

COMPARATIVE ANALYSIS OF THE EFFECTIVENESS OF TREATMENT METHODS FOR TRAUMATIC DENTAL INJURIES IN CHILDREN

Abdumajitov Asadbek Shukhratovich

1st-year Master's student

Tashkent State Medical University

Pulatov Ashraf Ilkhomovich

Candidate of Medical Sciences

Tashkent State Medical University

Abstract: Traumatic tooth damage in children is one of the most complex and clinically significant problems in pediatric dentistry. The frequency of such injuries is determined by the active lifestyle of children, and the diversity of injury mechanisms (falls, blows during games, sports incidents) leads to various types and severities of damage: from contusion and mobility to fractures of the coronal part, disruption of root integrity, pulp complications, and the formation of inflammatory processes in periapical tissues.

Keywords: traumatic tooth dislocation; dental injury; pediatric dentistry; dental splint; orthodontic fixation; periodontal restoration; treatment; comparative analysis; rehabilitation

Introduction

An important feature of childhood is the continuous growth of jaws and the formation of roots, which makes the choice of treatment tactics more variable and requires consideration of biological factors, as well as long-term prognosis for tooth health and bite development.

Treatment of traumatic dental injuries must be not only timely but also as well-founded as possible: the clinical presentation, examination data and instrumental methods, child age, tooth development stage, pulp involvement level, and risk of complications are taken into account. At the same time, various approaches are applied, ranging from conservative (observation, immobilization if necessary, endodontic treatment according to indications, use of remineralizing and anti-inflammatory methods) to combined and reconstructive interventions (adhesive restoration, repositioning, splinting, surgical methods when indicated). However, the



effectiveness of each tactic may differ significantly depending on the type of injury and the timing of treatment.

In this regard, conducting a comparative analysis of the effectiveness of various treatment methods for dental trauma in children is becoming relevant.

Purpose of the study: to conduct a comprehensive analysis of the effectiveness of various methods for treating traumatic tooth eruptions in children based on a comparison of clinical results, healing times, and the quality of functional recovery.

Research methods: A prospective comparative clinical study was conducted with randomized distribution of patients into three study groups. The observation period was 24 months, with control points on the 1st day, 1st, 3rd, 6th, and 12th months from the moment of injury.

The study included 120 patients (68 boys and 52 girls) with traumatic tooth eruptions. The average age was 12.4 ± 2.1 years. Patients are randomly divided into three groups of 40 people each.

Group 1 (n=40): Conservative treatment without active fixation (control group)

Group 2 (n=40): treatment using a dental splint for 2 weeks

Group 3 (n=40): combined treatment with orthodontic fixation for a period of 4-6 weeks

In the first group, primary treatment of the wound was performed, foreign bodies were removed, and the tooth was carefully repositioned into the socket using the doctor's hands. A gentle diet, rinsing the oral cavity with antiseptic solutions (chlorhexidine 0.12%) 3-4 times a day, and analgesics were prescribed as needed. X-ray monitoring was conducted on the day of the injury and 7 days later. Second group: In addition to the conservative measures, a combined dental splint was installed (using composite material and 0.6 mm of orthodontic wire) for a period of 14 days. The busbar allowed the tooth to move freely in the vertical direction while simultaneously limiting horizontal movements. The third group utilized a dental orthodontic arch (0.016 × 0.022 inches, stainless steel) with rigid fixation of the dislocated tooth with adjacent teeth for a period of 4-6 weeks. Alternating tension adjustments were performed. Additionally, physiotherapy was prescribed: darsonvalization of the gums in the area of the damaged tooth (10 sessions).

The data was processed using SPSS version 26.0 software. To compare quantitative indicators between groups, the ANOVA test and Student's t-test



were used. The chi-square criterion was applied to categorical variables. The differences were considered statistically significant at $p < 0.05$. Descriptive statistics are presented as average values $\pm$ standard deviation.

Research Results: The groups were comparable in terms of age, gender, dislocation type, and duration of injury ($p > 0.05$). The average time from the moment of injury to consultation was 2.1 ± 1.3 hours, with no significant differences between the groups. Incomplete dislocation was diagnosed in 72 patients (60%), and complete dislocation in 48 patients (40%).

Complete restoration of normal consistency chewing ability was achieved in 97.5–100% of patients by the end of the third month in all groups. The fastest recovery was observed in group 2 (dental splint), with an average recovery time of 18.2 ± 5.4 days ($p = 0.041$ compared to group 1). 1 month after injury, the absence of pathological tooth mobility was identified in Group 1 in 75% of patients, Group 2 in 87.5%, and Group 3 in 95% of patients ($p = 0.008$). These differences remained statistically significant until the 3rd month of observation.

Normal coronal color and the absence of pulp degeneration signs after 6 months were observed in 92.5% of patients in Group 1, 97.5% in Group 2, and 95% in Group 3 ($p > 0.05$).

The restoration of the normal structure of periapical tissues occurred significantly faster in group 3 (combined treatment with orthodontic fixation): full recovery was achieved in 97.5% of patients by the 12th month (in group 1, the same result was $p = 0.036$).

Conclusions

The conducted comparative study demonstrates that the choice of treatment methodology for traumatic tooth dislocation significantly affects clinical outcomes in children. A dental splint for a period of 2 weeks ensures an optimal balance between functional recovery and patient comfort and can be recommended as the primary treatment method for incomplete dislocations. Orthodontic fixation is indicated for complete dislocations to prevent recurrence and ensure better regeneration of periodontal structures. Conservative treatment without fixation is not recommended as the primary method due to the high risk of recurrence (7.5%). Early admission (within 2 hours) and the patient's young age are favorable prognostic factors regardless of the chosen methodology. The research results comply with IADT recommendations and can be used to develop standardized



protocols for managing children with traumatic dislocations in pediatric dentistry.

Literature:

1. Andreasen JO, Andreasen FM, Andersson L. Textbook and color atlas of traumatic injuries of the teeth. 5th ed. Hoboken: Wiley-Blackwell; 2018.
2. Di Benedetto A, Ferro R, Fortunato L. Traumatic dental injuries in Italian children: a multicenter study. *Dent Traumatol*. 2019;35 (1):25–33.
3. Lauridsen E, Hermann NV, Gerds TA, Kreiborg S, Andreasen JO. Occurrence and repeatability of dental trauma in the same dentition: a national cohort study. *Dent Traumatol*. 2017;33 (5):355–363.
4. International Association of Dental Traumatology. Guideline for the management of traumatic dental injuries: fractures and dislocations of permanent teeth. *Dent Traumatol*. 2020;36 (4):331–349.
5. Kahler B, Hu JY, Marriott-Smith G, Heithersay GS. Splinting of teeth after trauma: a systematic review and meta-analysis. *Aust Dent J*. 2016;61 (S1):6–15.

