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"THE ROLE OF SOFT TISSUES IN THE FORMATION OF FUNCTIONAL AESTHETICS AROUND SOLID (ONE-PIECE) AND COLLAPSIBLE (TWO-PIECES) DENTAL IMPLANTS INSTALLED ACCORDING TO A ONE-STEP PROTOCOL. COMPARATIVE ANALYSIS"

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Abstract:

Aesthetic and functional analysis of the clinical results of implantological treatment with the use of solid (one-piece) and collapsible (two-pieces) implants. The key role of the temporary restoration and the connective tissue graft in the formation of the natural teething profile and the attached keratinized mucous membrane was revealed. It is established that the achievement of optimal results increases with the presence of a thick biotype of the gums. The article reveals the advantages of transgingival healing, in particular: reducing the number of surgical steps, the absence of additional trauma, the formation of teething profile during the healing time, etc. It is important to make a correct temporary construction, and the immediate installation of the prosthetic should be installed in the first 48 hours after implantation without static and dynamic occlusal contacts. For an optimal teething profile of the crown on the implant and visual harmony with the rest of the dentition the final prints must be done no earlier than 3 months after implantation. The purpose of the study is a comparative aesthetic and functional analysis of the clinical results of implant treatment with the use of one-piece and two-pieces implants.

Keywords: *single-stage dental implantation, one-piece (solid) implant, two-pieces (collapsible) implant, free autologous connective tissue graft, trans - epithelial healing, teething profile, temporary crown on the implant.*

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INTRODUCTION:

The terms of effective use of dental implants largely depend on the biological processes of interaction between the implant and its surrounding tissues, including the functional state and reactive properties of soft tissues in the area of implantation.

Clinical and experimental studies of periodontal and regional hemodynamics indicate the key role of microcirculation in the formation and management of adaptive - compensatory processes.

Currently, the survival and long-term functioning of implants are no longer considered the only important criterion for the success of treatment. Long-term stability and aesthetic parameters of soft tissues around dental implants are of great importance.

Most of the work in the field of dental implantology associated with the improvement of the connection of the implant with the bone tissue, which are aimed at achieving reliable fixation. However, the process of osseointegration, which ensures the strength of the attachment of the supporting bone structures to the surface of the dental implant, is determined by the resistance to bacterial attacks of the formed soft tissue barrier.

Today proved that the rate of implant survival does not depend on the quantity and quality of peri-implant soft tissue, but the effect on the maintenance of their aesthetic and health. The question remains about the method of plastics of soft tissues around the implants.

Particular attention should be paid to the mucosal biotype, the most prominent clinical signs of which are the thickness and scalloped contour. Achieving optimum results dental implantation increases in the presence of a thick biotype, usually associated with low and wide papilla as well as a sufficient number of attached mucosa. The risk of complications increases with a thin biotype, and then there is a need to increase its thickness.

Previously it was thought that the results of soft tissue volume around the teeth can not be extrapolated to the implants, and the value of the zone of attached gingiva was the subject of much debate. There is no consensus in the literature about the criteria for the separation of gums into biotypes, only clinical parameters are noted. It also remains an open question about the techniques of soft tissue plastics around implants.

To eliminate recessions on the teeth began to use sub-epithelial grafts that contain information predetermines the nature of keratinized covering epithelium.

The use of free gum transplants has been described by Bjorn (1963), Sallivan and Atkins (1968). Basically, they were used in the plastic surgical periodontology to create keratinized attached gingiva area and for oral vestibular deepening.
Currently there are a number of techniques designed to restore the volume of the soft tissue around the implant, which include vascularized and non - vascularized grafts. As a rule, this kind of manipulation is carried out at the stage of disclosure of the implant and the installation of the gum former.

For many years the classic Bronemark protocol is considered the gold standard and most dentisis follow a rule of 8 weeks in the mandible and 12 weeks in the maxilla with the full suturing soft tissue over the implant, re-cut and install gum shaper on the 14^{th} day.

