

CLINICAL ASPECTS OF THE APPLICATION OF AN INDIVIDUAL RECONSTRUCTIVE IMPLANT FROM LYOPHILIZED ALLOGENIC MATERIAL IN SEVERE ATROPHY OF JAW BONE TISSUE

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Abstract : Success comprehensive rehabilitation patients method dental implantation in conditions deficit jaw bone tissue in the area of dentition defects is determined by many factors that play an important role at various stages of treatment. Dental implantation for complex defects of the alveolar bone of the jaw requires preliminary reconstruction using bone replacement materials, the success of which depends on the area contact reconstructive bone implant With autogenous bone fabric, degrees his revascularization And primary stabilization.

Target — extension testimony To dental implantation at expressed atrophy bone fabrics jaws in the area of dentition defects through the use of individual reconstructive implants from lyophilized allogeneic material.

Methodology. Manufacturing of precision reconstructive bone implant from allogeneic biomaterial carried out With with help techniques digital reconstruction, based on building virtual digital 3D models By data computer tomography. For assessments results treatment patient With expressed atrophy bone jaw tissue in the area of dentition defects used general clinical and special research methods: cone beam computed tomography, jaw bone densitometry, periotestmetry ; rheoparodontography ; studying quality life.

Results. The use of a reconstructive implant made of lyophilized allogeneic material leads to an increase in the area of its contact with the autogenous bone tissue of the alveoli, an increase in its revascularization , osteoconductive potential, reducing the likelihood of its rejection and complications in the postoperative period, expansion testimony To dental implantation

Conclusion. Application individual reconstructive implants from lyophilized allogeneic material in case of severe atrophy of bone tissue in the area of defects in the dentition of the jaws, it can significantly expand indications for dental implantation and reduce the total duration of treatment by an average of 6 months due to one-time carrying out augmentations And implantation

Key words: *dental implantation, jaw bone atrophy, alveolar bone reconstruction jaws, individual reconstructive implant from lyophilized allogeneic material*

Introduction

Success comprehensive rehabilitation patients the method of dental implantation in conditions of jaw bone deficiency is determined by many factors that play a role at various stages carrying out treatment [1-11].

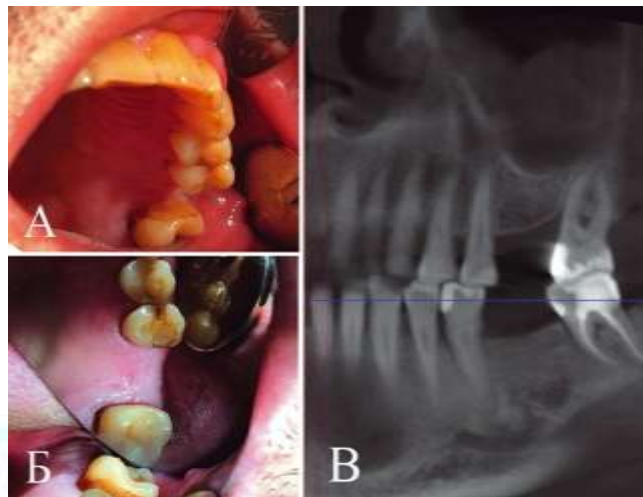
Planning dental implantation at complex in shape horizontal and vertical defects of the alveolar bone of the jaw require preliminary reconstruction With application bone replacement materials, which extends treatment time on 6-8 months [12-22].

At ensuring stability used material important How primary mechanical, So and biological fixation, that is, processes of osseointegration , leaking V region contact With recipient bone cloth. Obviously, What how tighter fit material To region defect And how more square their contact, those more optimistic forecast bone reconstruction [23, 24]. This dictates the relevance of creating technologies construction individual boneimplants that expand indications for dental implantation, allowing individually restore volume bone fabrics And creating favorable conditions For integration dental implant, ensuring proper placementosteotomies of the bone bed of a dental implant without additional manufacturing surgical template for achieving high anatomical and functional And aesthetic results reconstructive treatment [25, 26].

