



Forensic Aspects Of Dental Fractures

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ABSTRACT

The article notes that tooth fractures can occur in the crown and neck regions, as well as in the root region. In this case, the strength properties of teeth increase depending on the order of their arrangement, as a result, fractures of large masticatory teeth are relatively rare and occur predominantly in fractures of the jaw or its alveolar process. They can also be transverse, oblique, and vertical with respect to the axis of the tooth. The tooth cervix refers to the weakest part of the crown in terms of strength, and fractures occurring here are usually complete.

Keywords:

teeth, fractures, mechanism, characterization

Introduction. Oral health is a major indicator of overall health, well-being and quality of life. WHO defines oral health as "a state characterized by the absence of chronic oral and facial pain, oral cancer of the mouth and throat, oral infections and ulcers, periodontal (gum) disease, dental caries, tooth loss and other diseases and health conditions that limit a person's ability to bite, chew, smile and speak and their psychosocial well-being" (WHO, 2018) [8,11].

Oral and dental injuries are impact injuries to the teeth and/or other hard or soft tissues in and around the mouth and oral cavity [7]. The global prevalence of trauma to all teeth (deciduous and permanent) is about 20% [9]. Causes of oral and dental trauma can include oral conditions (malocclusion, in which the upper jaw significantly overlaps the lower jaw); environmental factors (e.g., unsafe playgrounds and schools); high-risk behaviors; and violence [3,4,5]. Treatment of such injuries is expensive and time-consuming and can sometimes lead to tooth loss with consequences for facial formation, psychological development, and

quality of life [1,2]. According to forensic medical practice, dental injuries account for an average of 2.4% of maxillofacial trauma, and mandibular fractures account for 70 to 85% of all facial fractures of non-gun origin [6,10].

The aim of the research was to determine the type and nature of dental fractures.

Material and methods of research. The object of the study was the materials of forensic medical examination of cases of dental injuries, conducted in the outpatient department of the Tashkent city branch of the Republican Scientific and Practical Center for Forensic Medical Examination of the Republic of Uzbekistan.

237 forensic medical examination reports, including 225 (94.9%) primary, 8 (3.37%) additional, and 4 (1.68%) repeated reports (group I), were examined using a special computer program with the use of questionnaire cards developed by us, including classification parameters (case circumstances, localization, nature, cause, mechanism, age, and

its influence on the outcome).

A retrospective analysis of 152 case histories and outpatient records of patients with jaw injuries who were undergoing inpatient and outpatient treatment at the maxillofacial surgery department of the clinic of the Tashkent Dental Medical Institute (group II) was also conducted.

The following research methods were applied: catamnestic, clinical, macroscopic, stereomicroscopic, radiologic, statistical.

The results of the study and their discussion.

The results obtained indicate that in the absolute majority of cases, the injury was sustained as a result of a fight 177 (45.5%), an automobile injury 80 (20.56%) and a fall 54 (13.88%) There have also been cases of injury during sports, tooth extraction, etc. When analyzed by groups, the number of hospitalized patients with dental injuries during tooth fall and extraction was 15 (9.86) and 10 (6.57%), respectively, than those who underwent examination were 19 (8.02%) and 14 (5.9%). Although the number of people examined for dental injuries in a car accident was also higher at 54 (22.78%) than in persons of group II at 26 (17.1%). In both groups, a similar pattern was observed in terms of the circumstances of the injury.

A study was conducted to establish dental damage in both groups. At the same time, a predominance of fractures of the tooth enamel alone (enamel detachment) was revealed in 45.76% (178) and a fracture of the tooth crown without pulp damage in 20.3% (79), respectively, in both study groups.

The most frequently detected fracture of the tooth crown without pulp damage was also a fracture of the tooth root 9.77% (38), tooth luxation 5.4% (21), fracture of the tooth crown with pulp damage 4.11% (16), complete dislocation of the tooth 3.86% (15), multiple fractures of teeth 3.34% (13). fracture tooth root and crown each 2.83% (11), tooth intrusion or extrusion 2.31% (9) and tooth fracture unspecified 1.8% (7). Although in percentage terms in group I, the types of damage clearly prevailed: fracture of the tooth enamel only,

fracture of the tooth crown without damage to the pulp, fracture of the tooth root.

