

Etiology and therapy of dental trauma. A clinical and statistical approach

PhD Thesis Abstract

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The aim of this research was to evaluate the prevalence and etiology of dental trauma and to assess some of the factors that influence the treatment techniques of these lesions.

In the first chapter of the thesis the current state of knowledge on etiology, clinical examination, classification and types of dental injuries is described based on the recent dental literature.

In the first study of the thesis' original research part, a retrospective evaluation the prevalence of dental trauma in deciduous and permanent teeth among children and teenagers who attended two dental clinics in Târgu Mures, Romania, between 2003 and 2011 was conducted. Correlation of their risk of dental trauma with factors such as gender, age, physical activities and extent of incisor overjet were evaluated. The records of the 4638 patients who had attended the two clinics indicated that 1139 had suffered dental trauma. The frequency of traumatic injuries to deciduous teeth was approximately equal for boys and girls particularly for those aged between 1 and 2 years. In the permanent dentition, dental trauma was more frequently found boys, and the most affected age group was between 11 and 12 years of age, both for boys and girls. The most common causes of the injuries were falls, in deciduous teeth especially during learning to walk and in permanent teeth particularly during cycling or other sporting activities. The most frequent type of trauma found in the deciduous dentition was lateral luxation and non-complicated fracture in permanent teeth. A positive relationship was noted between the presence of overjet associated with lip incompetence and the frequency of dental trauma.

In the second study we tried to determine whether oral piercings can cause dental trauma. We clinically examined 54 patients with oral piercings, which were also asked to fill in a questionnaire about wearing duration, whether the piercing itself was performed in piercing (tattoo) salon by an authorized person, why he or she chose such a jewel, whether he or she is aware of risks, at what time intervals is the piercing removed for cleaning and what methods are used and, finally, whether or not he or she "plays" with the piercing. Based on this research it was concluded that one third of those who wore oral piercings presented small coronary lesions in the anterior teeth.

In the following chapter, based on the findings of an in vitro study it was determined whether the repositioning and bonding of the fractured tooth fragments renders the tooth more vulnerable to further injuries, and also to investigate the bond strength of different materials and techniques used in reattaching tooth fragments. In this study, 48 mandibular extracted incisors were fractured using a Charpy pendulum hammer. Afterwards the fragments were repositioned and bonded with different restorative materials and then fractured again under the same conditions. Both energy values – initial and final – needed to fracture the teeth were recorded and compared.

Under the conditions of this study, beveling the margins of the bonded surfaces enhanced the adhesion.

In the fourth study the variation of adhesive strength of reattached tooth fragments was studied in two instances: first when the dentin surface was dried out and second when, after being dried out, the surface was rewetted. One hundred and sixty-nine extracted lower incisors were fractured and divided in two groups. In the first group, before being reattached and fractured again, the teeth were dried for different periods of time. In the second group, after being dried for 24 hours the teeth were stored in water for different periods of time and then reattached and fractured again. In all groups, the energy needed to fracture the teeth was measured and compared with the energy needed to fracture the intact teeth.

Keeping a fractured tooth fragment dry can worsen its chances of adhesively being reattached to the tooth. A fractured tooth fragment that has dried out must be rewetted before trying to bond it to the remaining tooth structure. Rewetting of dried tooth fragments longer than one hour appeared to worsen the adhesive bond with the remaining tooth structure.

In the fifth, questionnaire-based study, the knowledge about the treatment of dento-alveolar trauma was evaluated on a group of dental practitioners. The most receptive to filling in the questionnaires proved to be the dentists with 10 or less years of experience in this profession. Most of the correct responses were recorded for questions related to milder forms of trauma. Oral-maxillofacial surgeons gave better answers to questions about severe luxation and dental avulsion. A reluctance of dentists without specialization in the management of severe dental trauma was noted. Based on the findings of this study it was concluded that a broader participation of dentists in scientific events on dental trauma would be indicated.

As a general conclusion one can say that dental injuries have become an important part of the dental pathology and measures should be taken both in prevention and in improving the management of dental trauma.

Keywords: dental trauma, crown fracture, adhesive reattachment, oral piercings, level of knowledge