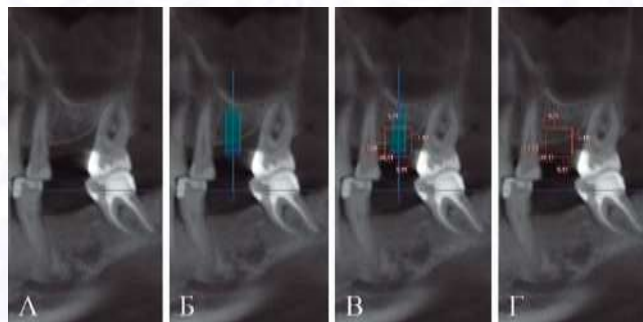
Target work — extension testimony To dental implantation at expressed atrophy jaw bone tissue through the use of individual reconstructive implants from lyophilized allogeneic material.

Materials And methods

Survey, planning And treatment patients with severe bone tissue atrophy in the area of defects in the dentition of the jaws was carried out using general clinical and special methods research (cone beam computer tomography (CT), densitometry bone fabrics jaws, periotestmetry ; rheoparodontography ; quality of life studies). Surgical stage consisted V carrying out dental implantation with simultaneous digital reconstruction of the alveolar bones By author's method using individual reconstructive implants from lyophilized allogeneic material. Subsequentprosthetics on implants were performed according to traditional methodology.



Rice. 1. Original clinical situation V cavities mouth (A, B) and panoramic section segment computer tomograms jaws



Rice. 2. Slice computer tomograms jaws:

A — original situation; B — positioning implants

With taking into account anatomical and topographical features And prosthetic planes; B - positioning of implants taking into account subsequent resorption, reconstructive bone implant; G - technical specifications for manufacturing individual reconstructive bone implant

Clinical example

Patient A., 52 of the year , appealed With complaints on absence teeth, impossibility full-fledgedreception food.

Objectively: there are no teeth 2.6 in the oral cavity; 3.6, V region absent tooth 2.6 significant atrophy of the alveolar process is determined upper jaw. Alveolar bone on palpationwide, with reduced height. In the area of the missing tooth 3.6 vertical and horizontal atrophy alveolar process bottom jaws Not determined (rice. 1).

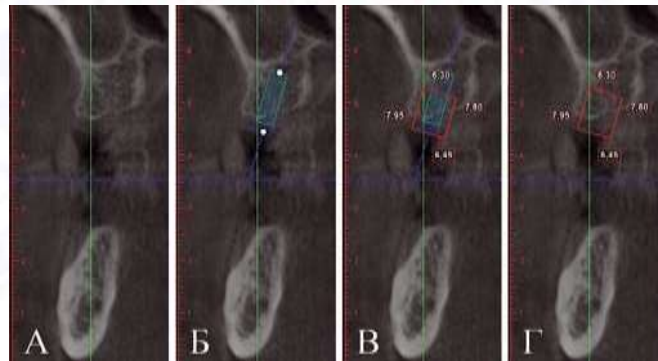
At analysis CT on top jaws identified much pronounced horizontal atrophy alveolar process left, appropriate level C (according to Misch S.E. and Judi KWM), the length of the bone defect of the alveolar process the upper jaw on the right was 12.3 mm, the width alveolar bones varied from 8.3 before 10.4 mm, and height - from 5.4 to 8.3 mm. Bone densitometry fabrics on throughout bone defect V average amounts to 618.3 ± 11.8 HU, biotype D3.

On basis clinical and radiological examination, a diagnosis of “partial absence of teeth top jaws, 3 Class By Kennedy, complicated atrophy alveolar bones; partial absence of teeth in the lower jaw, grade 3By Kennedy; a loss chewing efficiencyBy Agapov 12%; etiological factor — cariesAnd his complications”.

By computed tomogram of the jaws V software ensuring Planmeca Romexis Viewer carried out preliminary planning: 3D positioning of dental implants taking into account anatomical and topographical features and prosthetic plane, determination of deficiency parameters alveolar bones top jaws on the right, drawing up technical specifications for modeling shape and volume (taking into account subsequent resorption) and production of individual reconstructive implant from lyophilized allogeneic material. Shortage parameters alveolar bone of the upper jaw on the left in projection implant 3.6 By height — before 4.8 mm (rice. 2, 3).