When determining the mechanism of dental damage, there was a clear predominance of impact in the dental area in both groups of 58.5% (in group I - 66.24%, in group II - 46.05%). Although there was a bend and a total of 38.04% (in group I - 29.95%, in group II - 50.65%), and in some cases a shift of 3.59% (in group I - 3.79%, in group II - 3.28%).

Data on the establishment of the impact mechanism were clarified only in both groups. In particular, it was found that in the absolute majority of cases the blow was applied to the upper jaw area, less to the lower one.

The most common punches were 48.59% (189) (in group I - 57.8%, in group II - 34.21%), less with a stick, 10.54% (41) rebar (in group I - 10.12%, in group II - 11.18%) and other objects 32.39% (126) (in group I - 24.47%, in group II - 44.74%). Brass knuckles strikes were also detected 3.34% (13) (in group I - 2.95%, in group II - 3.95%), and bat strikes 5.14% (1) (in group I - 4.64%, in group II - 5.92%). As can be seen in the I-th group, there is a clear predominance of punching over the rest.

Fracture of the tooth enamel only. This damage occurs in two variants: in the form of cracks that do not lead to a violation of the anatomical integrity of the tooth, and in the form of enamel splinters that lead to it. A fracture of the tooth enamel alone can be combined with a bruise (concussion) of the tooth.

Upon examination, half of the victims are found to have enamel cracks, localized most often at the cutting edge, mainly in the surface layers of the enamel. However, the main impact force in case of bruising and fracture of the enamel is transmitted to the periodontium in the area of the apex of the root, as a result of which a part of the periodontal fibers may rupture or its ischemia may occur due to tissue edema or compression of periodontal tissues by a hematoma.

Fracture of the tooth crown without damage to the pulp. In this type of injury, the fracture line passes through the dentin.

Most often, this is an oblique fracture of the medial angle of the crown, less often of the distal

angle, and very rarely the fracture line runs parallel to the cutting edge or along the axis of the tooth. The enamel usually breaks off along the enamel-

dentine border. Depending on the size of the broken part of the tooth crown, the pulp is located at different distances from the fracture line. Pulp necrosis due to rupture of the neurovascular bundle in the area of the apical opening with a fracture of the crown within the dentin is rare, since the detachment of a part of the crown of the tooth dampens the force of impact, which could be transmitted to the root and periodontium.

Fracture of the tooth crown with pulp exposure. Fracture of the crown with pulp exposure is quite common. According to various sources, it ranks fourth among all types of dental injuries. As a rule, patients sought help on the day of the injury or the next day. Pulp exposure can be spotty or complete.

The color of the injured pulp depends on the timing of the patient's treatment. Immediately after the injury, it is bright red, and a few days after the injury, it acquires a grayish hue. When probing, the pulp is sharply painful and may bleed. Percussion is painful due to injury to periodontal tissues, the pain may pass over time if periodontal infection does not occur. The tooth is motionless. X-ray examination makes it possible to clarify the degree of root development and exclude its fracture.

Fracture of the tooth root. The prevalence of root fracture is 0.2-7% of traumatic dental injuries. The fracture can be independent or in combination with damage to the hard tissues of the tooth and with the exposure of the pulp. A root fracture can be combined with a fracture of the alveolar process. A root fracture can occur at various levels of the anatomical length of the tooth root: apical, median or cervical.

There are different types of fractures of the tooth root: transverse, longitudinal, oblique, combined. They can be displaced by fragments of the tooth root or without displacement.

In the early stages after the injury, the victim complains of aching pain and/ or pain when biting on the tooth. The intensity of pain varies

among patients. Sometimes he is worried about the mobility of the tooth, the change in the position of the crown of the tooth in the dentition with the displacement of fragments. In case of a root fracture, the localization of the fracture line, its direction, displacement of fragments, the state of the periodontium and the alveolar process are radiologically clarified.

