

ЎЗБЕК ТИББИЁТ ЖУРНАЛИ УЗБЕКСКИЙ МЕДИЦИНСКИЙ ЖУРНАЛ UZBEK MEDICAL JOURNAL

Zukhra Abduboriyevna Jilonova,

Azim Bakhromovich Olimov,

Zafar Ziyodullayevich Nazarov,


Javlon Jamoliddinovich Mannanov.

Department of Surgical Dentistry and Dental Implantology,

Tashkent State Dental Institute, Uzbekistan

E-mail: ooazik@mail.ru

THE MAIN RULES AND PRINCIPLES OF INTRAOPERATIVE DIRECT PROSTHETICS, THE KEY TO SUCCESS IN IMMEDIATE IMPLANTATION

 <http://dx.doi.org/10.26739/2181-0664-2020-SI-2-12>

ABSTRACT

According to the Protocol of intraoperative direct prosthetics (IDP), the immediate functional load is provided by temporary orthopedic structures. The Protocol significantly reduces the treatment time and the need for preliminary pre-prosthetic reconstructive surgery-bone transplantation methods and allows you to bypass areas where transplants are ineffective. The orthopedic Protocol is simplified as much as possible. The possibility of prosthetics without the use of cement fixation of prostheses is realized. Protocols of intraoperative direct prosthetics for implant-prosthetic rehabilitation of patients require prototyping and designing of treatment results.

Keywords: implant-abutment, implant-prosthetic, one-stage implantation, immediate intraoperative prosthetics, reconstructive surgery, direct implantation, screw shafts.

Зухра Абдубориевна Жилонова,

Азимжон Бахромович Олимов,

Зафар Зиёдуллаевич Назаров,

Жавлон Жамолитдинович Маннанов.

Кафедра хирургической стоматологии и стоматологической имплантологии,

Ташкентский Государственный Стоматологический Институт, Узбекистан

Эл.почта: ooazik@mail.ru

ОСНОВНЫЕ ПРАВИЛА И ПРИНЦИПЫ ИНТРАОПЕРАЦИОННОГО ПРЯМОГО ПРОТЕЗИРОВАНИЯ, УСПЕХ ПРИ НЕМЕДЛЕННОЙ ИМПЛАНТАЦИИ

АННОТАЦИЯ

Согласно протоколу интраоперационного прямого протезирования (ВПР), непосредственная функциональная нагрузка обеспечивается временными ортопедическими конструкциями. Протокол значительно сокращает сроки лечения и необходимость предварительных методов предпротезной реконструктивной хирургии — костной трансплантации, а также позволяет обходить участки, где трансплантаты неэффективны.

Ортопедический протокол максимально упрощен. Реализована возможность протезирования без применения цементной фиксации протезов. Протоколы интраоперационного прямого протезирования для имплантационно-протезной реабилитации пациентов требуют прототипирования и проектирования результатов лечения.

Ключевые слова: имплантат - абатмент, имплантат - протез, одномоментная имплантация, интраоперационное немедленное протезирование, реконструктивная хирургия, прямая имплантация, винтовые валы.

Зухра Абдубориевна Жилонова,
Азимжон Бахромович Олимов,
Зафар Зиёдуллаевич Назаров,
Жавлон Жамолитдинович Маннанов.

Жаррохлик стоматология ва дентал имплантология кафедраси,
Тошкент Давлат Стоматология Институту, Ўзбекистон
Эл.манзил: ooazik@mail.ru

ДЕНТАЛ ИМПЛАНТАЦИЯДА ТЎҒРИДАН-ТЎҒРИ БЕВОСИТА ПРОТЕЗЛАШНИНГ АСОСИЙ ҚОИДАЛАРИ ВА ТАМОЙИЛЛАРИ, БЕВОСИТА ИМПЛАНТАТСИЯДА МУВАФФАҚИЯТ КАЛИТИ

АННОТАЦИЯ

Дентал имплантацияда интраоперацион бевосита протезлаш протоколига асосан (впр) бевосита функционал босим вақтинчалик қопламалар ёрдамида амалга оширилади. Бу усул даволаш муддатини кескин қисқартиради ва реконструктив хирургия, яъни суяк пластикаси каби операцияларни олдини олишни имконини беради. Ортопедик босқич максимал даражада енгиллаштирилган. Цементли фиксациясиз тишларни протезлаш имконияти пайдо бўлди. Беморларни имплантатлар билан протезлашда интраоперацион бевосита протезлаш усули даволаш усуллари даволаш натижаларини прототиплаш ва лойихалашни талаб қилади.