Currently, there are tendencies to move away from the standard protocol towards trans-epithelial healing and combining all surgical procedures in one step, setting a temporary crown (one-piece implant) or abutment (collapsible implant) and temporary crown immediately at the moment of implantation.

Research Small and Tarnow, (2000), showed that for an optimal teething profile of the crown on the implant and visual harmony with the rest of the dentition the final prints must be done no earlier than 3 months after implantation.

MATERIALS AND METHODS:

During the period from 2016 to 2018, we were treated 46 patients aged 30 to 55 years old with a thin biotype, intact periodontal without severe concomitant diseases and bad habits, with the end incorporated defects in the anterior and posterior teeth. Patients were selected by simple randomization according to the inclusion and exclusion criteria. Three patients for several reasons (personal circumstances, refusal of treatment) were withdrawn from the study. The loss of one implant in the chewing section of the lower jaw at the stage of osseointegration was recorded. Each patient underwent clinical and X-ray examination, was diagnosed - "Partialedentulous", after which the indications for dental implantation are defined.

The operation of dental implantation was carried out

according to the same method, under the control of local infiltration anesthesia. Solid Q- implant titanium implants and two-parts QZAs from the Trinon company were used. 19 patients were operated on by one-step implantation (solid implants «Q- implant») using free connective tissue grafts, temporary crowns, permanent prosthesis, followed 3 months after surgery.

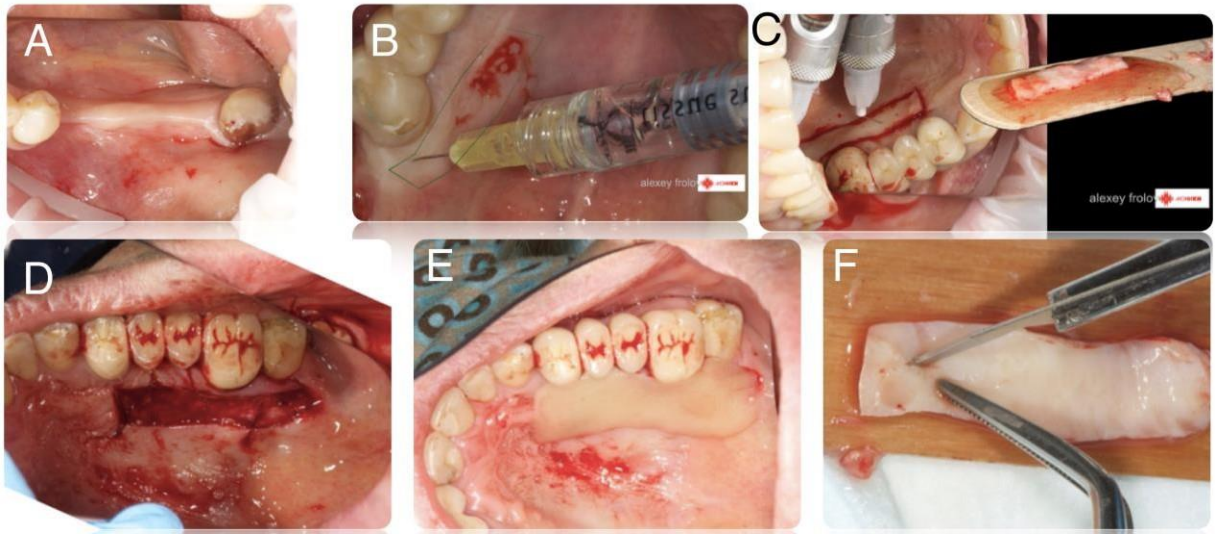
17 patients underwent a one-step implantation (two-parts " QZA") using free connective tissue grafts, installing a mucosal or temporary crown former, followed by permanent prosthetics.

