

EFFECTIVENESS OF CONSERVATIVE TREATMENT FOR CHRONIC PERIODONTITIS IN CHILDREN USING CALCIUM-CONTAINING MEDICATIONS

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Abstract

The treatment of chronic apical periodontitis in multi-rooted permanent teeth with fully developed roots in children and adolescents represents a significant issue in dentistry, particularly in the presence of destructive changes in bone tissue. The aim of the study was to evaluate the effectiveness of conservative therapy methods using calcium-containing medications. Two clinical observations were conducted: in the first case, single-stage root canal filling was performed for granulating periodontitis without signs of exudation; in the second, temporary root canal obturation was applied using a combined calcium-containing medication for granulomatous periodontitis with signs of exudation. The methods included clinical examination, radiographic monitoring, and long-term follow-up of the patients. The results demonstrated complete restoration of bone structure and elimination of inflammatory symptoms. The conclusions confirm that the use of calcium-containing medications is effective in treating destructive forms of apical periodontitis in children and adolescents. The novelty of the study lies in a comprehensive approach that combines various treatment regimens depending on the clinical form of the disease, ensuring tissue regeneration and preservation of tooth functionality. The findings are recommended for use in pediatric dental practice.

Keywords: Treatment of apical periodontitis, chronic periodontitis in children, destructive changes in bone tissue, calcium-containing medications, bone structure restoration, multi-rooted teeth, conservative treatment, pediatric dentistry.

Introduction

Periodontitis of permanent teeth in children and adolescents is one of the most common complications of caries, requiring serious attention from dentists. The pathological process in the tissues surrounding the tooth root is often accompanied by pronounced destructive changes in bone tissue. This significantly complicates the choice of optimal treatment methods and necessitates a comprehensive approach. Successful conservative treatment of periodontal inflammation requires prolonged time and regular monitoring [4].



As a chronic odontogenic inflammatory focus, periodontitis serves as a source of sensitization for the body. This, in turn, provokes changes in the child's immunological status, reduces the nonspecific resistance of the organism, and contributes to the development or exacerbation of somatic diseases [5, 8].

The asymptomatic course of periodontitis in children poses a particular challenge, as it allows the pathological process in the periodontal tissues to progress. Delayed dental care often results in tooth loss, causing significant psychological stress for both children and their parents, while also negatively affecting the quality of life, including gastrointestinal function.

Nevertheless, the bodies of children and adolescents possess a high capacity for regenerating damaged tissues. This provides opportunities to expand the indications for conservative treatment, even in cases with severe bone tissue destruction.

The primary goal of periodontitis treatment is to eliminate inflammation in the periapical area, neutralize the negative effects of the inflammatory focus on the body, restore the structure of periodontal tissues, and preserve the functionality of the tooth [4].

In the pediatric dentistry department of the Bukhara Regional Specialized Children's Dentistry Center, calcium hydroxide-based medications are widely used in practice. These medications have proven their effectiveness due to the following properties:

- High antimicrobial activity and pronounced bactericidal effects;
- Ability to dissolve necrotic tissues;
- Regenerative action;
- Induction of osteocemental apical barrier formation [1].

For the treatment of destructive forms of periodontitis, combined preparations containing calcium hydroxide and iodoform are used. These medications exhibit a pronounced anti-inflammatory effect due to the presence of iodoform. For example, calcium-containing materials such as Sealapex (Kerr) and Acroseal (Septodont) are used for permanent root canal filling, as they stimulate bone tissue formation in the area of tooth root apices [7]. For temporary root canal filling, preparations like Calasept (Nordica Dental) and Calcisept-Iodo (Omega-Dent) are utilized [2].

This article presents the experience of successfully treating destructive forms of periodontitis using these medications in the pediatric dentistry department of the Bukhara Regional Specialized Children's Dentistry Center. The treatment ensured effective restoration of bone tissue and tooth functionality, confirming the potential of such approaches in pediatric dentistry.

Materials and Methods

The study aimed to evaluate the effectiveness of modern conservative methods for treating chronic inflammatory periodontal diseases in children and adolescents. To achieve this goal, a comprehensive analysis of the condition of dental and periodontal tissues was conducted, incorporating the use of advanced dental technologies and materials, as well as monitoring tissue recovery dynamics based on clinical and radiographic data.

The study utilized both qualitative and quantitative approaches. Qualitative methods included anamnesis collection, clinical examination, visual assessment of the condition of teeth and surrounding tissues, and symptom analysis. Quantitative methods focused on objective evaluation of changes in bone tissue and periodontal condition using radiographic studies. This methodological framework enabled a comprehensive approach to the problem and an objective evaluation of treatment outcomes.