Obtained digital CT data jaws at help algorithm conversion transformed V 3D digital model bone fragment jaws V format STL (rice. 4). IN result modeling reconstructive bone implant on basis individual technical tasks (rice. 5A) got his digital solid state 3D model With individual parameters. After milling processing With application manager programs For manufacturing bone blocks (rice. 5 B), developed by the authors

, from pre- lyophilized allogeneic bone biomaterial we obtained reconstructive implant With individual parameters (rice. 5B).



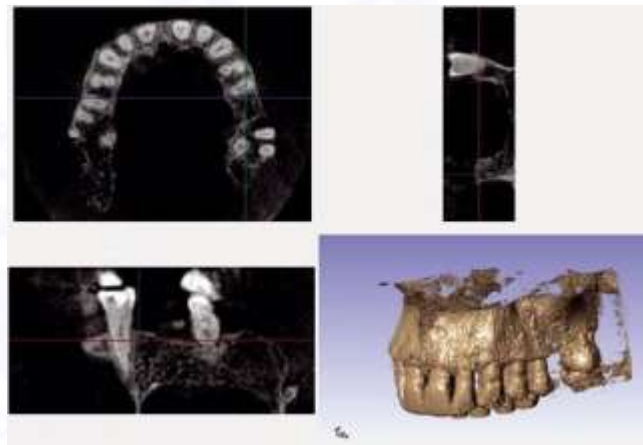
Rice. 3. Slice computer tomograms jaws V projections 2.6:

A — original situation; B — positioning implants

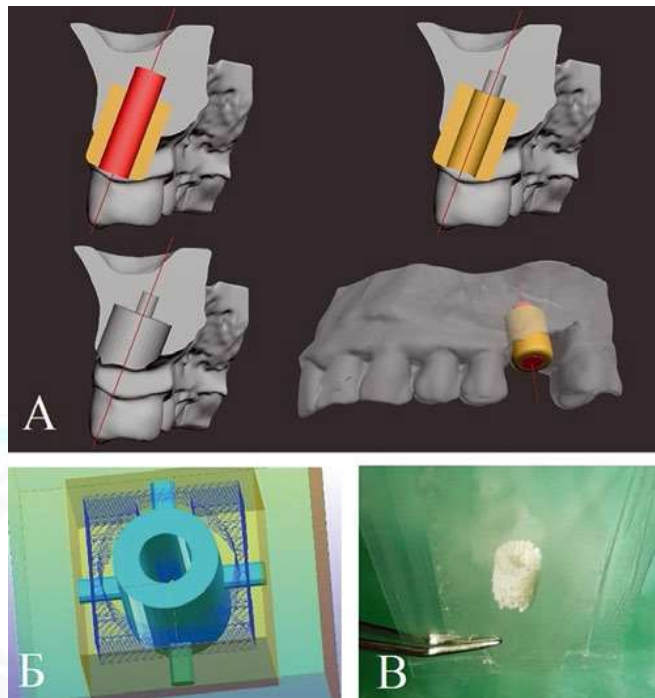
With taking into account anatomical and topographical features And prosthetic planes; B - positioning of implants taking into account subsequent resorption, reconstructive bone implant; G - technical specifications for manufacturing individual reconstructive bone implant

12 hours before surgery the patient was prescribed preventive antibacterial therapy: amoxiclav 625 mg 3 times a day. Under the infiltration anesthesia Sol . Ultracaini D.S. — 1.7 ml an incision was made in the mucous membrane, peeling And reclining mucoperiosteal _ flap.By previously prepared surgical _ implantological

template carried out pilot drilling, setting direction and depth dives bone implant. Processed sequentially using a set of cylindrical cutters of different diameters cavity in the alveolar process top jaws. Before installations reconstructive implant from lyophilized allogeneic material with individual parameters rehydrated And satiated ultrasound within one minute with a complex of antibacterial And antifungal drugs (amoxiclav ,butol , dexamethasone , amphotericin B), impregnated components of blood from the wound and added autogenous bone component into its structure (Fig. 6). Installed reconstructive bone implant V processed _ cavity alveolar process. Osteotomy bone box dental implant carried out By previously simulated And milled tubular guide for a reconstructive implant V depth alveolar process jaws on size, equal to $\frac{1}{4}$ length intraosseous parts dental