Clinical example 1 (solid implants).
Patient T. women, 1954, complained of difficulty in chewing, due to lack of the teeth in the lower jaw.
Anamnesis: the teeth were removed about 8 years ago. On examination, the absence of teeth 3.5, 3.6, 3.7 was revealed. (Pic. 01, 02). Diagnosis: absence of teeth 3.5, 3.6, 3.7. The bite orthognathic.

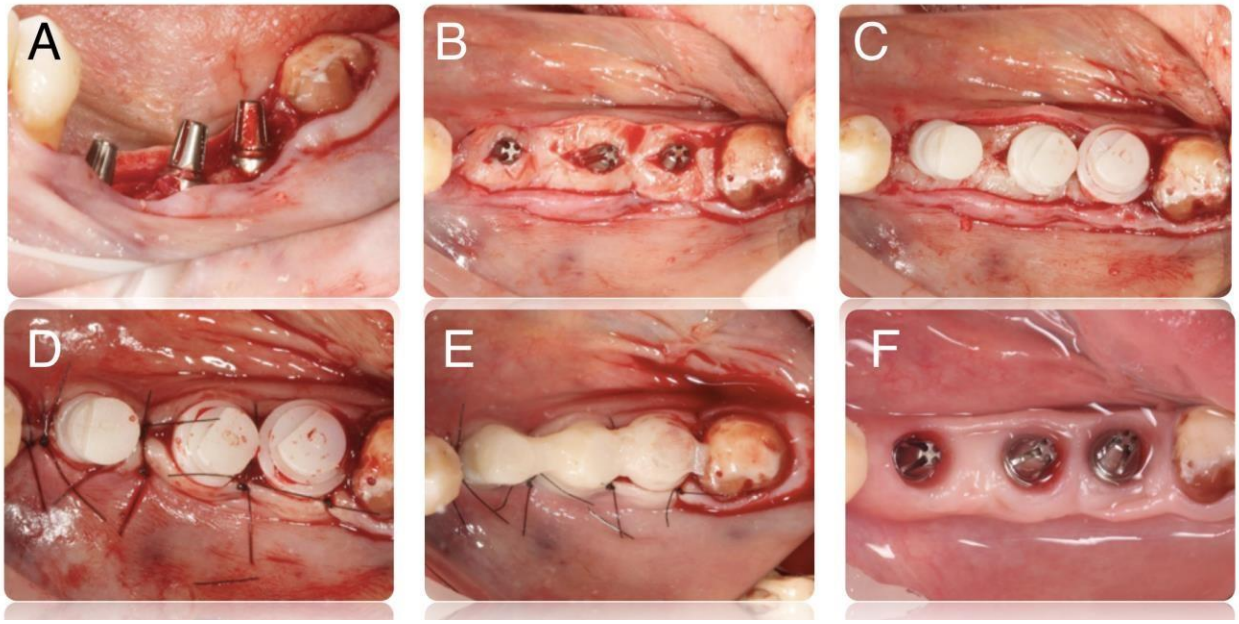
Treatment: a one-stage˘dental operation˘implantation with simultaneous recovery of soft tissue volume of free connective tissue graft in the position of the teeth 3.5, 3.6, 3.7.

The graft adapts to the necks of the implants and the periosteum, pressed against the standard temporary shaper of the gums. The edges of the split flap are laid over the graft and sutured around the temporary gum former without tension by a nylon thread 6.0.

