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PROVISION OF PHYSICAL FACTORS IN FIXATION OF FULL DENTURE

Abstract: Research work comprises orthopaedic treatment with full removable plaque-prostheses of 52 healthy patients (26 men, 26 women) at the age of 45-86 subjected to postprimary complete adentia by their own options. Orthopaedic examination and treatment have been realized by classic method.

The goal of the research is application of the measured functional size to provide physical factors in fixation of full prosthesis within period of post-primary complete adentia (completely absent dentition).

At the second clinical stage, an individual spoon was fitted to the prosthetic area (Herbs test), the valve zone was created by adding Kerr wax to the edges and the functional size (gauge material: zinc oxide eugenol based-repin (sealer), the second layer of A-silicone (hydrorise)) was taken. Then the full denture prosthesis was manufactured under the certain clinical and laboratorial stages.

While taking the functional size, the dentist pressurizes to the prosthetic area by means of gauge material put into an individual measuring spoon. Keeping in this situation, the patient shapes his/her cheeks and lips moving his/her hand in upper and lower jaws, and forms a side of tongue of lower jaw moving by his/her tongue at the same situation to form the borders of valve zones to be created at the edges of dentures. This supposedly reflects interactions of transition bending with prosthetic edge using the complete plaque-prostheses during the exercised functional actions. However, it is impossible to form the transition bending with complete plaque-prosthesis, mutual relations of mucous membrane at the edge of prosthesis in a size to be obtained with an individual spoon during the exercised function. The distance between a prosthetic area in a size obtained by an individual spoon and the internal surface of size is not the same with the distance between the internal surface of prosthesis foundation and the prosthetic area using the prepared full denture.

Key words: individual spoon, functional cast, prosthetic bed, fixation.

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Introduction

Adhesion, cohesion, surface tension and glutinosity as physical factors relating with fixation of full denture prosthesis, capillary attraction, atmospheric pressure and gravity of prosthesis have special significance [1,9].

The meaning adhesion given at daily stomatological experience is called as a sticking. In

physics, this power maintains the non-similar molecules of two substances together which these surfaces are contact. Two surfaces in adhesion regarding with complete prosthesis, the surface of mucous membrane lain on prosthetic area with internal surface of prosthesis foundation have formed adhesion power pulling similar molecules of two substances due to relief [2].

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Cohesion is power that keeps molecules of oral rinse together. Since oral rinse is a layer between the mucosa and the prosthesis foundation, the pulling of the molecules that form oral rinse to each other is resulted in the mutually adhesion of two substances (the internal surface of the mucosa and the foundation of prosthesis) by effect of the adhesion force [2,9].

Cohesion forces on surface of liquids shape the position named as surface tension. Surface tension is a force formed along one line on liquid. A force of surface tension and the moistening ability of surface are correlative factors to form a force of surface tension. According the studies held the highest surface tension force in liquids is mercury in 475 dyn/cm at ambient temperature. Surface tension force of oral rinse is averagely at limit of 52.862.6 dyn/sm. Surface tension index of water at ambient temperature (20°C) is 72,75 dyn/sm. The spread (dissemination) of liquid over the solid object is indicated by measuring angle of contact between liquid and surface of solid object and expressed as ergs/sm². The more the liquid moistens the solid object moistens, the smaller the angle of contact. Its angle of contact becomes 0° while moistening the object. The angle of contact is 75° at initial contact of oral rinse with prosthesis foundation. It's thereabout as a state of water though oral rinse in contact with acryl foundation lasts one hour, the angle of contact falls down 68°. Said differently, the moistening ascends more [9].

To ensure that the fixation that surface tension force formed becomes quality, oral rinse between the prosthesis foundation and prosthetic area shall be thin and durable. Otherwise stated, the prosthesis foundation shall be complete negative of prosthetic bed, there should not be any cavity between them. To the opinion of Schultz (1921), adhesion, cohesion and surface tension forces become maximum when the thickness of oral rinse between prosthesis foundation and prosthetic area is minimum (10 microns) [2,9].

Capillary attraction –is a force that the liquid surface has risen and sunk, and formed as a result of surface tension. This is called meniscus in regardless of surface shape. Being the meniscus in risen and sunk shape is related with a moistening ability of solid object [1].

The Earth Planet is surrounded by air stratum named as atmosphere. The thickness of this layer is to 10 km. The stratum or layer of 10 km formed air molecules makes certain pressure on every object all over the world. This pressure is 1033gr per every sm² at sea level and this is equal to the pressure formed by of mercury column at 760 mm. Atmospheric pressure is clarified in a such way. The pot filled with water to overflowing, without any air remained inside is covered with paper. The pot is reversed without swinging over. Water is not flown over and poured down. The reason that the outdoor air pressure pushes the paper up, so that the water is not flown down because the pressure is more than gravity of water

inside the pot under this pressure. If there is any distant gap between the edge of pot and the paper, the balance will be disturbed and the water will be overflowed. The core issue to apply this case for complete denture prosthesis is to cover or to tap the edges of prosthesis hermetically to ensure that oral rinse and air bubbles are not moved in [9].

