TO QUESTION ABOUT OSTEOINTEGRATION DENTAL IMPLANTS AND WAYS HER STIMULATIONS

Safarov M.T., Tashpulatova K.M., Ruzimbetov H.B.
Department of Hospital Orthopedic Dentistry, TSDI.

Abstract: An urgent problem in dentistry remains the reduction number of complications after dental implantation. Once working new techniques surgical interventions usage various ways stimulation osseointegration , creation of new implant systems will help reduce the rehabilitation time for dental patients and improve their quality of life.

Key words: implant, modification surfaces, osseointegration.

IN the present time dental implantation became generally recognized accessible And effective method treatment various forms defects dental rows. However relevant problem dentistry there remains a decrease in the number complications and reduction deadlines _ dental rehabilitation patients. Long-term time treatment And related With this aesthetic _ And functional flaws can be very unpleasant, A Sometimes become reasons refusal from orthopedic restoration on implants [1, 14].

For search ways solutions Problems necessary _ clear understanding process, what's happening on border _ dental implant bone process of osteointegration , discovered And described V 1969 G. Swedish professor PI Branemark. He defined osseointegration How "obvious direct (immediate) attachment or accession alive bone _ fabrics To surfaces implant without introduction of a layer connecting fabrics" [eleven].

On today's day biological Aspects process osseointegration dental implant detail but describes wide famous theory retraction bloody _ clot « Blood clot retraction theory " [eleven, 12], according to which passes sequential divided into three stages reflecting gradual regeneration bones:

– first And most important phase osteoconduction , _ V progress which on surface implant through remainder blood clot around him are attracted to And migrate osteoblasts;

– second phase osteoinduction bone education _ V result mineralization bone matrik sa comes when osteogenic cells reached the surface implant;

– third phase remodeling bones long lasting process With cycles resorption And bone formation , stabilizing Not previously how through 18 months _ after operations dental implantation

IN compound clot, fixed on surface _ implant, besides fibrin, included platelet _ factors growth, epidermal factor growth, with judicial factors growth, insulin-like growth factor And etc. These factors initiate healing bone fabrics, contribute activation macrophages,

strengthen angiogenesis, stimulate education collagen howl matrices, A in relation to To implantation determine fixation implant V bone fabrics [16, eleven]. Herself operation implantation This Not what else like surgery injury, A implant foreign agent. Similar interventions cause primary body response inflammation With typical complex from vascular tissue changes [6, 12, 17].

By data various authors, process education _ bones *de novo* on surfaces implant occurs through contact and distant osteogenesis. At distant osteogenesis bone structure tour is happening with sides superficial layers old swarm bone fabrics V peri-implant areas. This bone _ surface provides region osteogenesis population osteogenic cells, producing new _ bone matrix, oriented V surface direction implant [15, 12].

IN difference from distant osteogenesis, at contact no. osteogenesis neoplasm bone substance occurs directly on surfaces the implant itself . This mechanism is implemented By analogies with processes osteoconduction , V progress which surface implant performs role passive matrices for osteogenesis. IN like this case is happening cell migration is precursor surface implant from the outside maternal box, which start differentiate _ V mature osteoblasts, secreting bone matrix on surfaces implant. This process dictates significance V research regeneration _ bone fabrics V peri-implant space quality _ properties surfaces installed implants. Obviously, What V different areas processes of distant and contact osteogenesis in the peri-implant area are happening parallel.

So way, understanding pathophysiology processes around dental implant after his installations , A also body reactions on the implant itself as foreign body, pushes scientists And implant manufacturers To improvement How themselves implantation techniques, So And search funds And methods influence on process osseointegration, V volume number ways its stimulation and acceleration [2].

Stimulation osseointegration This change in kinetics processes V biological fabrics, carried out With purpose reductions deadlines. At stimulation like parts complex process reparative regeneration _ bone fabrics, changes kinetics must take place simultaneously in everyone links single process With taking into account his phase divisions, caused by differentiation direction[13]. In view of Togo, that it's full-fledged osseointegration of a dental implant - process complex, T. Albrektsson _ 1990 proposed a paradigm involving six main factors necessary for its achievements: implantation material; design implant; quality surfaces; orthopedic load; surgical technique; state _ bone fabrics [12].

Introduction term "osseointegration" V dental _ implantation Not only gave development implantology , But And caused some confusion among dentists relatively deadlines And conditions achievements this condition. Numerous research on studying speakers formation osseointegrated contact subjected doubt And indicate on necessity _ revision traditional And became textbook _ recommendations on deadlines prosthetics after installations dental implants 3 months on bottom And 6 months on top jaws [7, 12, 13].