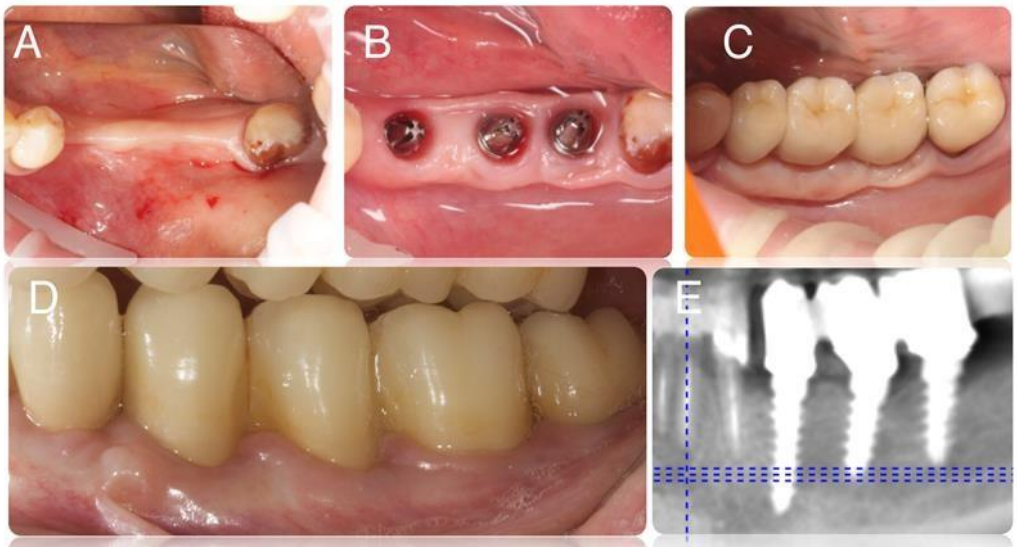
For the period of osseointegration, implants are split between themselves by means of a flowable composite material. The duration of the operation was 35 minutes. The stitches are removed for 7-10 days. The temporary orthopedic construction changes to a permanent one in 2-3 months. (Pic. 1; 2; 3).



Pic. 1. A - the situation before treatment ; B , C , D - graft collection ; E - protection of the donor area ; F - de - epithelization and perforation of the flap.



Pic. 2.A - implant placement ; B - graft adaptation ; C - installation of acrylic soft tissue formers ; D - suturing ; E - splinting ; F - view after 60 days.

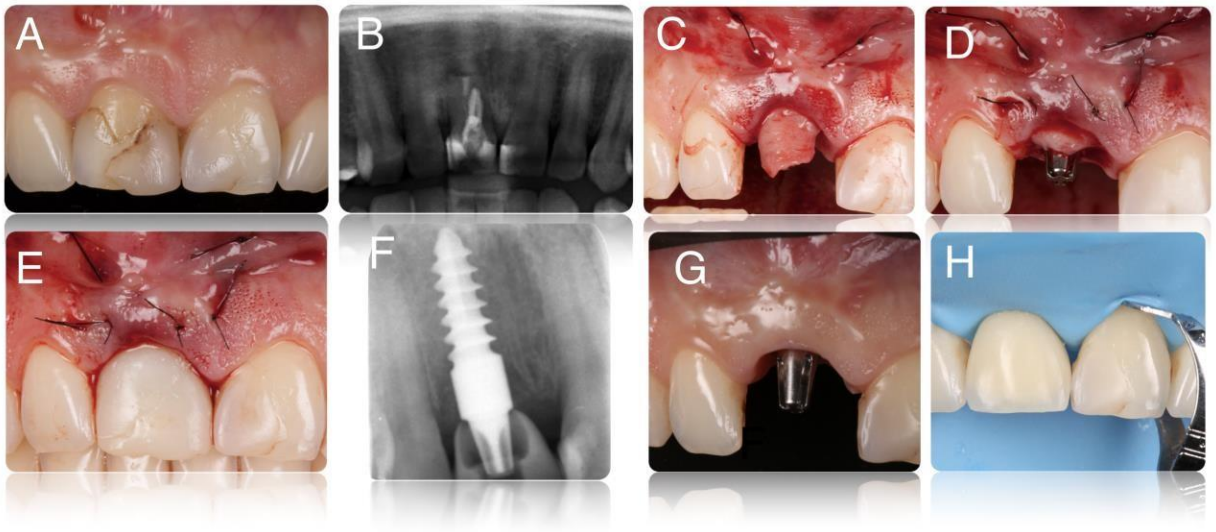


Pic. 3 A, B - type of mucous before and after treatment; C, D - a type of a constant construction ; E - X –ray control.
Clinical example (2 solid implants).
Patient women, 1962, complained of pain in the tooth 1.1.
Anamnesis: prosthetics of the tooth 1.1 by tab and metal-ceramic crown 3 years ago. Diagnosis: root fracture of tooth 11. Bite orthognathic.

