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Physiological and Pathological Acspects of Tooth Eruption and Formation of Oc Lusion in Children: A Literature Review

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Teething is a physiological process stage by the appearance of milk, then permanent teeth in children. Tooth eruption is its axial movement from a non-functional position in the bone tissue of the jaw to a functional occlusion. The dynamics of this process depends on the degree of formation of the root, periodontium and is closely related to the development and growth of the craniofacil complex [1,20].

Depending on the current mechanism of delay of tooth eruption, impact and an eruption are classified: impact (impact-collision) is a delay of tooth eruption associated with the presence of a mechanical obstacle. The cause of this pathology may be a lack of space in the dentition against the background of crowding, the presence of a mucous barrier, super complete teeth and others; an eruption (an eruption-lack of eruption, absence of eruption) is the primary violation of the process of eruption of non-ankylosed te th with complete or partial absence of growth [20].

It is known that dental rudiments appear in the fetus at about 6-week of fetal life. For another 1.5 months, the process of mineralization of bone tissue occurs. During this period (up to 13 weeks of pregnarcy), the fetus takes calcium, phosphorus, protein and other substances necessary for its teeth from the mother's body [10, 26, 36]. In this period, various diseases, improper nutrition, taking some medications (for example, antibiotics of the tetracycline group) causes fetal anomalies in the number and shape of dental crowns, violate the strength ad color of their enamel. By the time the child is bom, the crowns of 20 milk teeth are located in the depth of the alveolar processes of the jaws in a fully formed state. The process of their eruption is a kind of gradual increase in their volume and pushing out, in which they overcome theresistance of bone tissue, mucou membrane. At this time, the gums become wollen and sensitive [13, 27].

Teeth erupt in a certain sequence, the order of teething is violated in some diseases: rickets; genetic syndromes; lack of bookmark dental rudiments as a result of complicated pregnancy; endocrine pathology [21,47].

Zakharova I. N. believes that the eruption of milk teeth are influenced by various factors. The main importance in the process of teething is the human genotype, its constitution, while it is impossible to exclude the role of various external environmental factors.

The authors believe that the teeth of older parents' children erupt earlier than the children of younger parents. In first-born teeth begin to erupt earlier than in second and third children, in girls this process starts earlier than in boys, there is a direct relationship between the degree of prematurity of the child and the timing of teething of milk teeth. Features of the course of pregnancy in the mother also affect the physiology of teething.

Violations of the processes of eruption and change of teeth can be noted in pituitary pathology, refusal of breastfeeding, frequent acute respiratory diseases, pneumonia, sepsis of the newborn [19, 29].

At the present stage, it is still important to study the age-sex and regional characteristics of eruption of permanent teeth as an important indicator of biological maturity and health of children. It is necessary at planning, realization of actions for prevention of violations of biological development Physiological and pathological aspects of teething and formation among the child population. This opinion was also reached by A. G. Watlin, V. M. Chuchkov. [11].

Arkhipova Yu. a., Timchenko V. V. [4] determined the timing of teething 156 children of the first year of life born to HIV-positive women. It is established that perinatal HIV infection contributes to the

delay of teething in children. Similar results were obtained in their studies Aldrovandi G. M. [37] and Jsanaka S. [43].

Teething is an indirect indicator of the correct development of the child. As a physiological act, teething is not a painful phenomenon, does not cause pathological conditions. It is in direct connection with the General health of the child, timely in a certain sequence the growth of teeth indicates the normal development of his body [3, 30].

Galonsky V. G. presented the results of studying the process of eruption of temporary and permanent teeth in children in Krasnoyarsk. Determined by the sequence and the average time of eruption of the teeth, temporary occlusion in view of the age ranges. The characteristic differences in the timing of eruption of temporary and permanent teeth in boys and girls, as well as regional characteristics of these indicators among the surveyed contingent of children were noted.

Bimbas E. S. carried out determination of terms of eruption of permanent teeth in early replacement bite at children of primary school age of Yekaterinburg. Some discrepancies with the standard terms of teething have been identified, which indicates the need to clarify them in each region. The sexual differences in the eruption of permanent teeth deserve attention. All children were observed asymmetric eruption of the upper incisors. Similar results were obtained Feraru V studied Romanian children.