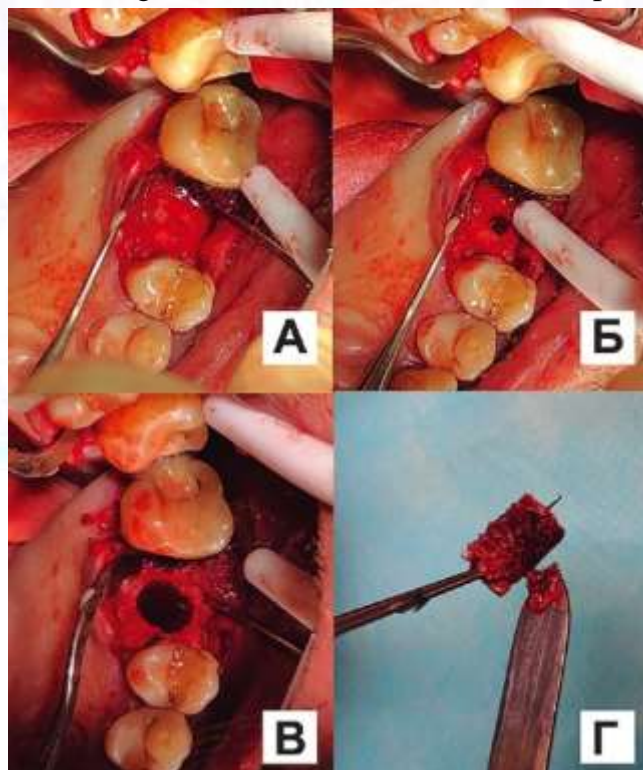
Rice. 4. Stage receiving bone implant
 With individual parameters, import digital data computer tomography jaws And receiving
 3D digital models bone fragment jaws



Rice. 5. Stages receiving bone implant With individual parameters:

A — modeling reconstructive bone implant

And guides dental implants With taking into account individual anatomical and topographical features; B - digital solid state 3D model reconstructive bone implant V space manager programs For manufacturing bone blocks; IN — reconstructive implant from lyophilized allogeneic material With individual parameters



Rice. 6. Stages operational interventions on top jaws, left:

A — peeling And reclining mucoperiosteal _ flap; B — pilot drilling, completed

according to a surgical implantological template, sets direction and depth of immersion of the bone implant; IN — cavity V alveolar process top jaws;

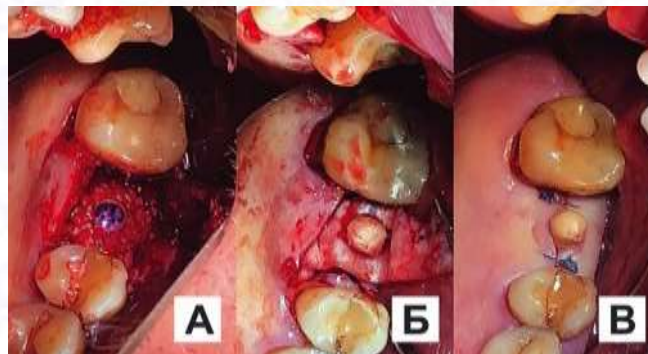
G — deposit autogenous component bones

Fig . 6. Surgery stages on the top jaw at the left:

A — flaking and an otkidyvaniye mucous periosteal a rag; B — the pilot drilling executed on a surgical implantologichesky template sets the direction and depth of immersion of a bone implant; IN — a cavity in an alveolar shoot of the top jaw;

