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INTERRELATION OF PHYSICO-MECHANICAL PROPERTIES OF LAYERED PACKAGING MATERIALS WITH THE QUALITY OF ACRYLIC BASES OF REMOVABLE ORTHOPEDIC DENTAL PROSTHESES

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Introduction One of the most important tasks in modern orthopedic dentistry is to enhance the effectiveness of treating patients with complete or partial tooth loss and improve their quality of life through the correct and sequential fabrication of removable orthopedic dental prostheses [1]. Successful dental rehabilitation of patients with complete removable plate prostheses depends not only on a number of features of the chosen construction and clinical conditions of the patient's denture bed but also on the manufacturing technology of the materials used for its fabrication [2, 3].

The aim of our study was a comparative evaluation of the physico-mechanical properties of layered packaging materials for removable dental prosthesis constructions using an improved methodology.

Materials and Methodsıo A layered packaging material based on gypsum and super gypsum, modified with nitrile rubber latexes and silicon-organic emulsion, was developed. The selected modifiers varied in their structure, polarity of groups, and lyophilicity.

The main point of conducting a comparative analysis, which determined the quality of auxiliary dental materials, was the specification of the physico-mechanical properties of different types of gypsum through their laboratory study. In the system of qualimetric evaluation of gypsum, the indicative properties of auxiliary materials ("ORTHOGYPS", "GV-G-10 A-III", "Base Stone") provided by ISO-6873 were investigated. We divided the indicators into technological (defining features of the material packaging process) and physico-mechanical (general working time, setting time, relative expansion index during setting, relative expansion index after setting, compressive strength, linear shrinkage index).

Results and discussion. To prepare the gypsum slurry, 100 g of powder and 60 ml of water are required. Studies have shown that the technological efficiency of latex solutions increases due to the reduction of friction between gypsum particles resulting from the globular structure of latexes and the corresponding alkalinity of the solutions. Thus, the rheological properties of such gypsum solutions improve, allowing for a 10% reduction in the amount of water phase [4].

According to the results of laboratory and technological tests, the indicator of the hydrophilic ratio meets the requirements of ISO 6873. The most accurate indicator according to the aforementioned criterion is in "Base Stone" (0.28±0.01)%, while for the materials we studied, it was as follows: for "GV-G-10 A-III" - (0.28±0.03)%, for "ORTHOGYPS" – (0.29±0.01)%. The qualimetric indicator for "ORTHOGYPS" was 0.0 bits, for "GV-G-10 A-III" – 0.050 bits, for "Base Stone" – 0.050 bits.

Conclusions. As a result, it was determined that the developed modified components of the layered packaging material, in turn, provided acceptable accuracy of the base of the removable plate prosthesis, corresponding to the working model, due to the improvement of the physico-mechanical properties of the packaging

material and, consequently, the technological efficiency of removable orthopedic dental prosthesis constructions.

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