Ayupova F. S. [5] studied the sequence of eruption of canines and premolars in 216 children aged 7-12 years. In children of the main group, caries of temporary teeth was combined with a violation of the location of permanent teeth and rudiments, deformation of dental arches, violation of the timing and sequence of eruption of permanent canines and premolars. In her other studies, Ayupova F. S. [6] studied 998 medical records of children 3-10 years old who applied for orthodontic treatment for the period from 2003 to 2012. It was found that the prevalence of secondary adentia in children of the Krasnodar region, who sought orthodontic care, reached 31.27%. The structure of prematurely removed temporary teeth was dominated by upper incisors, first molars, lower canines and their combination. Sexual differences in the structure of prematurely removed teeth and their localization according to the quadrants of the dental arches were not revealed.

Denisenko D. V., Yanovsky L. M. [17] analyzed the modern aspect of studying the age of eruption of permanent teeth in children of different regions. The authors propose common criteria for evaluating the process of eruption of permanent teeth.

Starchenko I. I. [33] on the basis of morphological studies gave a comparative characteristic of the rudiments of the first and second human milk molars at 10-12 weeks of fetal development. In the studied period in the rudiments of the first milk molars, the early stage of the period of formation and differentiation of dental rudiments was observed. The rudiments of the second molars significantly lagged in development from the rudiments of the first molars and were at the stage of laying the dental rudiments. It is suggested that there is a direct correlation between the degree of maturity of the rudiments of milk teeth in the early stages and the timing of eruption of the corresponding milk teeth.

Iordanishvili A. K. cite the data of dental examination and study of cone- beam computed tomograms of jaws of 93 men aged 18-27 years in order to study anatomical and metric characteristics of upper and lower jaws during eruption or retention of wisdom teeth. As a result of the study, the features of the anatomical structure of the alveolar process of the jaw in the region of the tubercle of the retro molar space on the lower one during eruption and retention of molars were clarified.

Correctly and in time formed bite plays an important role in the normal development of the child's body. Violation of teething can lead to the formation of malocclusion in children [30, 38].

Terekhova T. N. [34] presented the norms of functions during the formation of the bite, described possible violations, the influence of bad habits on the formation of the maxillofacial region. She pointed out methods for eliminating bad habits and normalizing the functions of the dentition system,

which contribute to the proper development of this system in children and prevent the development of persistent dentition anomalies and deformities.

Vodolatsky M. P., Vodolatsky V. M. [12] studied the nature of malocclusion in children and adolescents according to the results of dental examination of 2676 preschoolers and schoolchildren of Stavropol 4-17 years. The study of the dynamics of deviations of the dental arches and the apical basis of the upper and lower jaws in children aged 3-6 years and presents the morphological characteristics of the dentition, in which there are 2 phases- stable and labile, preceding the change of teeth.

For various reasons, a number of deviations may occur in the structure of the teeth, their location and development [5, 14, 19]: the absence of a tooth rudiment, the wrong position of the tooth axis (horizontal and oblique), why it erupts outside the arc of the dentition or remains in the thickness of the jaw bone, the wrong formation of the tooth itself size, shape, position, color, lack of enamel coating.

The reasons for the delay in teething, is considered [2, 20, 22]: adentia (in the fetus in utero, under the influence of various factors, the process of formation of dental rudiments is disturbed) and retention (not teething). The cause of adentia may be the melting of individual rudiments of permanent teeth as a result of an inflammatory process around the roots of the baby teeth or a destructive process. Multiple congenital absence of teeth leads to a violation of the position of the teeth and functional overload of some of them, underdevelopment of the alveolar process, a decrease in the height of the bite, aesthetic deviations.

The degree of severity of these disorders depends on the number of missing teeth on each jaw, belonging to the group of front or side teeth, the presence of delayed milk, concomitant disorders [28, 40].

Functional and aesthetic disorders increase with increasing number of missing teeth and pairs of antagonists [1, 30]: functional abnormalities include disturbances of food biting, disorders of chewing, prokusyvanie side portions of the tongue and cheeks, reducing the height of occlusion and the mandibular displacement forward, to the side, parafunction muscle okolorotova the region, infantile swallowing, bad habits, wrong pronunciation of sibilants and unvoiced sounds, the incorrect articulation of the tongue at rest and during function, the omission of the back and base of the tongue;

- aesthetic deviations include changes in the face and profile of the face, which are manifested by a decrease in the height of its lower part, thickening of the lips and turning their red border, deepening of the supramental sulcus with neutral or distal occlusion, sinking of the upper lip and smoothness of the nasolabial folds with mesial occlusion.