G — introduction of an autogenic component of a bone

implant from bottom processed cylindrical cavities With taking into account individual anatomical and topographical features. Fixation reconstructive bone implant was carried out due to adhesion to the treated cavity walls and due to installed dental implant at $\frac{1}{4}$ length its intraosseous part into a pre-formed bone bed at the bottom of the treated cylindrical cavity, was installed on the intraosseous dental implant former gums. Mobilized mucoperiosteal _ flap. Surface individual reconstructive implant from lyophilized allogeneic material isolated collagen membrane from the dura mater, pre-saturated antibacterial And antifungal component (amoxiclav , butol , dexamethasone , amphotericin IN), which hemmed To periosteum resorbable thread Vicryl 5-0. They imposed



Rice. 7. Stages operational interventions on top jaws, left:

A — fixation reconstructive bone implant behind check adhesion to the treated cavity walls and installed dental implant; B — installed shaper gums on dental implant V region 2.6, surface individual reconstructive implant made of lyophilized allogeneic material isolated collagen membrane from hard cerebral shells;

IN — imposed nodal seams non-resorbable suture material

Fig. 7. Surgery Stages on the top jaw at the left:

A — fixing of a reconstructive bone implant due to adhesion to the processed walls of a cavity and the established dentalny implant

B — is established the gum shaper on a dentalny implant in area 2.6 of an individual reconstructive implant from the lyophilized allogeny material isolated by a collagenic membrane from a firm brain cover;

IN — nodal seams are imposed by nerezorbiruyemy sutural material

interrupted sutures with non-resorbable suture material Prolene 4-0 (rice. 7A — IN).

Conducted comprehensive therapy V postoperative period: general And local; anti-inflammatory And symptomatic, complications not noted. Within 2 days in the area of operational interventions observed hyperemia mucous membrane shell And insignificant exudation. Collateral edema was completely relieved on day 6, sutures were removed on 12 day.

Regional blood flow indicators after 1 month after dental implantation with one-stage bone plastic indicated on development violations local hemodynamics. ABOUT beginning development processes perestroika allogeneic bone block indicated an increase in initial indicators peripheral resistance (IPR) up to 126.1%, regional vascular tone (PVT) - up to 26.4% with simultaneous decrease in blood flow intensity (RI) before 0.04 Ohm And elasticity vascular walls (IE) before 48.5%. Through 8 months at analysis repeated com computer tomograms jaws on panoramic slice visualized newly formed bone textile. At comparison slices CT original And after operational _ interventions marked growth parameters alveolar _ bones V projections 2.6 (By width — before 7.8 mm, By height — from 3.2 before 6.3 mm). Density bone fabrics the lower jaw in the reconstruction area has increased And amounted to V average 724.2 ± 9.6 HU, What corresponds biotype D3B region carried out bone reconstruction analysis regional blood flow peri-implant fabrics through 8 months showed decline tone blood vessels and decreased peripheral resistance (predominance vasodilator reactions), on What indicated decline indexes IPS (70.6%) And PTS (before 29.6%), increased IE (before 80.9%) and intensity of regional blood supply to the RI (0.052 Om).

Periotestometry before the orthopedic stage of treatment showed that the degree of stability of the dental implant in the projection was 2.6 - 2.52 USD e. After 9 months, orthopedic surgery was performed treatment metal-ceramic crown With support on dental implant 2.6.

results surveys OHIP-14 on next day (24 points) and a week (16 points) after fixation fixed orthopedic designs With support on dental implants showed good level of patient's quality of life. Conducted treatment patient fully satisfied.

conclusions

The use of individual reconstructive implants from lyophilized allogeneic _ material at expressed atrophy bone fabrics jaws allows much expand readings To dental implantation And reduce the total duration of treatment is on average 6 months due to the simultaneous implementation of augmentation and implantation. Data from special methods research confirm What again the formed bone tissue is fully functional

for adoption occlusal loads on dental implant Implementation reconstructive implant made of lyophilized allogeneic material leads To increase area contact reconstructive implant With autogenous bone alveolar tissue, increasing its revascularization and osteoconductive potential, reducing the likelihood of its rejection and complications in the postoperative period, expanding the indications for dental implantation

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