

Daytime hospital for children on base of RICP is used for preventive treatment of sick children with chronic diseases, besides, a number of complications of main disease decreases. The taken analysis has shown that during the 3 years of DH operation a number of emergency medical calls for children with chronic pathologies has decreased by 23%, frequency of full-day hospitalization has decreased by 12,8%.

Our calculations have shown that DH treatment costs for kids is 2,3 times lower than that of full-day hospital.

Medical-social efficiency of DH organization is proved by social questionings of parents of sick children. All respondents has expressed a satisfaction with this form of work and considered it to be more suitable in a social scale. Questioning parents and medical workers implied studying respondents' suggestions on how to improve quality of DH services that allowed us to take improvements into organization of DH structural departments work.

The research has established that DH is a positive form of work from the position of medical-social efficiency. However, we should pay attention to DH work in 2 shifts that is important in economic terms, as treatments costs would be lower even lower in two-shifts work regime.

Resume. The works presents an analysis of work of daytime hospital (DH) on base of republican infantile consultive polyclinic (Makhachkala). Medical-social efficiency and economic reasonability of organizing DH for children and teenagers is shown.

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The work was submitted to International Scientific Conference «Fundamental and applied research in medicine», France (Paris), 14–21, October, 2012, came to the editorial office on 19.09.2012.

NEW TECHNOLOGIES IN TREATING PATIENTS WITH DENTAL IMPLANTATION

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The second part of the XX century can be described as the time of acute discussions and disputes between clinicists on reaction of tissue against introduction of an implant and definition of the safest level of its functional strain. The problem of functional strain under inter-bone implantation is urgent, as both approaches, delayed and early strain, have its positive and negative sides (V.N. Olesova, 1986, A.A. Kulakov, 2000).

Research objectives. Experimental-clinic approval of method of early functional strain under dental implantation.

Central scientific-research institute of stomatology and facial surgery has served as the basis for our research.

Clinical part of the work was carried out during treatment of 332 patients in age of 20–70 years, including 228 women and 104 men. Average age of male patients equaled 53 year, women – 49 years. All the studied have been split into two groups after placing implants: the 1st group (234 patients) was formed by patients who had been earlier exposed to functional strain, and the 2nd, control group (98 patients), were treated with traditional methods of implantation with teeth implants.

Operations of inter-bone implantation were carried out on both lower and upper jaw. Distribution of implants according to the selected scheme and their location is provided in table.

Distribution of implants according the selected system and localization

Implant location	Bioimal-implant	LIKO	Astra-Tech	Total
Lower jaw	221	27	25	273
Upper jaw	254	19	27	300
Total	475	46	52	573

Implants of domestic implantation system «Bioimal-implant» have been placed.

While inspecting patients we considered a number of teeth lines defects, atrophy degree of

bone tissue of alveolar sprout, volume and localization of the tooth line defect.

To define recommendations and limitations to carry out surgery of inter-bone implantation, pa-

tients were exposed to clinic-laboratory, radiological, and functional inspection.

During the initial inspection we considered etiology of adention, as the cause of lack of teeth is an important characteristic that indicates a potential risk of complications and defines the treatment forecast. Diagnostic models of jaws and wax biting blocks were made before placing implants in order to define central occlusion. Diagnostic models were used to define implant position and show a patient the construction of the planned treatment method. Dynamic observations were carried out at the basis of clinic-radiographic and functional methods.

At the stage of preliminary inspection of patients who has visited the clinic, and also during the process of dynamic observation the main method of radiological study was orthopantomography (OPTG). OPTG was used at the first visit of a patient and also during control periods after tooth implantation. Data of this method provide us with a large volume of information on the condition of teeth, allow us to reveal the degree of vertical resorptions of alveolar crest, define the location of major anatomic formations of lower jaw channel, upper jaw cavities, and the bottom of nasal cavities. Computer tomography (CT) was used as an auxiliary method.