Near authors already carried out research by impact on process osseointegration on cellular level [5, 10, 13]. So, saturation surfaces porous _ implants rich platelets plasma blood effectively influenced on process reparative radio regeneration bone fabrics [12]. Proven action quasi-static electrical fields on height And development osteogenic _ stromal progenitor cells, which leads to improvement conditions osseointegration [12]. Poroshin A.V. (2014) V his research studied positive dynamics morphostructural peri-implant changes bone fabrics under effects of TES therapy V experiment And clinic [13, 14].

For osteointegration influence various biological physical, chemical factors [8, 19]. So, morphological and biochemical features stages regeneration bone fabrics enough deep studied _ And in detail illuminated V a number of monographs [3]. Exists a bunch of research microi macrostructures _ surfaces dental implants, demonstrating the dependence of qualitative and quantitative indicators osseointegration from features _ relief surfaces implant And her chemical composition [3, 4, 7, 10, 17]. TO parameters, capable influence on osteointegrative processes relate hydrophilicity _ And roughness surfaces.

Hydrophilic surface is more preferred By comparison With hydrophobic, So How observed _ increased ability surfaces im planta to interact With biological liquid bones, cellular elements, What It has special meaning in the early stages of osseointegration [2, 4]. Roughness surfaces V dependencies from its severity Maybe vary V range from mil liter before shares micron, subdividing on mak ro-, microi nanoroughness . IN a number of works about demonstrated, What high degree roughness _ surfaces provides positive Influence at mechanical stability implant How V moment _ his installations, So And V remote deadlines functioning.

Naturally, What quality surfaces And her roughness _ are determined ways processing [3, 12], which are subdivided next way:

1) treatment surfaces implant chemically mi And physical methods (titanium plasma , air -abrasive, acidic And etc.);

2) application to the surface implant bioactive _ substances influencing on osteogenesis V areas of bone-implantation interface (spraying calcium phosphate ceramics, adhesive molecules And T. d.).

A. AND. Kai (2007) was identified application efficiency on surface electret films, influencing _ on square attachments osteogenic stromal progenitor cells of the bone marrow [7]. D. A. Dimitrovich (2009) V experiment revealed high adhesive potential of osteogenic stromal progenitor cells bone brain To surface _ titanium after ion plasma etching [4]. Research _ Sung Am Cho And Sang -Kio Jung (2009) did you show What efforts at twisting implant With laser noah processing higher than in group implants with machine processing [18].

L. R. Khasanova (2010) V experiment, A then and V clinical research dental implants, manufactured from nanostructured titanium grade « Nano-Grade 4", recommends manufacture about the visor orthopedic design already through a week after surgical

interventions [17]. Perikova _ M.G. (2014) V experimental the study was received data, testifying O close connection microrelief surfaces screw dental implants with degree osseointegration [12]. Besides , presenters manufacturers dental all implants more often apply technologies processing surface _ implants drugs calcium. This Straumann company And her surfaces SLA And SLAActive _ surfaces TiOblast And OsseoSpeed companies Astra Tech , surface S.A. And C.A. Osstem Implant [3, 9]. So, company _ « Osstem Implant " (South Korea) held for preparing the surface of a dental implant with a solution, containing ions calcium, A Also storage given implant V similar solution before installations _ V cavities mouth Manufacturer it is stated that calcium ions increase hydrophilicity of the implant And influence on surface activation energy , prevent deposition ions carbon on on the surface implant, What influences on adhesion blood protein . Also ions calcium actively influence on rate of formation proteins blood, formation clot, what contributes growth differentiated cells bone brain osteogenesis. Similar statements have _ confirmation carried out previously research , revealed And proven physiological activity _ ionized forms calcium [3].

Organization surfaces at the nano level plays an important role V regulation processes adsorption on surfaces implant biological substances, ta kih How fibronectin , components damaged cells And blood. The process subsequently affects intensity migration, differentiation And proliferation _ osteogenic cells [2,3,12]. TO unfortunately chemical ways processing surfaces For controlled _ formation surfaces With necessary three-dimensional organization on nanolevel are imperfect . Also unresolved remains question surface selection V context gain adhesion cells ost regional lines on surfaces implant.

So way, problem search optimal technologies implantation is relevant before present _ time And includes Not only development new techniques surgical interventions use of new ways stimulation osseointegration, But And Creation, comprehensive justification efficiency new systems implants, including new methods modification _ their surfaces. Undoubtedly What new achievements V this direction will help reduce deadlines rehabilitation dental patients, improvement quality their life.

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