Treatment: a one-stage dental operation implantation with simultaneous recovery of soft tissue volume of free connective tissue graft in the position of the tooth 1.1.

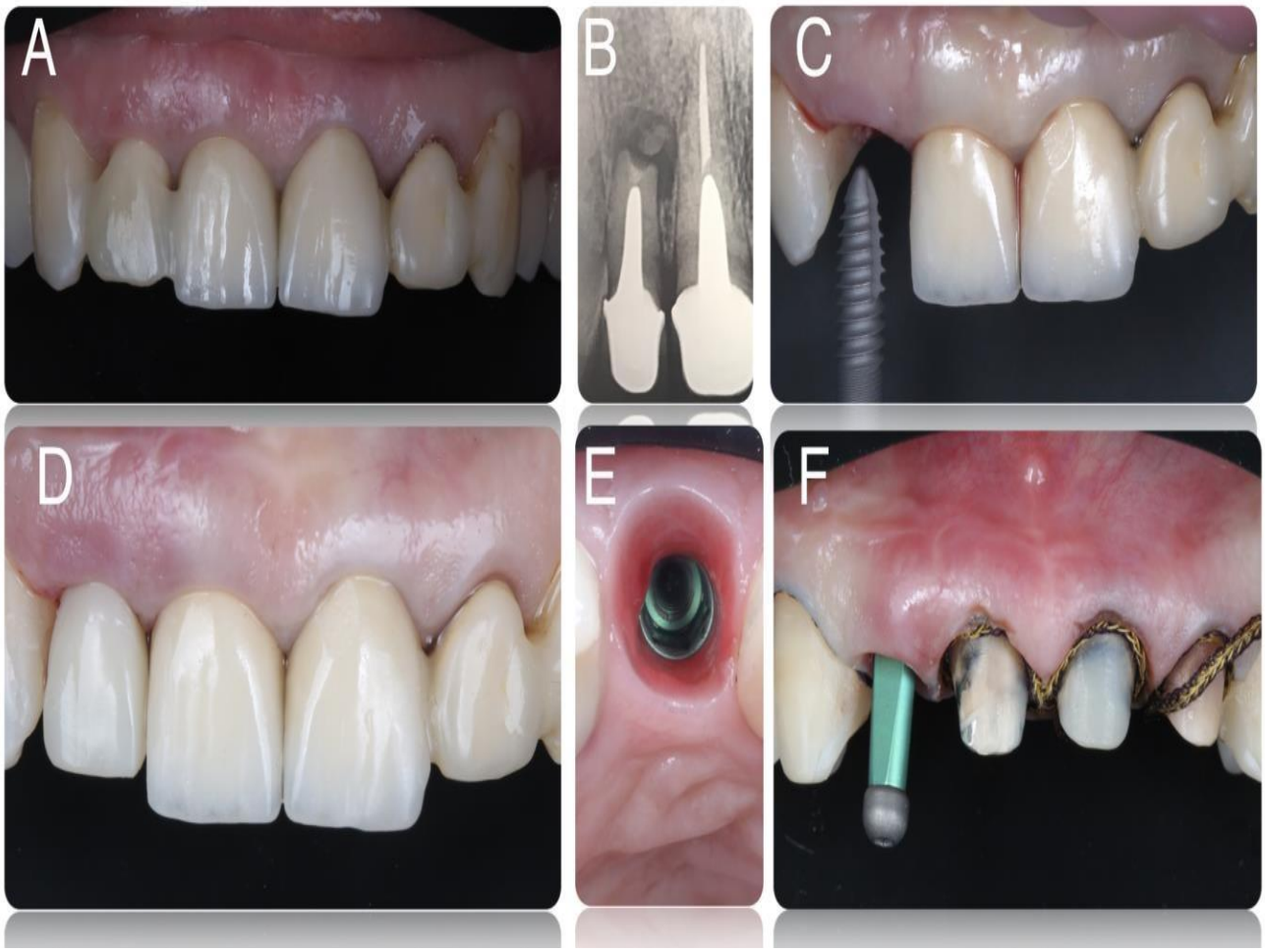
The graft is adapted to the neck of the implant due to a temporary crown made intraoperatively. The duration of the operation was 45 minutes.

