanocomposites are dental compositions new materials made using nanotechnology Based on the creation of composite restorative materials nanotechnology currently continues in two directions. The first direction is to improve the microgibrid comb change structure with nanophiles In this case, nanotechnology is used to achieve a good result spread of ultrafino in a microgibrid composition filler particles (nanoparticles with a volume of 20 - 70 nm = 0.02 - 0.07 microns).Work in this direction led to the creation of the microgybrid .nanofiller-modified composite materials, nanogibrid composites(fig. It is important to note that these are compositions improved compared to " traditional microgibrid compositions, strength and aesthetic properties features. However, due to the nanogibrid composition compositions include filler particles that are relatively large in size (more than 0.5 microns), their surface is in the abrasive process wearing the same as the" traditional " microgibrid surface compositions inevitably lose their dry brightness (see Figure 258, a), although this process is carried out more slowly. The second direction is to create nanocomposites on a nano - basis.different types of fillers. In such materials, the filler is nanostructured particles (0.02 - 0.075 microns) from 20 to 75 nm, produced using nanobatkes based on nanotechnology. Some of the nanomers are agglomerated into nanoclusters using nanotechnology-relatively large particles up to 1 mm in size. Spaces between nanoclasters do not use monolithic particles in the production of fillings filled with nanosomes evenly.Such components are known as real nanocomposites or nanoclusters

The main difference between Real nanocomposites and micro and nano - hybrid compositions is that in the process lasyon,, nanoclusters shift from the surface of the material at the same speed as the polymer matrix (number by nanometer). As a result of this process, the material will easily polish for dry shine and should shine for a long time The

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mechanical strength of real nanocomposites can be compared by the power of microgibrid composites, ma. On the other hand, real nano composites have a high aesthetic, good. Nano composites are versatile restorative materials. Their use is indicated to fill in the gaps production of aesthetic adhesive linings of all classes, etc. However, despite a number of clinical features Nano composites are superior to microgibrid composite materials, it is also impossible to recognize them as "ideal materials" because a number of their properties do not yet meet this criterion. Flowing composite materials (liquid compositions, low compositions, flowable composites) modified polymer matrix based on highly leaking resins. Degree their intensity is usually 55-60% by weight.

Conclusion

Hybrid fillings are used in these compositions. Produced these materials are directly in syringes with needle applicators the composition is included in the space-specific (liquid) compositions clinical dentistry with a number of valuable properties. It is essential for the clinical practice of these materials the group is their high fluidity and perfect adaptation on the surface, they are easily inserted from the syringe into the carial cavity through the needle applicator, they penetrate well into hard-to-reach places Nye and problem areas. These compositions have a liquid only in the period when external pressure is applied to them (when inserted into the space).After the pressure stops, they able to maintain a given shape.

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