The data were collected at the pediatric dentistry department of the Bukhara Regional Specialized Children's Dentistry Center. Patients underwent clinical examinations, including visual inspection, comparative percussion, and palpation. To assess tissue and structural conditions, intraoral periapical radiographs were used, allowing for detailed visualization of changes in bone tissue and the periodontal gap.

Data analysis was based on the clinical and radiographic results. Recovery dynamics were assessed at various stages of follow-up, including periods of 4 months, 1.5 years, and 3 years and 5 months for the first clinical case, and 1 month and 1 year for the second case. Treatment effectiveness was determined by the degree of bone structure restoration in the affected area and the elimination of clinical symptoms.

Methodological limitations included the potential influence of the initial tissue condition on the speed and completeness of recovery. Patients with severe tissue destruction demonstrated longer rehabilitation periods. Additionally, the quality of radiographic data depended on the characteristics of the equipment used and the precision of its interpretation. To minimize these factors, standardized examination and analysis methods were applied.

The novelty of the approach lay in the use of a comprehensive treatment strategy that combined modern materials, such as calcium hydroxide and composite materials, with step-by-step therapy based on dynamic observation. This approach achieved high clinical effectiveness and demonstrated the potential of the developed techniques for treating chronic periodontitis in children and adolescents.

Results

This section presents the clinical analysis results of treating inflammatory periodontal diseases in children and adolescents. The primary focus is on describing clinical cases that demonstrate modern approaches to diagnosis and therapy using conservative methods. The provided data illustrate the effectiveness of the conducted treatments, supported by radiographic findings and observations of tissue recovery dynamics.

Clinical Case 1. A 14-year-old patient, R., visited the pediatric dentistry department of the Bukhara Regional Specialized Children's Dentistry Center, complaining of periodic pain during biting and discoloration of tooth 4.6.



Puc. 1

Examination and Anamnesis. At the time of the visit, the facial symmetry was normal, and no pathological changes were observed. The bite was physiological, and the oral mucosa and alveolar processes showed no abnormalities.



Medical history: The child had no chronic somatic pathologies and rarely experienced respiratory infections. The DMFT index was 3, corresponding to a compensated form of caries.

Clinical Examination. Tooth 4.6 had previously been treated for complicated caries using the pulpotomy method. The following findings were noted during the examination:

- The tooth exhibited a grayish tint;
- The restoration on the occlusal and lingual surfaces was unsatisfactory (marginal fit was compromised);
- Percussion of tooth 4.6 was painless;
- The gingiva over the roots showed no abnormalities, and palpation was painless.

After removing the restoration, a carious cavity was found within the tooth. A paste-like material of a dirty gray color was discovered in the cavity, along with pulp disintegration in the four root canals.



Following mechanical and chemical treatment, the root canals were dry, and no signs of exudation were detected. Fig. 2

Radiological Examination. The intraoral periapical radiograph of tooth 4.6 revealed a large area of bone tissue destruction in the region of the roots and bifurcation with blurred margins, exceeding 1 cm in diameter.

Diagnosis. Based on clinical and radiological findings, the diagnosis was established as chronic granulating periodontitis of tooth 4.6.

Treatment. A conservative treatment method was chosen: single-stage root canal filling, as the canals remained dry and free of exudation after preparation.

First Visit:

- Under tori-block anesthesia (Septanest 1:200000), the unsatisfactory restoration was removed, and the carious cavity was treated.
- After removing the temporary dressing, an insulating liner (Vitremer, 3M ESPE) was applied.
- The tooth was restored using composite materials “Admira flow” and “Admira” (Voco).
- Polishing and smoothing of the restoration were performed, followed by post-bonding and fluoride application.

Follow-Up Results. Control radiographs of tooth 4.6 were obtained:

- *Fig. 2:* After 4 months – positive dynamics with a reduction in the resorption area in the periapical tissues.
- *Fig. 4:* After 1.5 years – partial restoration of bone structure.



- *Fig. 5:* After 3 years and 5 months – complete restoration of bone structure in the destruction area.

