

MATHEMATICAL SUBSTANTIATION OF MODELING THE OCCLUSIVE SURFACE OF TEETH

K.K.Melikuziev, V.E.Kim

Tashkent state dental institute

qahramonm@bk.ru

In the manufacture of crowns, fillings and restorations teeth need to be restored to their anatomical shape, and especially the size and configuration of the bumps. It is an axiom, and does not require proof, because how the better the bumps are, the better the process is chewing, and aesthetic standards will be better restored. A. Motsch (1978) gives 10 signs harmonic occlusion, the most important of which for chewing process, considers proper recovery cusps of teeth, which will provide high chewing efficiency at minimum flow kinetic energy of muscles. This position has been proven at one time method -house mastication (I.S. Rubinov, 1970, B.K. Kostur, 1972).

Physiological and functional oriented fissure -cusp relationships direct chewing force in the direction of the axis of the teeth. A good example to illustrate this point is is the condition of the teeth, periodontium and masticatory muscles patients with severe pathological attrition teeth. As a rule, in such patients, chewing tooth surface is smooth platform. There is marked hypertrophy both m. masseter and other masticatory muscles. Why is this happening? It must be assumed that the absence of tubercles of teeth reduces the efficiency of the chewing and grinding process food. As a result, in order to achieve the final result, the patient must make great efforts, shifting the load on the chewing muscles that we see in the clinic in the treatment of patients with pathological abrasion, bruxism, in which there is hypertrophy and a sharply increased tone of chewing muscles. According to H. Graf (1969) OK duration of tooth contact top and bottom jaws when chewing and swallowing averages 17 min. within 24 hours, i.e. days. At the same time, the number possible occlusion of teeth in central occlusion is from 750 to 2500 times. All this presupposes optimal occlusal relationship with physiological orthognathic bite. V.E. _ Krekshina (1983) believes that during the day the contact of teeth antagonists when chewing is 90 minutes. According to V.A. Polyantseva et al. (1989) load duration on the teeth, created by chewing and swallowing, is an average of about half an hour a day (no more than 2 hours) With bruxism, and as a result of it, pathological tooth wear time increases dramatically. All biosystems of the body work according to uniform laws, the most important of which is the law self regulation / adaptability /. The essence of it consists of that if there were violations in one link of the system, then perestroika begins immediately in its other links as well. Diverse and individual features of the function in masticatory system proceed as self-managed and self-regulating, and by cybernetic principles. (R. Slavichek, 2008). Man and animal have a kinesthetic sense, with which registers the position and voltage their muscles. In the dental system, this the recording apparatus is the receptor apparatus periodontal. Every change in biostatics (shape, position, strength) and in biodynamics (movement, speed) reflected by the degree of influence and an increase in the nervous and energy costs throughout

the system. Clinical observations and literature data strongly suggest to frequent disorders of one or another link of this system: bruxism, dysfunction of the temporomandibular joint, occlusal disorders, periodontal diseases, etc. it different manifestations of the functional pathology of the function dento -jaw system, manifested during the act of chewing. The shortest way to normalize chewing function is correction and correction of the occlusal link. Occlusal surface of natural teeth - part of the tooth surface from the tops of the tubercles to the deepest section of the central fissure and has the following elements: tops of tubercles, their bases, slopes, ridges, triangular ridges of slopes of tubercles and limiting so called the occlusal table marginal pits, central and additional fissures (V.A. Khvatova , 2005).

During a person's life, occlusion undergoes constant change as in normal the formation of dentition, the standard of which is orthognathic bite, and, in particular, with various pathologies of the dentoalveolar system. From the standpoint of a systematic approach to treatment, occlusion is link of the dental system, which is relief of the chewing surface of interlocking teeth rows. Occlusion is subject to pathological changes. Any therapy with the replacement of hard tissues of the tooth with artificial materials, tooth extraction (change position of the tooth), dental orthopedic treatment, as well as surgical interventions in the maxillo- the facial area is always accompanied by a change occlusal relationships. violations in the occlusal link can occur due to caries, abrasion dental tissue, masticatory muscle hypertonicity , loss natural teeth. Physiologically correct reconstruction of occlusion remains one of the cardinal requirements for each dentist and dental technician. As R. Slavichek (2008) writes, "deliberate declining importance of occlusion in modern scientific publications is unacceptable, and existing theories occlusion and articulation require serious revision" and it is difficult to disagree with this point of view. The smallest, micron-sized interference with premature contact of teeth, can cause functional disorders in patients (most often pain dysfunctional syndrome = TMY - syndrome).

Occlusal contacts can be comparable in size with a needle point. Occlusal relationship change with each dental intervention. Therefore, regular monitoring of occlusion and a clear understanding of the coordinated function of the dentition in static and dynamic state are the fundamental prerequisites for a quality dental care. It is empirically clear that treatment of worn teeth, it is necessary to restore fissure - tubercular relationship of teeth and achieve high chewing efficiency. About it convincingly and clearly showed in his studies S.D. Schwartz (1971). At the same time, to date, the study of the area the surface of the teeth with and without tubercles was not given special attention. It is necessary for scientific substantiation of both the effectiveness of chewing and expediency of restoration of masticatory tubercles, the absence of which leads to bruxism , hypertrophy masticatory muscles and imbalance of neuromuscular regulation of the human masticatory apparatus. Looking at this seemingly banal question reconstruction of worn tubercles of natural teeth scientific point of view, it turns out that it is possible to convincingly formulate the mathematical basis restoration of the anatomical shape of the teeth. For this it is necessary to imagine the occlusal surface of the erased molar in the form of a flat,

even square area with side (A), where the area of the square (S) will be equal to ($S = A^2$) and compare with tooth surface with normal chewing bumps.

Theoretical justification is based on the graphical construction of the model of the tooth surface in the form of four regular pyramids (figure 1, side view; figure 2, top view).in contact with each other, the area, which S is determined by the formula: Where: a - side of the pyramid; H is the height of the pyramid, and the area of one face of the pyramid S is determined by the formula: The degree of abrasion of a part of the tooth surface - according to the formula: where: $A = 2a$, and the area of the tooth surface model, taking into account the degree of abrasion, is calculated by the formula:the height of the face H1 is determined by the formula: where a is the side of the base of the pyramid; H is the height of the pyramid; the area of one face is determined by the formula:and the area of the tooth surface model is determined where S is the area of the tooth surface model, and the degree of abrasion of the upper part of the tooth surface is determined by formula: where is the amount of abrasion of the upper part tooth surface, $A = 2a$ - side of the base of the tooth.tooth surface model, taking into account the degree of abrasion, is determined by the formula:

Let us give an example to compare the area of the surfaces of an erased and normal tooth with preserved cusps. For example : the parameters of the bump are - a = 4 mm; H = 2mm The surface area of the worn tooth will be: $S = 2a \cdot 2a = 4a^2$, less and is $4 \cdot a^2 = 64\text{mm}^2$. Thus, when the teeth are erased, the area decreases. occlusal surface of the teeth, aggravating the pathology chewing system. Mathematical substantiation of the need to restore the natural shape of the bumps teeth, is a scientific contribution to the theory and practice dentistry and the basis for further research morphology and function of the dental system.