Orthopantomographies were taken with facilities PM2002, «Kranex», in terms 60–65 kV, 7–10 mA, exposed during 10–12 seconds.

During the research we have analyzed the data of OPTG for all patients with early functional strain in early periods of study before implantation, and after 1,3,6, 12 months, peculiarities of bone tissue formation around the implant have been described.

The study of micro-circulation in area of dental implantation was carried out via method of laser doppler flowmetry (LDF) with an analyzer of capillary blood flow – LAKK-01. The condition of micro-circulation was evaluated according to the index of micro-circulation (M) that characterizes the level of capillary blood flow; parameter – σ that defines variability of erythrocyte flow and variation coefficient (Kv) that characterizes vasomotor activity of microvessels.

Ultrasound osteometry was carried out with echoosteometer EOM-02. Electromyography (EMG) of chewing muscles was carried out with neuromiostome. Evaluation of jaw alveolar part blood supply was taken with the method of rheography with the facility RPKA-02 (MEDASS). Besides, automated computer processing of main rheographic indexes (RI – rheographic index, IVT – index of vessel tone, FI – flexibility index, IPR – index of periphery resistance) were evaluated. Dynamic observations of LDF, EOM, EMG, RG were carried out before placing teeth implants, and after a day, and then after 3, 6, 12 months.

The taken experimental research has established that under simultaneous placing of screw implants with an early functional strain connection-tissue

capsule grows fast around implants, compacts, and fiberizes, and then becomes thin. It testifies for a possible early rehabilitation of patients with partial and complete loss of teeth.

Under early functional strain in area of dental implants we observe formation of bone structures with their further differentiation that ends with compaction of new bone tissue. A presence of thin connective-tissue capsule around implants is a favourable factor that provides for softening in mechanic stress during early functional strain. According to the data of echoosteometry, echo-density of bone tissue grows gradually and restores in 6 months after inter-bone implantation new methodic.

Early functional strain of dental implants provides for a realization of chewing muscles. Normalization of coordinated relations in their work comes in 3 months due to an alteration in bio-electric activity of the very chewing muscles and temporal muscles. Dynamic of regional geodynamics indexed proves the adaptation to early functional strain and complete restoration of regional blood flow in the area of implants in 6 months.

Among patients of the main group a level of tissue blood flow, its intensity and vasomotor activity of micro-vessels has increased by 40–75%. It testifies for a development of hyperemia in micro-circulation bed that cut off in 3 months.

According to clinic-functional research, the method of early functional strain under dental implantation is more effective, compared to the traditional one. It is linked to a strengthening in reparative processes in bone tissue.

At the foundation of the research results, we can recommend gradual implantation right after placing an implant: making of temporary implant construction of plastic directly after placing an implant; making permanent orthopedic construction.

Evidence for early functional strain with the method of dental implantation is: preservation of the volume of bone tissue of alveolar jaw sprout; partial and complete loss of teeth; absence of inter-occlusion height disturbance; presence of keratinized gum; a patient's readiness to take part in post-surgery rehabilitation.

Contradictory evidence against early functional strain under dental implantation is: an expressed atrophy of alveolar sprout bone tissue; a mismatch between the axis of implant and the axis of metal-ceramic crown; absence of keratinized gum; incorrect distribution of chewing strain over the implant, mostly horizontal; unsatisfactory hygiene of oral cavity.

Resume. The article represents results of research on approbation and evaluation of the efficiency of a new methodic of early functional strain under dental implantation.

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MEDICAL INNOVATIONS DURING AN ERA NANOTECHNOLOGY

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The development of medicine in the era of nanotechnology has been reviewed. The hallmark of this time is a broad use of rare and rare-earth metals. The molecular processes of nanotechnologies are similar to those of the origin of life. The genetic code of protobionts contained information about the maintenance of metal-ligand homeostasis and the composition and functions of cell walls and membranes under conditions existing 3,5-4 billion of years ago. Biological evolution resulted in origination of mechanisms:

- 1) a struggle in the form of antioxidant systems against the toxic effect of O_2 ;
- 2) harsh Ca^{2+} homeostasis in the form of I-containing Se-protein hormones.