Often, the adentia of more than 10 teeth is combined with a violation of the development of ectoderm derivatives (ectodermal dysplasia), manifested by a decrease in the hair of the head, underdevelopment of eyebrows, eyelashes, nails, dry skin, its folding and pigmentation. Sometimes there are changes in the lens, iris, overgrowth of tear ducts, violation of the Central nervous system (CNS). These changes are most pronounced in anhidrotic ectodermal dysplasia [34].

The most informative method of rentgenological examination of the jaws, which allows to identify the adentia of individual teeth in different age periods of the formation of the tooth is orthopantographic study [15]. In addition, the method of computed tomography showed a positive side [31, 45].

It is proved that in multiple adentia it is necessary to provide dental care as early as possible. Since children lag behind in growth due to the fact that the body absorbs food poorly, which are due to difficulties in its reception, grinding, moistening with saliva. Children who do not have enough teeth, are not sociable, easily vulnerable and excitable, deeply suffer from their pathology [6, 7].

It is established that the cause of retention may be filling the channel prematurely torn milk tooth adjacent tooth, improper placement in the jaw of the permanent tooth. The presence of impacted teeth can lead to complications as the pathology becomes the cause of neuralgic pain in the face [8, 41].

One of the reasons for the delay in teething may be the presence of a follicular cyst. In this case, treatment in the form of surgery will be preceded by radiography [30].

In connection with the incorrect bookmark follicles supernumerary teeth are often impacted. In 67% they erupt in the dentition or with deviations from it, and in 33% they remain retinated. Most impacted teeth are arranged horizontally or rotated to the side of the nasal cavity [1, 42].

In 90% of cases, super complete teeth cause various complications in the dental system, causing anomalies, inflammatory and dystrophic changes in the surrounding tissues. The most common are chronic inflammation of the mucous membrane in the area of the super complex tooth, periodontitis and resumption of the roots of neighboring teeth, follicular cysts, sometimes super complex teeth cause rhinitis, sinusitis, osteomyelitis. Quite often, super complete teeth cause speech and chewing difficulties, injure the lips, Physiological and pathological aspects of teething and the formation of the tongue and mucous membrane of the oral cavity [32, 39]. The most characteristic anomalies in patients with super complete teeth are anomalies of position, retention, false diastema and crowding of permanent teeth.

Complications caused by impacted teeth are symptomatic neuralgia of II, III branches of the trigeminal nerve, caries and pulpitis delayed tooth that is causing acute pain, dental caries and delayed tooth pulpitis, acute and chronic periodontitis of the adjacent tooth, with acute odontogenic osteomyelitis, abscesses and cellulitis, follicular cysts, Kolokolnaya cysts, adamantinoma . [29].

Malocclusion occurs due to uneven growth of the jaws, due to prolonged sucking of the nipple. Anomalies of dentition arise for constitutional reasons (the small size of the jaw), because of injuries, congenital metabolic disorders of connective tissue, with tumors of the alveolar process of the jaw. The absence of teeth until 1 year extremely rarely stems with adenitis. Check the presence of dental rudiments can be using a special method of radio visiography [1, 2, 30, 44, 46].

Ilyenko L. I. [23] to improve the quality of life for children with painful teething prescribed Dentokind and viburcol candles. A total of 200 children were examined. The study found that both drugs are effective and safe and can be recommended for the treatment of painful teething symptoms.

Goreva, E. A [16] studied the clinical manifestations of teething in a child, evaluated the effectiveness and safety of the use of "Pans oral first teeth" to relieve teething syndrome in children.

Musabekova Zh. A [29] found that perinatal lesions of the Central nervous system are one of the most urgent problems in children's practice, as they often lead to mal adaptation of the child in the social environment, and in severe cases to disability. Children with neurological pathology received Actovegin intramuscularly in the age dosage. Against the background of treatment with Actovegin in infants with neurological pathology, its influence on teething was revealed.

In foreign and domestic literature, works devoted to the study of the influence of environmentally unfavorable factors on the timing and order of teething, the formation of tooth roots in children are rare.

Inoyatov A. Sh's research [24, 25] is devoted to the study of the influence of environmental factors on the formation of tooth roots in children. The authors point out that if unfavorable environmental factors affect the process of embryogenesis of the maxillofacial region, it will affect the timing and order of teething, as well as the formation of bite in children.

Thus, the process of teething and bite formation is a physiological process, which is one of the important indicators of the health and physical development of the child. However, there are a number of factors that have a negative impact on this process and creates an opportunity for the development of the pathological process. In this regard, despite numerous works of domestic and foreign researchers on this topic, the development of methods of early diagnosis, prognosis of the course and outcome of the pathology of teething and bite formation in children remains relevant and in demand.

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