The stitches are removed for 7-10 days. The temporary orthopedic design changes to constant 2-3 months after. (Pic. 4; 5).



Pic.4. AB - view before treatment; C - soft tissue graft replanting; D - implant installation; E - setting a temporary crown; F - X - ray control; G - view after 2 months; H - fixation of restorations.

Pic. 5. View before and after treatment. X-ray control. Clinical example 3. (two-parts implants)
Patient T., women, 1974, complained of pain in the tooth 1 February.
Anamnesis: prosthetic teeth 1.2; 1.1; 2.1; 2.2 tabs and metal ceramic crowns 15 years ago. Diagnosis: tooth 12 chronic periodontitis in exacerbation. Orthognathic bite.
Treatment: a one-stage dental implantation was performed with a one-time restoration with a temporary crown at a temporary abutment in position of the tooth 1.2.
The duration of the operation was 45 minutes.
The stitches are removed for 7-10 days. The temporary prosthetics changes to a permanent one in 2-3 months. (Pic. 6; 7).



Pic. 6. A , B - view before treatment; C - implant installation; D - installation of a temporary crown; E -view of the mucous before taking impressions; F - taking prints with a closed spoon.

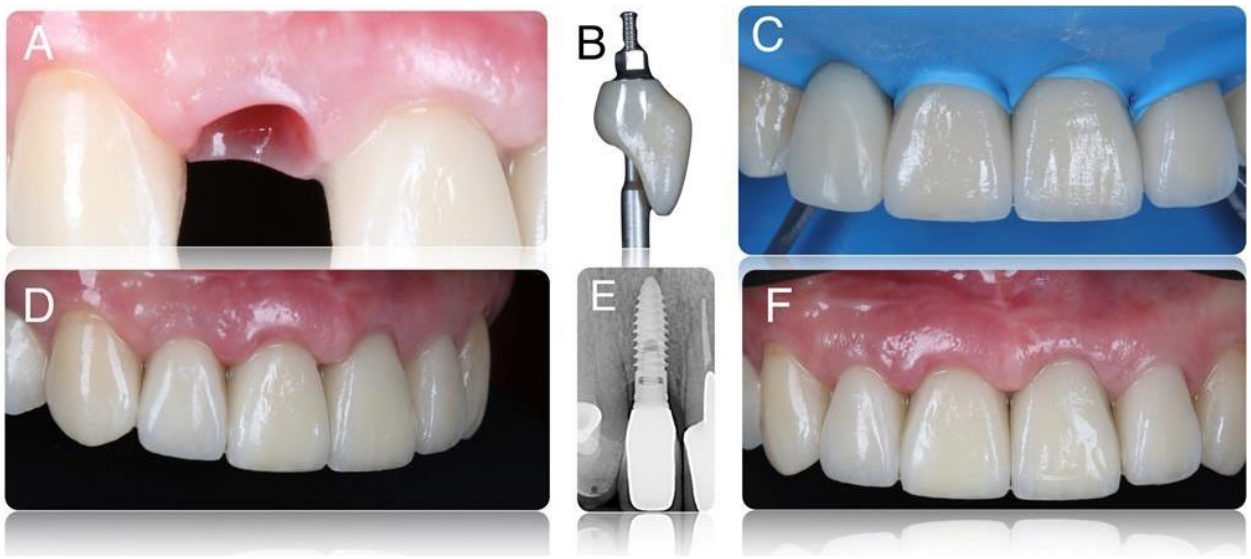
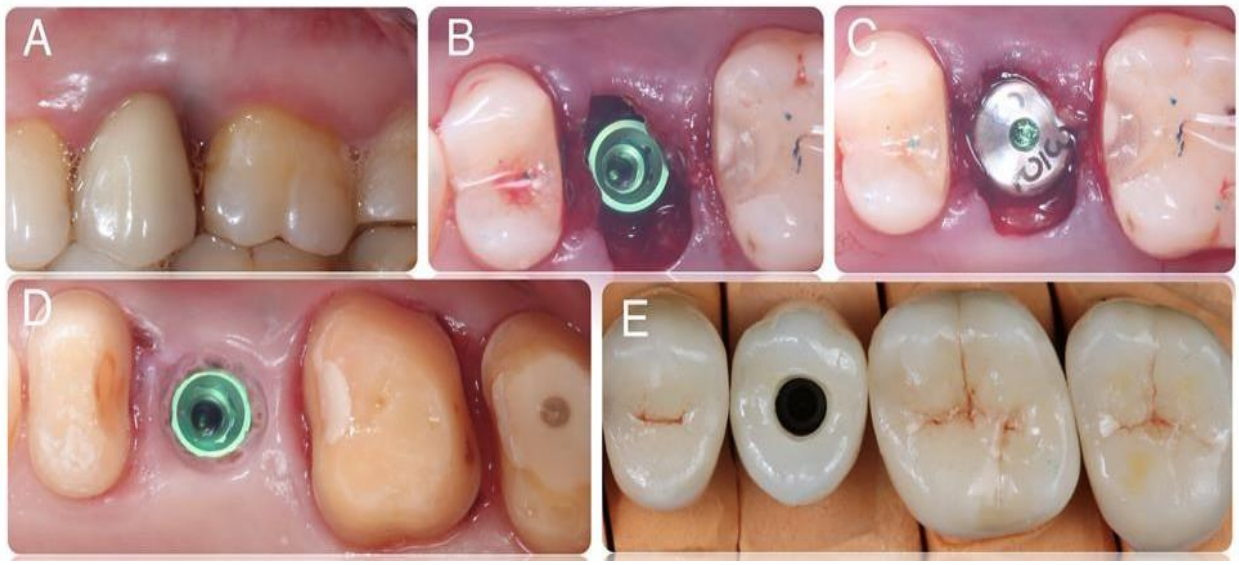
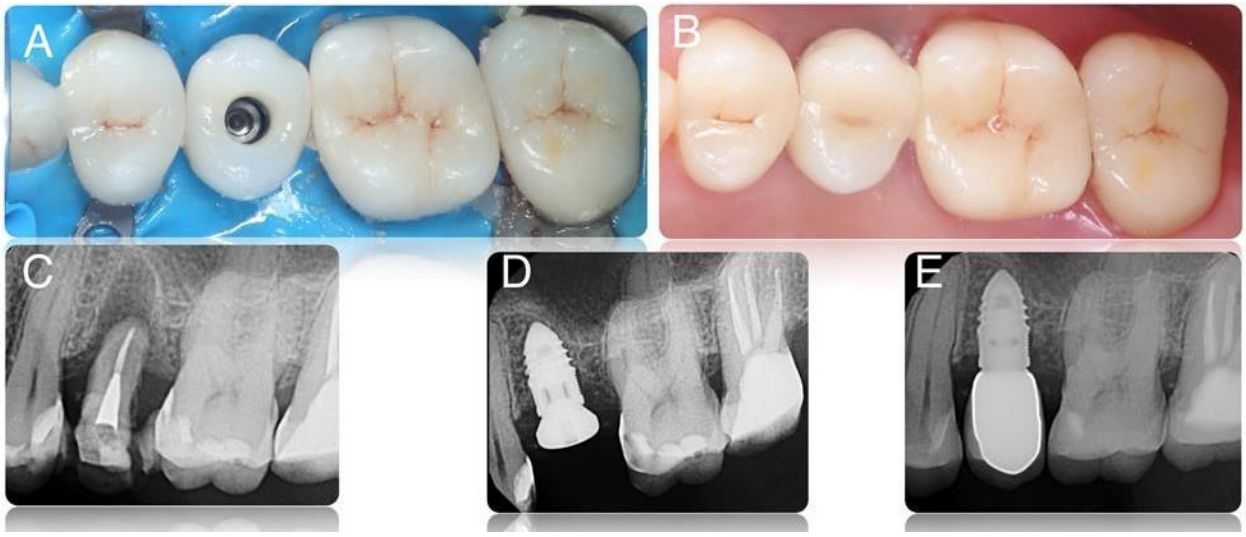