Калит сўзлар: имплантат - абатмент, имплантат - протез, бир вақтни ўзида имплантация, интраоперацион бевосита протезлаш, тикловчи хирургия, бевосита имплантация, винтли валик.

Relevance. The basics of direct implantation as an independent Protocol were first developed and successfully applied by P.I.Branemark several decades ago (1989). The clinical and scientific interdisciplinary direction "intraoperative direct prosthetics based on implants" (IDP) has been developing for more than 30 years in 40 countries worldwide. This Protocol is actively used by volunteer doctors from different countries in Germany, China, the USA, South Korea, Israeli and other countries as a social program to help vulnerable segments of the population. Significant clinical experience has been accumulated and a large number of scientific publications based on the principles of evidence-based medicine have been published, including by Russian doctors [2, 3, 4, 8]. Methods of pre-prosthetic reconstructive surgery are used To solve these tasks (preprosthetic reconstructive surgery) [1, 4]. Most specialists, unfortunately, consider IDP as a forced measure and use these protocols exclusively in aesthetically significant areas, usually based on 1-2 implants. Prosthetics are often performed at the implant level. Many factors: social, psychological, material and, first of all, temporary and modern requirements for the quality of life of patients, motivate specialists to optimize protocols, primarily in time, and, of course, in the quality of life of the patient. The implantation Protocol with immediate intraoperative prosthetics in missing and removed teeth reduces the treatment time until the end of the surgical procedure and is most popular among patients. Patients start using prostheses immediately after the implantation operation. Methods, standards, and clinical protocols have been developed [6]. This article offers the author's Protocol for IDP planning and rehabilitation of patients.

Purpose of Research. This study aims to optimize the planning Protocol and standardize the protocols of intraoperative direct prosthetics.

Materials and methods. A clinical examination and treatment of 45 people were performed using IDP protocols developed as standard in the clinic. The materials of this study are a comparative analysis of IDP methods, development of methods and criteria for evaluating protocols, from the perspective of predicting the result obtained — full functional rehabilitation of patients. State of the question: in our study, we consider the methods and technologies of pre-prosthetic reconstructive surgery that are most widely and often found in dental practice for immediate implantation and include:

- Surgery to remove the tooth, cystectomy and immediate implantation in the hole;
- Installation of implants with simultaneous bone grafting;
- Operations on soft tissues that are applied simultaneously during implantation and bone grafting;
- Intraoperative direct prosthetics based on installed implants.

Difficulties in performing such operations, on the one hand, are associated with bone atrophy and chronic inflammatory processes, including in the periapical zone of the teeth to be removed, as well as in various forms of periodontitis — and this is most significant; on the other hand, there are organizational difficulties, "bind" schedule podiatrist to a schedule of the surgeon, the allocation for immediate prosthetic rehabilitation (orthopaedic materials and tools) on the territory of the operating unit or Vice versa, making room for surgery, often with the assistance of anesthesiology service near orthopaedic admission.

Treatment is carried out both under local anesthesia and under combined anesthesia — balanced sedation and local anesthesia. Indications for sedation are marked dentophobia of the patient, somatic pathology at the stage of compensation and decompensation, and the intervention's volume and duration (additional, comprehensive training of patients was carried out). The basis for deciding on sedation is the safety of the treatment and the possibility of speeding up surgical protocols [8]. It should also be noted that when performing surgical interventions lasting more than an hour and a half without an anesthetic allowance, patients experience discomfort, get tired, which makes it difficult or impossible to continue simultaneous temporary prosthetics.