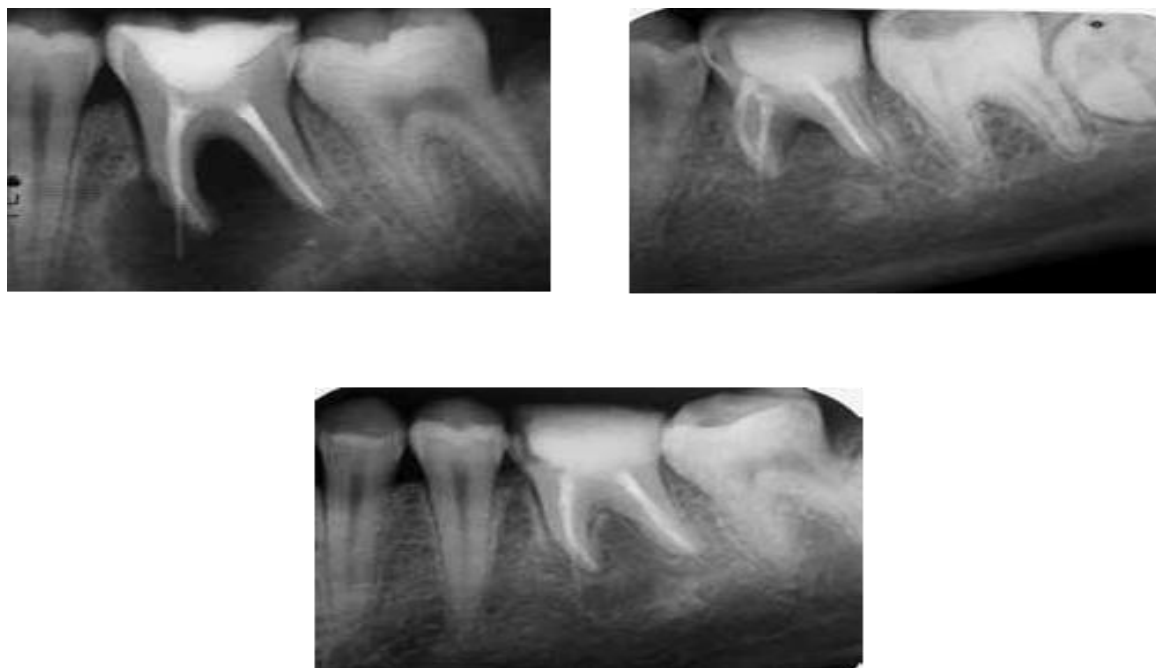


Fig. 3. After 4 months. Fig. 4. After 1.5 years. Fig. 5. After 3 years and 5 months.

Throughout the entire follow-up period, the child reported no complaints.

Clinical Case 2. A 15-year-old child, K., presented to the pediatric dentistry department of the Bukhara Regional Specialized Children's Dentistry Center with complaints of discoloration of tooth 4.6.

Examination and Anamnesis. At the time of the visit, facial symmetry was normal, and no pathological changes were observed. The bite was characterized by distal occlusion, and the oral mucosa and alveolar processes showed no abnormalities.

Medical history: The child had no chronic somatic pathologies and rarely experienced respiratory infections. The DMFT index was 5, corresponding to a compensated form of caries. Tooth 4.6 had previously been treated for complicated caries.

Clinical Examination. The following findings were noted during the examination:

- The restoration was in unsatisfactory condition;
- Tooth 4.6 exhibited a grayish tint;
- Percussion of the tooth was painless;
- The oral mucosa of the alveolar ridge in the projection of the tooth roots showed no abnormalities.

After the removal of the restoration, a carious cavity was found within the tooth, and paste-like filling material was discovered in the root canals. Following mechanical and chemical treatment of the root canals, a small amount of exudate was observed in the apical area.

Radiographic Findings (Fig. 6):

- A partially destroyed crown of the tooth;
- Root canals obturated to one-third of their length;



- Widening of the periodontal gap in the region of the mesial roots;
- Round bone tissue resorption areas (0.3–0.4 cm) with well-defined margins and a sclerotic zone along the periphery.

Diagnosis. Based on clinical and radiographic data, the diagnosis was established as chronic granulomatous periodontitis of tooth 4.6.

Treatment. A conservative multi-stage treatment approach was selected:

1. First Visit:

- Under tori-block anesthesia (Septanest 1:200000), the restoration was removed;
- The carious cavity and pulp chamber were prepared;
- Chemical treatment was performed using a 0.05% chlorhexidine solution;
- The material was removed from the coronal third of the root canals.



Fig 6

- The root canals were treated and filled with **Calcisept-Iodo** (Omega-Dent).
- A temporary restoration was placed for 7 days.