Interdisciplinary medical bioinorganics is the basis for study of mechanisms of pathological processes. There has been formulated the law of substitution and its consequences for the explanation of the interaction of metals in metabolism. It is possible to predict new understanding of an etiology, pathogenesis and treatments of diseases.

1. The Era of Nanotechnology.

One of the creators of quantum electrodynamics *Richard P. Feynman* in 1959 regarding the supercompact encoding of a tremendous volume of information in biological systems turned out to be of great importance for the advancement of biology (as well as medicine). In his speech «There's Plenty of Room at the Bottom. An invitation to enter a new Field of Physics» at an annual American Physical Society meeting *R. Feynman* forecasted the Era of Nanotechnology in terms of manipulation of matter at the level of single atoms.

Humankind has passed through several periods in its progress – the Stone Era (> 4 thousand years Before the Common Era), the Copper Era(4-3 thousand years B.C.E.), the Bronze Era(before 13/11 centuries B.C.E.), and the Iron Era (before 1959 C.E.). One can easily note that the criterion for the determination of the epochs is the type of material (metal) that was used for making tools and weapons.

In this system of coordinates, the Era of Nanotechnology differs from the Iron Era by its widespread use of rare and rare-earth metals. The elements that have hardly ever been used before are

in extensive use. Computers work on alloys of Si, Ge, As, mobile phones and heterolasers – Ga, Al, As, In, P, the aviation and car industry – Ti, Al, Li, Ce, atomic power – U, Pu, Th, etc. The influence of these elements on the metabolism of organisms and the environment has not been studied enough.

2. The similarity of studying molecular nanotechnology and the origin of Life.

The spontaneous mechanism of adsorption of primary organic molecules on crystals in the prologue of life and the origin of self-replicating molecular machines in nanotechnologies, in particular as applied to the incipency of enantiomorphism, are the same. The application of nanotechnology to the research of the origin of life, and vice versa, can assure success in the creation of manageable synthetic life [1].

Chemical evolution, before biological, had occurred on the basis of chemical reactions, remaining in force to the present time. Biological evolution, followed the origin of protobionts, for various taxon's occurred in parallel response to *changes in environmental conditions*.

At the time of the origin of life, genetic information was inscribed under the conditions that existed 3,5-4 billion years ago. Among them the main ones were *an absence of oxygen in the atmosphere and the salt composition of the primary World Ocean*. It was different from the modern one (pH ~ 0,3 vs. 7,6-8,4 now, the total salinity ~2,5% vs. 3,4-3,7% now, a significant predominance of Na^+ and Mg^{2+}). The content of metals has gradually changed upwards in terms of K^+ and Ca^{2+} proportion in the modern World Ocean. Apparently, during the process of adaptation of the metabolism of living organisms to environmental conditions, yet unknown mechanisms of information coding from the receptors and ionic pumps of membranes of protobionts were engaged.

On the assumption of Curie's principle («dissymmetry creates the phenomenon») the development of protobionts could have not occurred without membranes. The hallmark of Life, as the mode of existence of protein bodies, is the processes of interaction with the environment. The origin of the organisms of various domains and taxon's was determined by the nature and functioning of the substances of the membranes as the only exchange mechanism of energy, information and matter between the protobionts and the environment.

Consequently, the correct theory can only be the theory of the origin of life that supposes the formation of membranes in protobionts. This is the «protein» theory of A.I. Oparin [2].

Coacervate droplets of a polypeptide nature gradually accumulated polymers of nucleotides, porphyrins, carbohydrates, steroids, fatty acids, pyridoxine, and molecules of other classes of organic substances. Presumably, their total number for implementation of vital functions must have been at least 29 [3]. Initially many processes in