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THE STRUCTURE OF THE HARD TOOTH TISSUE IN THE FORMATION OF DISEASES OF THE ORAL CAVITY CHANGES IN THE ASSIMILATION PROCESS IN THE BODY OF CHILDREN WITH ENAMEL HYPOPLASIA

Sharipova G.I.
sharipova.gulnihol@bsmi.uz
https://orcid.org/0009-0009-0825-0534
Head of Department of Hygiene No. 2, Bukhara State Medical Institute, DSc., associate professor
Tursunova D.Sh.
Bukhara state medical institute named after Abu ali Ibn Sino, Uzbekistan. dilnoratursunova49@gmail.com
https://orcid.org/0009-0009-5738-1071
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ABSTRACT

The prevalence and incidence of dental defects depend on a variety of factors, including an individual's race, geographical location, and gender. Scientific studies demonstrate that enamel defects occur in approximately 33% of the population, which underscores the importance of dentists' awareness of these disorders and their ability to effectively inform parents.

The classification of dental defects is based on the various structures involved in the pathological process. In cases where all parts of the tooth are affected, they speak of a "structural defect" that can lead to a change in the shape and size of the tooth, as well as the absence or appearance of additional teeth. Classification schemes can also be based on an etiological factor, such as genetic predispositions, congenital conditions, or environmental influences. For example, genetic factors can influence the shape and structure of teeth, while events during pregnancy or childbirth can lead to congenital dental defects [2,8]. Environmental factors, such as the fluoride content in drinking water, can also be a cause of dental defects [4].

The purpose of this scientific article is to conduct a comprehensive analysis of the pathogenesis and clinical manifestations of dental development disorders in order to identify key factors influencing these processes.

The formation of the dental bud begins at 6-7 weeks of embryogenesis and passes through several key stages: kidneys, caps and bells. At each of these stages, there is an active interaction between ectodermal and mesenchymal cells, which in turn leads to the laying of the main dental structures. Finally, the periodontal ligament connects the tooth cement to the bone, performing both supporting and trophic functions. Thus,

all these processes are strictly regulated by genetic and molecular mechanisms, which guarantees the full and consistent development of teeth [5,6,7].

Dental defects can affect both individual teeth and their totality, and can also be localized or generalized. In the context of enamel, pathologies such as enamel hypoplasia and amelogenesis imperfecta are distinguished, in which various types of defects are observed [8].

Dentine defects include dentine dysplasia and dentinogenesis imperfecta. In addition, cement pathologies such as hypercementosis, hypocementosis and acementosis are also considered. Some defects may cover all tooth structures, for example, aplasia or regional odontodysplasia (odontogenesis imperfecta). Segmental odontodysplasia also deserves attention, especially due to its frequent localization in the alveolar process of the maxilla. Each type of defect has unique characteristics and can lead to various problems related to dental development and health, which highlights the need for a thorough diagnostic approach and comprehensive treatment [9,10].

The size and number of teeth can vary from the norm, and this can be classified as macrodontics (teeth larger than normal), microdontics (teeth smaller than normal) and short roots (roots do not reach the norm) [11]. Hyperdontia (excessive number of teeth) and hypodontia (insufficient number of teeth) are often observed in different peoples and are often associated with syndromes. Tooth discoloration can have different variations, including chalky white, snowy white, gray, black, brown, blue, yellow, and red. These color changes can be caused by various factors such as food, vitamins, minerals, excess fluoride, systemic diseases, cystic fibrosis, fever, jaundice, dehydration, medications, dental injuries and infections, as well as birth defects of enamel and dentin. In recent years, the number of cases of tooth discoloration caused by tetracycline has decreased significantly [12,13].

The etiology and stages of tooth development determine the outcome of a tissue defect. Genetic defects affect the entire tissue because they are continuous, while defects caused by the environment are determined by the time and duration of exposure to environmental factors. Any disruption in the processes of tooth development can lead to defects proportional to the severity and time of the injury. Violations of the number of teeth can cause anomalies of occlusion, function and aesthetics. Hyperdontia is when the number of teeth exceeds the norm, and hypodontia reduces the normal number [1,5].

Hypodontia can manifest as missing or multiple missing teeth. Cases of hypodontia and oligodontia are most often associated with syndromes in which other organs are affected. An example of such a syndrome is ectodermal dysplasia, in which affected patients have a small number of deformed teeth. In most cases, these teeth are located in the anterior part, while teeth in the premolar and molar regions are absent [13]. The various types of additional teeth and their location in the upper or lower jaw are of considerable interest in dental practice. Some of these teeth have an excess

number, including conical, tuberculous, or additional teeth, which are often found singly or in pairs on the palatine side of the upper incisors[3].

These anomalies may interfere with the proper placement of primary teeth and in some cases require their removal. Accurate diagnosis is necessary to identify the cause of delayed eruption of permanent teeth, and the optimal time for surgery avoids damage to developing permanent teeth. In situations where an additional tooth erupts near the molars, the decision to remove it is based on the prediction of the most favorable orthodontic result. In particular, paramolar teeth can be considered as a possible replacement for destroyed molars[2,4]. Radiography often plays a key role in detecting and evaluating the presence of such teeth, which contributes to accurate treatment planning and minimizing complications [3,7].