2. Second Visit (after 7 days):

- The patient reported no complaints.
- The temporary dressing remained intact.
- Percussion testing and the oral mucosa showed no abnormalities.



Fig 7

- The root canals were re-treated, and **Calcisept-Iodo** was applied as a temporary filling.

3. Third Visit (after 2 weeks):

- The patient reported no complaints.
- The canals were re-treated, and temporary obturation with **Calcisept-Iodo** was performed.



4. Fourth Visit (after 1 month):

- A reduction in the areas of bone tissue destruction was observed.
- Final root canal obturation was performed using the lateral condensation technique with gutta-percha points and **Sealapex** sealer (Kerr).



Fig 8

Fifth Visit:

- Restoration of the tooth was performed using composite materials Admira flow and Admira (Voco), followed by grinding and polishing.



Fig 9

Follow-Up Results. After 1 month, positive dynamics were observed, including a reduction in the areas of bone resorption. Complete restoration of bone structure (Figs. 7, 8, 9) was confirmed after 1 year.

Conclusion

The choice of treatment method for chronic periodontitis in permanent teeth with fully developed roots in children and adolescents requires a balanced approach, especially in cases with significant destructive changes in bone tissue. Radical methods, such as surgical intervention, are not always the optimal solution and should only be employed in exceptional cases.

In this study, a conservative approach was applied, involving two therapeutic options depending on the form of periodontitis and the presence of exudation in the root canals. For granulating



periodontitis without exudation, single-stage root canal filling with a calcium-containing sealer was used. In cases of granulomatous periodontitis with signs of exudation, a combined calcium-containing preparation was applied for temporary root canal filling.

Both approaches proved effective, as evidenced by the complete restoration of bone structure in the areas of destruction. The results demonstrate that the success of treatment for chronic periodontitis with significant destructive changes can be objectively assessed only after long-term follow-up. This emphasizes the importance of dynamic monitoring and a comprehensive approach to the treatment of periodontal diseases in children and adolescents.

References

1. Bolyachin, A.V. Preparations Based on Calcium Hydroxide. Root Canal Sealers Containing Calcium Hydroxide // Endodontics Today. 2003. Vol. 4, Part 1, No. 3-4. pp. 48-51.
2. Bulavko, R.A. Omega-Dent Preparations for Endodontic Treatment // Endodontics Today. 2007. No. 1.
3. Kiselnikova, L.P., Chibisova, M.A., Ramm, N.L. Application of Calcium Hydroxide in the Treatment of Permanent Teeth with Complicated Forms of Caries // Pediatric Dentistry. 2000. No. 1-2 (3-4). pp. 84-86.
4. Kolesov, A.A. Pediatric Dentistry. Moscow: Meditsina, 1985. pp. 158-162.
5. Lukinykh, L.M., Livshits, Y.N. Apical Periodontitis. NGMA, 1999. pp. 3, 65-66.
6. Mikhailchenko, V.F., Manuilova, E.V., Yakovlev, A.T. Clinical and Immunological Evaluation of Temporary Root Canal Obturations Using Calcium-Containing Preparations // Dental-Yug. 2009. No. 3 (63). pp. 28-29.
7. Jumaev, L.R., Azimov, M.I., Inoyatov, A.Sh. Incidence of Salivary Gland Diseases // Stomatology. Tashkent, 2009. No. 1-2. pp. 56-58.
8. Jumaev, L.R., Inoyatov, A.Sh., Rakhimov, Z.K., Khamidov, B.R. Use of Bakstims in the Complex Treatment of Inflammatory Salivary Gland Diseases // Stomatology. Tashkent, 2011. No. 1-2. pp. 50-53.
9. Jumaev, L.R., Akhmadaliyev, N.N. Assessment of Connective Tissue Metabolism in Patients with Salivary Gland Diseases // Stomatology. Tashkent, 2021. No. 1 (82). pp. 13-15.
10. Pavlova, N.V., Kiselnikova, L.P., Chibisova, M.A. Results of Using the Calcium-Containing Material "Calasept" in the Treatment of Destructive Forms of Periodontitis // Institute of Dentistry. 2003. No. 3. pp. 10-11.
11. Jumaev, L.R., Khamraev, S.Zh. Effectiveness of Lymphotropic Antibacterial Therapy in the Treatment of Inflammatory-Dystrophic Salivary Gland Diseases // "Current Issues in Dentistry." Collection of Scientific Papers of the All-Russian Scientific and Practical Conference with International Participation. Makhachkala, 2021. pp. 168-171.