Preparing full prosthesis heavily and its basis thick by various methods may exercise negative effect on other adhesive forces, break fixation of prosthesis. However the denture prosthesis shall be made in conformity with standard requirements. Besides anatomic factors in fixation of prosthesis having complete plaque, physical factors are those which play the main role. In order to common principles, the role of physical factors in fixation of dentures starts after measuring the size from the prosthetic area and preparing construction of prosthesis over them by achieving models or samples due to clinical and laboratorial stages. The internal surface of foundation in construction of prosthesis reflects the relief of prosthetic area, makes allowance for physical factors to provide fixation of prosthesis. Several researching works on advancement of methods have been implemented to provide fixation of the complete plaque-prosthesis [5,6,7,8].

However, in spite of these, to preserve the mutual relations between tissues in lower jaw and upper jaw in which they get in contact, and prosthesis foundation of the complete plaque-prosthesis are in physiological restrictions (borders), to prevent from transition to pathological conditions [3,4] are still considered actual and unsolved problems of stomatology.

The **goal** of the conducted research is consisted of studying the measured functional size to provide physical factors in fixation of full prosthesis within period of post-primary complete adentia (completely absent dentition).

Material and method

Research work comprises orthopaedic treatment with full removable plaque-prostheses of 52 healthy patients (26 men, 26 women) at the age of 45-92 subjected to postprimary complete adentia by their own options. Orthopaedic examination and treatment have been realized by classic method. Atrophic degree of prosthetic area was Schroder I grade at upper jaw (maxillary bone) of 32 patients, Schroder II grade at 20 patients. Atrophic degree in lower jaw (mandibular bone) was Keller I grade at 30 patients and Keller II at 22 patients. Prosthetic area mobility of mucous membrane became the I grade at upper jaw of 35 patients and lower jaw of 31 patients, the II grade at upper jaw of 17 patients and at lower jaw of 21 patients according to Supple classification. We did not include the other grades to make sure that these fail to have negative impact on our results for the cause of majority of atrophic changes into prosthetic area. At

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the second clinical stage, an individual spoon was fitted to the prosthetic area (Herbs test), the valve zone was created by adding Kerr wax to the edges and the functional size (gauge material: zinc oxide eugenol based-repin (sealer), the second layer of A-silicone (hydrorise)) was taken. Then the full denture prosthesis was manufactured under the certain clinical and laboratorial stages.

After wearing and using the dentures for a period of one, six months, the relief coincidence of physical fixation factors with the functional size that we measured was studied putting the second layer of A-silicone (hydrorise) gauge material over the internal surface of prosthesis foundation by wearing into mouth. It was mathematically worked out.

Conclusions and their discussions

It is possible to explain the provision of physical factors in respect with fixation of full denture prostheses as a sample of interactions of two vitreous plaques (boards) at equal sizes. There is proportionality between magnitude of vitreous plaque and adhesion force. Here the main condition is the age of vitreous plaques and distance between them to be equally minimal. In other sense, the bigger the vitreous plaques and more suitable the surfaces, it will be harder to divide them. This large area in full dentures is to be as they will not prevent the functional mobility of the surrounding tissues. Otherwise, the surrounding tissues will fracture the function of prosthesis. Here one of the prostheses is a prosthetic areas, the other is an internal surface of prosthesis foundation. Their coincidence is subject to the measured functional size, the one that moistens is oral rinse. The prepared denture prosthesis was checked and delivered to a patient, after using for a month the prosthesis foundation was washed and drained. The second layer of A-silicone (hydrorise) gauge material was placed inside as a thin coat, it was worn into a patient's jaw and was asked for the patient to act as he, she can unless it hardens. Denture prosthesis was removed from mouth after accomplishing the polymerization period of gauge (measuring) material. It was drained and examined clinically. Transition bending of upper jaw dentures, postdam area and thickness of gauge material at back 2/3 part of palatal area were 5-7mm; at front 2/3 of the upper part of alveolar protrusion were 0.2-0.5 mm, at back 1/3 part were 3-4 mm, on the slope it was recorded 2-3 mm. Transition bending of lower jaw dentures, thickness of gauge material in sublingual area were 5-8 mm, at front 2/3 of the upper part of alveolar protrusion were 0.3-0.6 mm, at back 1/3 part were 3-5 mm and these were 2-4 mm on the slope. It implies that all of dentures were corrected relating with the traumatic damages caused in transition bending, the upper part of alveolar protrusion and the slope, the taken measure restrictions were destroyed. Adaptation of all patients for whom prostheses were made, to full denture

prosthesis was complete in the third period of adaptation.