Root fractures are rare and severe consequences of dental injuries. With such damage, cement, root dentin, pulp and periodontium suffer. More often, such an injury occurs at the age after adolescence, when the incisor roots are formed, because at an earlier age the alveolar bone is more elastic and this absorbs the impact. When the root is fractured in the middle third, there is moderate mobility of the tooth, its sensitivity to percussion and biting.

Fracture of the crown and root of the tooth. This type of damage is characterized by complaints about the mobility of a part of the tooth, a painful reaction to various types of stimuli. Upon examination, the mobility of a part of the tooth is revealed, the crown of the tooth sometimes turns pink, the tooth cavity is opened.

The X-ray shows a fracture line passing through the crown to the root of the tooth at different depths. If the fracture line of the root is determined only in the cervical third of the root, then the removal of the crown fragment and endodontic treatment of the tooth are performed.

Conclusion. Thus, cases of fractures of teeth were mainly observed in people of working age, more often in men. Fractures of teeth can occur in the crown and neck area, as well as in the root area. The strength properties of teeth increase depending on the order of their location, as a result, fractures of large chewing teeth are relatively rare and occur mainly with fractures of the jaw or its alveolar process. Fractures of teeth can be transverse, oblique and vertical relative to the axis of the tooth. The neck of the tooth means the weakest part of the crown in

terms of strength, and fractures that occur here are usually complete.

Literature.

1. Iordanishvili A.K., Vereteno E.A., Mironenko A.N. Medical, social, economic and legal aspects of dental treatment of people of older age groups. // *Ecology and development of society*. - 2015. - №3(14). - Pp.63-65.
2. Bonfadini I., Pereira J.T., Knorst J.K., Luz P.B., Scapinello M., Hugo F.N., de Araujo F.B., Hilgert J.B. Maternal characteristics, home environment, and other factors associated with traumatic dental injuries in preschool children. // *Dent. Traumatol.* - 2020, Feb. - №36(1). - P. 33-40.
3. Born C.D., Jackson T.H., Koroluk L.D., Divaris K. Traumatic dental injuries in preschool-age children: Prevalence and risk factors. // *Clin. Exp. Dent. Res.* - 2019, Jan 30. - № 5(2). - P. 151-159.
4. Fisher J., Selikowitz H.S., Mathur M., Varenne B. Strengthening oral health for universal health coverage. // *Lancet*. - 2018, Sep 15. - №392(10151). - P. 899-901. doi: 10.1016/S0140-6736(18)31707-0. Epub 2018 Jul 25.
5. Glendor U. Aetiology and risk factors related to traumatic dental injuries--a review of the literature. // *Dent. Traumatol.* - 2009. - №25(1). - P.9-31.
6. Islamov Sh.E., Makhmatmurodova N.N. Improper provision of medical care in the activities of an obstetrician-gynecologist // *Bulletin of the Tashkent Medical Academy*. - Tashkent. - 2019. - № 1 - P. 73-76.
7. Lam R. Epidemiology and outcomes of traumatic dental injuries: a review of the literature. // *Aust. Dent. J.* - 2016. - №61 Suppl 1. - P.4-20.
8. Makhmatmuradova N.N., Aralov N.R., Safarova M.P. Clinical and immunological characteristics of non-specific interstitial pneumonia // *Scientific and methodological journal "Achievements of Science and Education"*. - № 13 (54). - 2019. - Ivanovo. - P. 117-120.
9. Petti S., Glendor U., Andersson L. World traumatic dental injury prevalence and incidence, a meta-analysis - One billion living people have had traumatic dental injuries. // *Dent. Traumatol.* - 2018, Apr. - № 34(2). - P.71-86. doi: 10.1111/edt.12389.
10. Roh B.Y., Lee W.J., Seo J.U., Lee U.Y., Lee S.S. Analysis of forensic odontological examinations at the National Forensic Service of Korea from 2011 to 2015. // *Leg. Med. (Tokyo)*. - 2018, May. - № 32. - P. 37-42.
11. World Health Organization. [Universal Health Coverage, Fact sheet](https://www.who.int/health-topics/universal-health-coverage). Published 2018. Accessed 7 May, 2018. <https://www.who.int/health-topics/universal-health-coverage>.