



EFFICACY OF USING MTA MATERIAL IN TREATING PULPITIS  
OF PRIMARY TEETH IN CHILDREN

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**Introduction.**

In recent years, the prevalence of dental diseases among children has been increasing significantly. In particular, primary tooth caries and pulpitis, one of its complications, are considered among the most pressing problems in pediatric dentistry. These diseases are not limited to a local pathological process but also negatively affect the child's general health, the process of feeding, speech development, and the proper formation of permanent teeth.

The anatomical and physiological characteristics of primary teeth—the thinness of the enamel and dentin layers, the spaciousness of the pulp chamber, and the high density of dentin tubules—create conditions for the rapid progression of the caries process. For this reason, caries in primary teeth can quickly progress to pulp inflammation—pulpitis. This condition causes severe pain, difficulty eating, and psychoemotional discomfort in children.

According to the World Health Organization and recent epidemiological studies, the global prevalence of milk tooth caries in children is an average of 46.2%. A meta-analysis based on the results of 81 scientific studies involving 80,405 children confirms that this indicator is high (Dental caries in primary and permanent teeth in children worldwide: systematic review and meta-analysis, 2020). Dairy tooth pulpitis was noted in 92.7% of cases (Khan F.R., Umer F., Afsar N., 2019). This information further underscores the need to seek modern treatment methods in pediatric dentistry aimed at preserving pulp vitality.

Although the materials used in conventional pulpotomy methods (formocresol, resorcinol-formalin, zinc oxide-eugenol) have a certain degree of clinical efficacy,



Their toxic effects, adverse biological impact on tissues, and failure to produce long-term stable results are widely discussed in the scientific literature. Therefore, in modern pediatric dentistry, the use of a new generation of materials with high biocompatibility, anti-inflammatory properties, and that promote reparative dentin formation is considered urgent.

Mineral Trioxide Aggregate (MTA) is one such innovative biomaterial, and its high biocompatibility, hermetic sealing properties, antibacterial activity, and ability to stimulate dentin bridge formation have been proven in numerous clinical studies. MTA demonstrates high efficacy in preserving pulp tissue vitality and halting the inflammatory process. In particular, ready-to-use MTA preparations in the form of One Fill Putty stand out for their ease of application and suitability for clinical practice.

This dissertation is a scientifically and clinically important study that investigates the clinical and radiographic efficacy of treating primary tooth pulpitis using MTA (One Fill Putty) and evaluates the potential for introducing this method into pediatric dental practice.

### **Objective.**

To conduct a clinical and radiographic comparative evaluation of the efficacy of MTA (One Fill Putty) in the treatment of pulpitis in primary teeth in pediatric dentistry, and to determine its advantages in preserving pulp vitality.

### **Tasks.**

1. To study the clinical and etiopathogenetic characteristics of pulpitis in primary teeth in children;
2. To study the physicochemical and biological properties of MTA (One Fill Putty);
3. To evaluate the effectiveness of treatment with MTA (One Fill Putty).

### **Materials and Methods.**

During the study, cases of pulpitis in children's primary teeth are diagnosed based on clinical examination methods. This involves assessing complaints, medical



history, pain characteristics, percussion and palpation results, and the depth of the caries. During treatment, the MTA (One Fill Putty) material is used based on the biological method.

Radiographic examinations are performed before and after treatment to assess the condition of the pulp and periapical tissues. The obtained clinical and radiological indicators are analyzed under dynamic observation at specified intervals.

The research results are processed using statistical methods, and the effectiveness of the MTA material is determined on a scientific basis.

### **Expected Results.**

This study will comprehensively evaluate the clinical and radiographic efficacy of treating pulpitis in primary teeth using MTA (One Fill Putty). The potential for preserving pulp vitality, eliminating the inflammatory process, forming reparative dentin, and preventing periapical complications will be determined.

At the conclusion of the study, it is planned to develop practical recommendations and an effective algorithm for the biological treatment of pediatric pulpitis. This will serve to improve the quality of treatment, reduce the number of complications, and ensure the healthy development of permanent teeth in pediatric dental practice.

### **Conclusion**

The MTA (One Fill Putty) material has high clinical and biological efficacy in the treatment of pulpitis in primary teeth. Post-treatment pain is resolved quickly, pulp vitality is preserved, inflammatory complications are reduced, and radiographic healing indicators are stable.

The obtained results confirm that MTA (One Fill Putty) is biologically safer, has a better prognosis, and provides long-term stable outcomes in the treatment of primary tooth pulpitis compared to conventional materials. Therefore, the widespread introduction of MTA (One Fill Putty) into pediatric dental practice is scientifically and practically justified.



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