After using for six months, the patients were taken to clinical examination again, the prosthesis foundation was washed and drained. The second layer of A-silicone (hydrorise) gauge material was placed inside as a shape of thin coat, it was worn into a patient's jaw and was asked for the patient to act as he, she can unless it hardens. Denture prosthesis was removed from mouth after accomplishing the polymerization period of gauge (measuring) material. It was drained and examined clinically. Transition bending of upper jaw dentures, postdam area and thickness of gauge material at back 2/3 part of palatal area were 5-8 mm; at front 2/3 of the upper part of alveolar protrusion were 0.2 mm, at back 1/3 part were 4-7 mm, on the slope it was recorded 2-4 mm. Transition bending of lower jaw dentures, thickness of gauge material in sublingual area were 4-7 mm, at front 2/3 of the upper part of alveolar protrusion were 0.2 mm, at back 1/3 part were 3-6 mm and these were 2-3 mm on the slope.

To maintain the mutual relations between tissues of prosthetic areas in lower jaw and upper jaw which they get in contact, and prosthesis foundation of the complete plaque-prosthesis to be within scope of physiological restrictions (borders), to prevent from transition to pathological conditions depend on effectiveness of the size taken from prosthetic area. This is, in turn, meant that the physical factors ensuring the fixation of prosthesis have been provided.

When a dentist take the functional size from the completely teeth-free jaws, the dentist carries out definite actions actively, the patient does passively to make ensure that the relief of transition bending reflects on size while pressuring to the prosthetic area with a material placed into an individual measuring spoon. These functional actions as if will be fitted to the relief in where the denture generated with prosthesis foundation and prosthetic edge of transition bending when the patient uses denture. But the pressure that the dentist exercised over the prosthetic area by his/her measuring spoon will never be the same with the pressure applied over the prosthetic area by the denture which patient used during different functional actions. Pressurizing the size, we allegedly think that the pressure exerted to prosthetic area by virtue of prosthetic construction will be equal to the pressure that we put onto our individual spoon (repin, a correcting layer of the polymerized gauge material) taking a size when our patient, for whom we made denture, implements different functions.

It is impossible to reflect the prosthetic area at prosthesis foundation and all actions of transition bending t the measuring edge while taking the size by carrying out different functional actions by a gauge material put into an individual spoon. Because it is not available to make reflection of all functional actions

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which the patient will implement while using the denture, at measuring edges taken by an individual spoon. For that reason, the pressure upon prosthetic area changes, a valve zone is broken, makes negative

effect on role of physical factors in fixation of the denture damping oral rinse down and blowing the air under the denture when such the prepared dentures are used.

References:

1. Bayramov, Yu.I. (2012). Znachenie postdamskoy oblasti v retentsii verkhnykh polnykh s"emnykh protezov. *Aspekty sovremennoy nauki*, №1, pp. 24-28.
2. Bayramov, Yu.I. (2013). Neudobstva vyzvannye nosheniem polnykh protezov s nepravil'nymi granitsami. *Sovremennoy stomatologiya*, №4(68), pp.166-167.
3. Vagner, V.D., & Bulycheva, E.A. (2017). Kachestvo stomatologicheskoy pomoshchi: kharakteristiki i kriterii. *Stomatologiya*, №1, pp.23-24.
4. Donenbaeva, Sh.Sh. (1972). *Raspredelenie davleniya ottisknogo materiala na proteznom lozhe i opyt polucheniya ottiskov s bezzubykh chelyustey vo vremeni*:/Avtoref. dis. kand. med. nauk. (p.18). Khar'kov.
5. Luganskiy, V.A. (2006). *Optimizatsiya kliniko-laboratorykh etapov polucheniya ottiskov pri polnom otsutstvii zubov*: Diss...kand. med. nauk. (pp.75-78). Ekaterinburg.
6. Manakov, A.L. (2004). *Kliniko-laboratornoe obosnovanie razrabotki metodiki polucheniya funktsional'nykh ottiskov pri polnoy potere zubov*: Diss... kand. med. nauk. (pp.79-92). Nizhniy Novgorod.
7. Milikevich, V.Yu., & Shcherbakov, V.A. (1974). *Funktsional'nye ottiski pri lechenii bol'nykh s polnym otsutstviem zubov: Metodicheskie rekomendatsii*. (p.23). Volgograd.
8. Savvidi, K.G. (2011). *Optimizatsiya metodov ortopedicheskogo lecheniya pacientov pozhilogo i starcheskogo vozrasta s polnoy poterey zubov*: Diss...dok. med. nauk. (pp.61-71). Tver'.
9. (2004). Senih Çalıkkocaoğlu. Tam protezler./Cilt I.4 Baskı.Ankara, pp.109-114.