Fig . 7 A - view of the mucous before fixing the permanent crown on the implant ; B - crown profile ; C - fixation of restorations ; D , E , F - one week after fixation . X-ray control.

Clinical example 4. (two-pieces implants)
Patient I., man, 19 year of birth, complained of pain in the area of the tooth 1.5. Difficult chewing.
Anamnesis: restoration dental fillings 1.4; 1.5; 1.6; 1.7 - 11 years ago. Diagnosis: tooth 15 chronic periodontitis in exacerbation. Tooth 1.4; 1.6 deep caries. Tooth 1.7 chronic pulpitis in aggravation. Bite straight.
Treatment: a single-stage dental implantation with one -moment restoration of the volume of attached keratinized mucosa along the perimeter of the implant. Installed soft tissue shaper. Dental treatment 1.4; 1.6; 1.7.
Permanent crowns are installed 3 months after implantation. (Pic. 8; 9).



Pic.8. A - view before treatment; B, C - implant , gingiva shaper. The connective tissue graft is planted; D - view of the mucous before fixation of prosthetic part; E - ceramic crown on the model.



Pic. 9. A, B - fixing ceramic restorations; CDE - X - ray control at the stages of treatment.

RESULTS AND DISCUSSIONS:

The long-term results of treatment with one-piece and two-pieces implants showed no clinically and statistically significant differences. In two groups, good aesthetic parameters, high degree of abilities and acceptable X-ray picture were observed.

Benefits of trans-gingival healing include: reduction of the number of surgical stages; no additional injury of soft tissues; reduction of anesthesia; formation of teething profile of the crown at the stage of healing; functional and non-functional load; reducing the risk of seam differences and diastasis of the wound edges; the possibility of bilateral splinting of implants during the surgical stage, which increases their stability and resistance to stress.

It is difficult to overestimate the role of cosmetic patient support during the rehabilitation period.
There is no doubt that the benefits of trans-epithelial healing, particularly with increased mucosa volume provide temporary prosthetics made correctly. It is considered that the immediate placement of provisional prosthesis without the static and dynamic occlusal contacts must be carried out in the first 48 hours after implantation.

The correct location of the approximal contact points and the concave vestibular teething profile of the crown provides mechanical support and the volume of the vestibular contour of the mucous membrane and papilla.

CONCLUSION:

When planning rehabilitation treatment of patients with dentition defects using dental implants, an integrated approach is needed. In addition to traditional clinical and radiological studies, it is important to determine the biotype of the gum in a patient in order to identify risk factors for the development of recessions in the postoperative period. An important component is a temporary prosthetics. Temporary prosthetics on implants at the time of surgery: barrier function, preventing bacterial invasion, and provides sealing wounds in the neck of the implant; support for the interal papillae and vestibular contour of the gum; protect the peri-implant tissue from injury by a food lump; ensured by the earlier non-functional loading; allow the patient to remain socially active throughout the entire period of rehabilitation, especially in an aesthetically significant area.

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