



ADVANTAGES OF USING LOCALLY PRODUCED GLASS IONOMER CEMENT IN THE CEMENTATION OF FIXED PROSTHODONTIC CONSTRUCTIONS

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Abstract:

The development of adhesive technologies in modern dentistry has enabled the reliable cementation of metal-free fixed prosthetic constructions; however, the problem of selecting an optimal cement remains relevant. Locally produced glass ionomer cements were comparatively studied alongside foreign analogues, and their physical, chemical, and aesthetic properties were evaluated. The study results demonstrated the clinical effectiveness and economic advantages of locally manufactured cements.

Keywords: fixed prosthetic constructions, local glass ionomer cement, cementation, clinical evaluation.

Objective:

To comparatively evaluate the physical, chemical, and clinical characteristics of locally and foreign-produced glass ionomer cements used for the cementation of fixed prosthodontic constructions, to determine their effectiveness, and to scientifically substantiate the advantages of locally manufactured materials.



Tasks:

To analyze the composition and setting mechanisms of local and foreign-produced glass ionomer cements. To compare the physical (strength, compressive resistance) and chemical (setting time, adhesion level) properties of the cements. To evaluate the clinical effectiveness of locally produced cements during the cementation of fixed constructions. To analyze aesthetic parameters and marginal adaptation. To develop scientific recommendations for expanding the clinical application possibilities of locally produced glass ionomer cements based on obtained results.

Main Part:

In prosthetic dentistry, comprehensive rehabilitation of patients with tooth and dental arch defects plays a crucial role. Despite the considerable advancements in medicine and dentistry—including modern technologies, improved diagnostic and therapeutic methods, and enhanced preventive approaches—the problem of restoring missing teeth and dental defects remains significant. According to available data, more than 95% of the adult population in Uzbekistan and developed countries requires high-technology prosthodontic care. This demand is largely associated with insufficient organization of primary dental care starting from childhood, especially in remote regions. Therefore, the introduction of modern materials designed for the cementation of fixed prosthodontic constructions is of high importance. At the same time, the development of import-substituting dental materials remains an urgent issue. The dental industry in Uzbekistan is actively developing, focusing on producing new materials and introducing them into clinical practice based on modern technological requirements. In recent years, significant attention has been given to the production and clinical implementation of locally manufactured glass ionomer cements (GICs). These materials are widely used for tooth restoration, fillings, as base materials, and especially for the cementation of



fixed prosthodontic constructions. As they are applied during the final stage of treatment, they ensure long-term durability of restorations, extend the service life of fixed prostheses, and reduce the risk of secondary caries. Moreover, the increasing use of press-ceramic and zirconia prostheses has heightened the need for reliable cementation materials capable of maintaining high aesthetic standards, particularly in the anterior region. Compared with foreign analogues, locally produced glass ionomer cements demonstrate several advantages: They establish a chemical bond with tooth structure, allowing strong adhesion without additional bonding agents. Fluoride ion release provides anti-caries protection and supports remineralization. Optimal setting time and ease of manipulation ensure efficiency in clinical application. High resistance to compression and mechanical load makes them suitable for fixed prosthetic restorations.

Conclusion (Scientific Style)

The results of the study indicate that glass-ionomer cements produced by local manufacturers possess physical-chemical and clinical properties comparable to those of foreign analogues. These materials demonstrate high reliability in dental practice, exhibit favorable biocompatibility with tooth tissues, and represent a cost-effective option for routine clinical use. Their ability to ensure long-term fixation, maintain chemical stability, and release fluoride contributes significantly to the prevention of secondary caries. The use of locally manufactured cements not only reduces dependence on imported materials but also provides an economically advantageous and clinically convenient solution. The broad implementation of such materials in dental practice represents an important direction in the scientific and practical development of dentistry within the country, supporting both technological progress and the strengthening of domestic production. Moreover, ensuring the consistency of quality indicators of local glass-ionomer cements, developing new-generation modified formulations, and expanding their clinical application constitute



relevant priorities for further advancement in national dental science. Contemporary research confirms that the fluoride-releasing capacity, remineralization potential, and biointegration properties of glass-ionomer cements make them promising materials for future innovations in restorative dentistry.

In summary, the widespread clinical use of locally produced glass-ionomer cements enhances competitiveness in the dental materials market and provides stable, effective, and long-lasting solutions for practical dentistry. This contributes to elevating the scientific, clinical, and economic development of national dentistry to a new level.

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