Natal teeth are teeth that are present in the oral cavity already at birth, whereas neonatal teeth erupt shortly after birth. The frequency of occurrence of these teeth varies from 1 in 700 to 1 in 6000 cases. In most cases, natal and neonatal teeth are normal molar central incisors of the lower jaw. However, their appearance is sometimes associated with certain syndromes and conditions, such as Ellis-Van Creveld syndrome or Rigi-Fede syndrome. Removal of natal and neonatal teeth may be necessary in cases where they cause pain during breastfeeding, lead to ulcerative lesions of the tongue, or pose a threat to the respiratory tract. However, in most cases, efforts are made to preserve these teeth [4,6]. Newborns may also have fibroepithelial embryonic remnants, such as "gingival cysts of newborns", "Bohn's nodules" or "Epstein's pearls", which usually resolve on their own within a few months without requiring medical intervention[2].

Although there are minor differences in tooth size between different racial and gender groups, there are cases where changes in tooth size are due to genetic factors, which may be related to changes in jaw size. Increasing the size of teeth, known as macrodontia, and decreasing the size, called microdontia, are important aspects of dental pathology. The maxillary central and lateral incisors have certain standard dimensions, and any deviations in the direction of enlargement are considered pathological. Lateral incisors often serve as an example of microdontia [5,8].

The shortness of the tooth root, which can occur due to the effects of environmental and genetic factors, special attention is paid to radiotherapy and dentinal dysplasia, which can significantly affect the formation of the roots of teeth and lead to their shortening. These abnormalities require careful diagnosis and appropriate treatment, given their potential impact on the general condition of the maxillary system[3]. Dental morphological disorders such as dens invaginatus and dens evaginatus are significant abnormalities in dental development that require special attention and treatment. Dens invaginatus, also known as "tooth in tooth", manifests itself in the form of invagination of enamel and dentine inside the tooth, most often found on the lateral incisors. This disorder can lead to problems with the pulp and, in the absence of timely

intervention, to the development of inflammatory processes. On an X-ray, this pathology may look like an inverted tooth embedded inside another tooth [4].

Dens evaginatus, in turn, is characterized by a protrusion on the tooth surface, which is most often found on the lower premolars. This protrusion may contain dentin and pulp, making it vulnerable to damage and caries. Both morphological disorders require specialized treatment, which may include root canal examination using an operating microscope, fissure sealing, or restoration to prevent caries in the invagination and coupon areas. Depending on the degree of damage, pulpotomy or pulpectomy may be required, as well as fluoride therapy to strengthen the enamel [5]. These morphological abnormalities can have a significant impact on the occlusion, function, and aesthetics of teeth, which underscores the need for their timely detection and an integrated treatment approach. Pin-shaped lateral teeth, characterized by a conical shape and reduced size, represent a significant aesthetic problem in the oral cavity[3].

References:

1. Alferova E.A. Prevalence of hypoplasia of primary teeth in children // Medicine and Healthcare: Proc. III Int. sci. Conf. (Kazan, May 2015). Kazan: Buk, 2015. pp. 29-31. [Electronic resource]. Access mode: https://moluch.ru/conf/med/archive/154/7498/ (date of access: 03/05/2021).
2. Barakhovskaya E.E. Systemic enamel hypoplasia // Young scientist, 2020. No. 3 (293). pp. 92-95. [Electronic resource]. Access mode: https://moluch.ru/archive/293/66525/ (date of access: 03/05/2021).
3. Hypoplasia of tooth enamel // Expert journal on dentistry Startsmile. 2019. [Electronic resource]. Access mode: https://www.startsmile.ru/detskayastomatologiya/gipoplaziya.html/ (date of access: 05.03.2021).
4. Kosyreva T. F., Pronyaeva A. I. Classification and prevalence of enamel hypoplasia // Pediatric dentistry and prevention. - 2013. - Vol. 12. - No. 2. - P. 23-27.
5. Krikheli N. I. Methods of dental treatment in patients with enamel hypoplasia // Perm Medical Journal. - 2006. - Vol. 23. - No. 6. - P. 103-106.
6. Kibrotsashvili I. A. Clinical presentation, diagnostics and treatment of enamel hypoplasia and similar dental diseases in children and adolescents // Abstract of Cand. Dissertation, St. Petersburg. - 2007. - Vol. 168.
7. Krikheli N. I. Methods of dental treatment in patients with enamel hypoplasia // Perm Medical Journal, 2006. No. 6. Pp. 103-106.
8. Kosyreva T.F., Pronyaeva A.I. Classification and prevalence of enamel hypoplasia // Pediatric Dentistry and Prevention, 2013. No. 2 (45). Pp. 23-27.
9. Kabulbekov A.A. Prevention of dental caries in children with enamel hypoplasia // Science of Life and Health, 2012. No. 2. pp. 79-80.

10. Lunitsyna Yu.V., Tokmakova S.I., Pleshakova T.O., Kosilova A.S., Oskolkova D.A. Prognosis, clinical features and treatment of systemic hypoplasia of permanent teeth complicated by the carious process // Problems of Dentistry, 2013. No. 3. pp. 28-30.
11. Mansur Yu.P. Features of orthodontic treatment of patients with systemic enamel hypoplasia // Volgograd Scientific Medical Journal, 2009. No. 2. pp. 42-43.
12. Ozhgikhina N. V., Kiselnikova L. P., Shcheplyagina L. A. Possibilities of endogenous caries prevention in children with systemic enamel hypoplasia of permanent teeth // Pharmateka. - 2015. - Vol. 11. - No. 304. - P. 68.
13. Russkikh I. S. Basic concepts of non-carious lesions of teeth. Fluorosis mottling. Hypoplasia. Erosion. Increased abrasion // International Student Scientific Bulletin, 2020. No. 1. [Electronic resource]. Access mode: http://eduherald.ru/ru/article/view?id=19881/ (date of access: 03/05/2021).