The term "direct implantation" refers to implants' placement in the hole of the removed tooth or the simultaneous installation of implants during bone grafting operations. The position of the implant and its angle of inclination determined by the availability of bone volume, providing installation and primary stability of the implant, if possible, to bypass the anatomical structures, the maxillary sinus or the mandibular canal, eliminating the need to perform traditional procedures, sinus lifting, transplantation of bone blocks and lateralization n.mandibularis [9, 11].

The main direction of IDP is the installation of implants with an orthopedic platform of conical screw abutments (uni-abutment, multi-unit, compact conical abutment, direct abutment, etc.) for transocclusal fixation to two or more implants and a temporary abutment with an antirotational element, as well as transocclusal fixation on single-installed implants with minimization of augmentation procedures. The clinical experience accumulated over the past years has shown that implants with an orthopedic interface "external and internal hexagon", "cone" provide successful osseointegration with immediate prosthetics, even on a small bone bed. The beginning of bone remodeling around implants begins directly with the process of osseointegration. These techniques allow achieving full primary stability of the implant from 25 to 55 N/cm², which allows simultaneous direct functional loading with temporary prosthetic suprastructures in the oral cavity. At the same time, the immediate functional load is provided by temporary orthopedic structures as much as possible [10]. It is possible to install pre — prepared orthopedic structures in the oral cavity or operating wound-intraoperative immediate prosthetics. If the orthopedic structure is fixed in the early postoperative period for up to 72 hours after the operation, we are talking about intraoperative direct prosthetics. However, this is a conditional classification. Let's look at the three main IP protocols.

The first Protocol is clinical: intraoperative direct prosthetics (linked to the surgical Protocol and the level of complexity of the intervention) in the clinic involves the manufacture of a

temporary bridge immediately after the implants are installed. Conical abutments with an orthopedic platform 200 are fixed directly in the wound to the implants. When choosing the abutment height, its base level (orthopedic platform) should not be more than 1-1.5 mm below the level of soft tissues in an aesthetically significant area. In the side sections, it is allowed to position the base of the abutment at the gum level. Postoperative tissue edema and subsequent recession of the oral mucosa in the implant placement area should also be considered. Titanium or plastic cylinders are fixed to the helical conical abutments with a screw. The Muco-periosteal flaps are mobilized and sutured around the cylinders. The surgical wound is covered with a cofferdam to isolate it from the orthopedic materials used in the future. Next, either the adaptation of the previously made bridge prosthesis following the occlusion is carried out, or the production of such an extempora prosthesis is carried out using a pre — made impression Kappa in a vacuum former based on the results of planning. The cylinders are fixed to the prosthesis with composite, acrylates, etc. The transocclusal screws are unscrewed, and the prosthesis is removed from the oral cavity for correction, processing, and polishing. The prosthesis is checked for the possibility of performing hygiene procedures around the implants, after which the prosthesis is fixed to the implants in the oral cavity. The screw shafts are closed with a temporary sealing material for the possible quick and safe dismantling of the entire structure [5, 6, 7].

The second Protocol is hybrid (combined): intraoperative direct prosthetics (linked to the surgical Protocol and the level of complexity of the intervention) in the clinic. The dental technician processes and corrects the design of the prosthesis (combined-hybrid).

The third Protocol is the international standard for the manufacture of temporary screw prostheses: intraoperative direct prosthetics (48-72 hours, casts, occlusion, aesthetic and functional intraoral correction "three in one"). This method involves the intraoperative installation of impression transfers and obtaining impressions using a closed or open spoon, determining the Central occlusion, installing healing caps on conical abutments or gum shapers using temporary abutments. In the laboratory, a dental technician makes or adapts previously made bridge structures to titanium cylinders using the above method. On the next day, the prosthesis is fixed with screws in the oral cavity.

Clinical example: patient K., 60 years old, went to the clinic with complaints of partial absence of teeth in the chewing area from all sides, erasability of the remaining teeth, unsatisfactory chewing function and aesthetics (Fig. 1).



Fig. 1. The condition of the oral cavity before treatment.

After receiving the patient's consent for treatment in the articulator, the occlusal plane was corrected on the models. The patient underwent diagnostic design and prototyping of the future structure. Next, an operating reference template and an impression bite module were made from transparent plastic empty-prosthesis [11].

During the operation, all the upper jaw teeth were removed: 14, 13, 21, 22, 23, 24, two Osstem TRANS-scall implants were installed in the area of 15 and 25 teeth. Further, 6 Osstem MS SA implants with a diameter of 4.5 mm and a length of 11,5 mm were installed in the frontal area in the holes of the removed teeth. All implants have primary stability of more than 40 N/cm², except one with the stability of about 20 N/cm². Conical screw direct abutments with a force of 25 N/cm²

are installed in the implants, and multi-unit abutments with an angle of 40° are installed in the area of TRANS-scall implants (Fig. 2).



Fig. 2. Screenshot CBCT after installation of screw implants and conical abutments.

Further, protective caps were fixed to the screw abutments with screws, simultaneously serving as impression modules for a closed spoon. The slit-like spaces near the implants placed in the holes of the removed teeth and areas of bone usures are filled with AutoFill. After correction and mobilization, the Muco-periosteal flaps are placed around the abutments with protective caps attached with screws and sutured. Casts were taken with A-silicone, with simultaneous fixation of the Central occlusion with the empty-prosthesis occlusion-bite module. In the laboratory, the frame of the future prosthesis was made by casting, which was glued into the oral cavity on titanium cylinders with a composite (Fig. 3), tested and adapted to the model in the dental laboratory (Fig. 4).



Fig. 3. the stage of pasting the frame into the oral cavity creates a passive fit of the prosthesis structure.



Fig. 4. stage of adaptation of the frame on the dental model with correction of analogs' position (if necessary).

Next, a temporary screw prosthesis of GDP was made — in the amount of 14 units using composite teeth and acrylic lining (Fig. 5). The prosthesis is fixed with screws in the oral cavity (Fig. 6).



Fig. 5. The appearance of the manufactured prostheses.



Fig. 6. The prosthesis is fixed in the oral cavity with screws

Shafts for screws in plastic cylinders are insulated with silicone. The patient is satisfied with the prosthesis but noted that he wants to reduce the upper lip volume due to a permanent prosthesis in the future. With the elimination of additional augmentation procedures, the injury rate of surgical interventions has decreased, the treatment time has decreased, providing more comfortable conditions for the patient. Methods of intraoperative prosthetics significantly expand patients' possibilities of direct rehabilitation during implantation, including during tooth extraction.

Results and discussion. A total of 122 implants were installed in a group of 45 patients over two years. All patients underwent immediate intraoperative prosthetics based on implants. 30 of the patients underwent immediate intraoperative prosthesis according to Protocol H3, 10 — in hybrid and 5 — clinical. No implants were lost in the first 14 days. For a total of one year, fibroosteointegration occurred in the area of 9 installed implants. Successful replantation was performed in 6 cases. This publication does not discuss cement fixation and temporary crown prosthetics on a single implant since these methods are widely described in the literature and, in our opinion, are not difficult to study.

Direct implantation includes such concepts as intraoperative direct prosthetics, intraoperative positioning of the implant-abutment interface axis. These terms are used both in the Russian Federation and abroad but are not well known to many dentists and maxillofacial surgeons. The article presents standard protocols for immediate implantation and intraoperative prosthesis as an alternative for augmentation and guided bone regeneration to extract teeth and atrophy of alveolar processes.

Helical conical abutments with an angle of inclination of the orthopedic platform make it possible to install implants in various anatomical conditions, avoiding danger from the point of view of complications and anatomical formations of the mandibular nerve and maxillary sinus. Aesthetics in the frontal zone, where implants are most often installed in the hole of the removed tooth, require that the implant's orthopedic interface is as close as possible to the anatomical axis of the tooth. This can be achieved by using intraoperative orthopedic positioning of the implant-abutment interface axis. The orthopedic Protocol is simplified as much as possible. In the absolute majority of cases, the possibility of direct prosthetics is realized. Priority is given to planning, forecasting the results obtained and rehabilitation focus of the team members' work.

Conclusion. It should be noted that performing two or more augmentation procedures in the same area reduces tissues' regenerative capabilities and shifts the orthopedic guidelines necessary for installing implants in a rational position in the jaw. In the first place, from the point of view of methodology and standardization of IDP protocols, comes the experience of a team of specialists, coherence of actions at the stage of direct prosthetics. It would be best to have experience in maxillofacial surgery and sufficient qualifications of the orthopedic component—an orthopedic doctor and a dental technician. Orthopedic planning before the stage of surgical care gives an idea of the final work results and reduces the time of direct prosthetics on the day of surgery. The ability to work in a team, combining various methods of pre-prosthetic reconstructive surgery, guarantees a predictable result. The entire team of specialists needs to be trained in IDP protocols. The use of helical conical and angular conical abutments for transocclusal fixation of orthopedic structures reduces dental rehabilitation time and reduces the trauma of operations. The use of both protocols (the first: a surgeon - orthopedic doctor without taking casts, and the second: a surgeon — orthopedic doctor - technician) simplifies, formalizes and standardizes the IDP methodology.

References

1. Ivanov S. Yu., Muraev A. A., Solodkiy V. G., Yamurkova N. F. Modern methods of reconstruction of the alveolar process of the upper jaw and the alveolar part of the lower jaw during dental implantation // Collection of scientific papers of the X All-Russian scientific and practical conference with international participation "New technologies in dentistry and implantology". — 2010. — p. 80-84.

2. Alimsky A.V., Dolgoarshinykh A.Y. Dental implantation as the best alternative to traditional orthopedic treatment methods of adolescents and young adults // Stomatology of children's age and prevention. — 2008. — Vol. 7. — No. 3. — P. 52-54.
3. Put V. A., Mitroshenkov P. N., Kumachkov D. A. pre-Prosthetic reconstructive surgery, angular implantation, regenerative technologies and the role of biocomposite materials in the maxillofacial region // Collection of works of the all-Russian scientific and practical conference "application of composite material collapan in bone surgery". — Moscow, 2013. — Pp. 56-64.
4. Masis G. I. Charity event in the Moscow maxillofacial hospital for war veterans // Dentistry today. — 2011. — №8 (108). — p. 39.
5. Put V. A., Teplov E. V., Spiridonov a.m., Efimenko K. V. possibilities of dental rehabilitation using implants in an elderly patient. Replantation in conditions of discredited bone // Dental implantology and surgery. — 2012. — №2 (7). — Pp. 79-82.
6. Ivanov S. Yu., Olesova V. N., ugrin M. M., Shirokov Yu. E. standards of dental implantology to create a quality management system for treatment // Clinical dentistry. - 2004. — No. 4. — Pp. 56-59.
7. Solodkiy V. G. (Nizhny Novgorod State Medical Academy). Main aspects of prosthetics with support on implants. Clinical examples // X all-Russian scientific and practical conference "Topical issues of dentistry — 2011". — Rostov-on-don, November 23, 2011.
8. Put V. A., Kalashnikova O. Yu., Kumachkov D. A. Safety and effectiveness in outpatient dentistry, sedation — a key factor in the dental rehabilitation program. Proceedings of the first interdisciplinary Congress on head and neck diseases "medicine of the XXI century: an interdisciplinary approach to the pathology of the head and neck organs" // Oncosurgery. — 2013. — Vol. 5. — Special issue No. 1. — P. 6.
9. Put V. A., Sayants S. A., Sadovsky V. V. A simple solution in a complex clinical case, the principle of the "four" zygomatic 550 taking into account the anatomy of the sinuses. Clinical case // Maestro of dentistry. — 2013. — №2, (50). — Pp. 10-14.
10. Put V. A., Solodkiy V. G. Direct intraoperative prosthetics based on implants: surgical and orthopedic aspects // dentalmarket. — 2014. — no. 2. — Pp. 41-47.
11. Put V. A., Solodkiy V. G., Svyatoslavov D. S. the Practice of using transcular, angular and polycortical implantation protocols in patients with extreme upper jaw atrophy // Chief doctor of the South of Russia. — 2018. — May (61). — Pp. 26-29.