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# Comprehensive patient rehabilitation while performing immediate dental implant placement with the use of information-wave therapy (literature overview)

Mavidis Kharalampos<sup>1\*</sup> Put V.A.<sup>2</sup>, Tarasenko S.V.<sup>3</sup>, Reshetov I.V.<sup>4</sup>

<sup>1</sup> Mavidis Kharalampos post-graduate student of the Department of surgical dentistry, Moscow state medical University. I. M. Sechenova Ministry of the Health of Russia (Sechenov University) Moscow, Mozhaishk Val d 11. <sup>2</sup> MD, Professor, Department of Oncology, radiotherapy and plastic surgery, Moscow state medical University. I. M. Sechenova (Sechenov University). <sup>3</sup> MD, Professor Head of the Department of surgical dentistry, Moscow state medical University. I. M. Sechenova Ministry of Health of Russia (Sechenov University) Moscow, Mozhaishk Val d 11. <sup>4</sup> MD, Professor, academician of the Russian Academy of Sciences, head of the Department of Oncology, radiotherapy and plastic surgery of the medical faculty of the First Moscow state medical University. I. M. Sechenova (Sechenov University), head of the Department of Oncology and plastic surgery of the Institute of advanced training of the Federal Medical and Biological Agency.

**Correspondence:** Mavidis Kharalampos post-graduate student of the Department of surgical dentistry, Moscow state medical University. I. M. Sechenova Ministry of the Health of Russia (Sechenov University) Moscow, Mozhaishk Val d 11 Email: dr.mavidis@hotmail.com

## ABSTRACT

The advantage of immediate implantation is the reduction of the patient's rehabilitation time. Protocols of intraoperative immediate prosthetics in implant-prosthetic rehabilitation of patients require prototyping and design of treatment results. The use of drugs in postoperative is often accompanied by side effects. The effectiveness of physiotherapeutic methods of treatment in operations of implantation of titanium structures has some limitations. The method of information-wave therapy in the complex rehabilitation of patients is effective through the use of electromagnetic radiation of ultra-low intensity. It does not occur physiologically significant tissue heating. Information-wave therapy is combined with all existing methods of treatment, which affects the prognosis of inflammatory complications.

**Keywords:** one-stage implantation, implant-prosthetic rehabilitation, intraoperative immediate prosthetics, information-wave therapy, physiotherapeutic methods of treatment

## Introduction

According to the Russian Dental Association, the extent to which the partial secondary edentia has spread in Russia, makes up 40-75% depending on the age group. The completely edentulous jaw takes place more frequently in elder age groups and

reaches 25-40% with people aged over 55 <sup>[1]</sup>.

The modern pace of dentistry development and the constant growth of patient requirements to treatment indicate the necessity to think over the available dentist methods in order to optimize the terms of treatment delivery and boost the 'comfortability' of this treatment method. The popularity of implant prosthodontics among patients and dentists is explained by the high percentage of such treatment's success, which, according to different authors, reaches 95-97% <sup>[2]</sup>. The advantages of this method in contrast to classical prosthetic bridges are small invasiveness related to hard tooth tissues neighboring the defect zone, the absence of their overloading. The mastication load spreading, which is close to the physiological one, takes place along the implant

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axis towards bony tissues, slows down the crest atrophy, which is of relevant importance in case of the partially or completely edentulous jaw. The dental implants have also recommended themselves well as a means of improving the full denture fixation on a toothless jaw [3].

The immediate dental implant placement is a method that allows to substantially reduce the treatment terms. This protocol uses monolithic and collapsible implants (intrabone parts of which are inseparably connected to abutments). In the latter, an abutment or a temporary crown is fixated on the implant immediately at the time of its installation, and the healing of soft tissues takes place around this available suprastructure, in a transgingival way [4].

Therefore, the implant reentry - the second surgical stage - is excluded from the treatment regimen. Nikitin submitted the retrospective analysis results of clinical consistency of 5274 implants installed from 2005 to 2015. The conducted research revealed the high survivability rates of one-stage monolithic implants and two-stage collapsible implants on the levels of 92.94 and 95.86 accordingly, the differences were not statistically essential. The customer satisfaction score also showed statistically comparable results (4.40 and 4.14 on a scale from one to five). At the same time, there was noticed the dependability of the customer satisfaction score on the terms of performed treatment. The reduction of treatment terms and medical treatment frequency increases customer satisfaction [5].

Many authors note the advantages of immediate implant placement into alveolar sockets of removed teeth in cases of tooth granuloma and other forms of periodontics complications.

In the modern conditions, the implantation protocols involving dental implant placement into the alveolar socket and intraoperative immediate dentoprosthetic rehabilitation are in the most demand. The unmatched advantage of these implants used together with the technology of intraoperative immediate dentoprosthetic rehabilitation is the fact that a patient starts using the dentures immediately after the operation. In the case of dental implant placement with immediate functional loading, a permanent non-removable prosthesis is fixed on implants upon the termination of 3 days; as a rule, with screw-retained fixation of orthopedic superstructures to the installed implants [6].

There are certain risks, the requirements set to a specialist team involved in the process of immediate dentoprosthetic rehabilitation, are quite

high. You need experience in planning orthopedic treatment, as well as the development of CAD-CAM technologies, maxillofacial surgery [7,8].

Despite the fact that nowadays there is a sufficient number of miscellaneous means and methods aimed at the rehabilitation of patients after dental implantation, none of them can be referred to as universal. The scientific literature has not yet covered the issues of comprehensive patient rehabilitation to a sufficient extent; in the first place, when it comes to those with the use of drug-free and physiotherapeutic treatment methods. There are publications highlighting the complications occurring at the time of treatment [9, 10]. The majority of researchers suggest applying antibiotic therapy combined with immunocorrection and physiotherapy [11].

One of the factors influencing the development of wound infection is the level of microbial content. G.D.Akhmetov [12]. To prevent the development of inflammatory complications, physiotherapy methods are often used to make anti-inflammatory, regeneration, and immunocorrection effects that are quite well-grounded reasons for applying them after dental implant placement.

Therapeutic intervention with the information-wave therapy (IWT) allows to correct intrinsic cellular metabolism from the outside, reducing the discomfort symptoms after dental interventions. The Information-Radiowave Therapy is not a physiotherapeutic technology requiring special conditions for application (in a medical and preventive treatment facility) and control provided by medical staff and can be used by patients at home on the basis of physician's recommendations [13].

The IWT basis is formed by the biofeedback, implemented by the interaction of electromagnetic radiations in millimeter, infrared, and visible ranges, modulated by information signals of infralow frequencies identical to those of healthy organs [14].

The application of information-wave therapy when conducting immediate dental implant placement and protocols of intraoperative immediate dentoprosthetic rehabilitation is relevant.

## Materials and Methods:

Materials and methods used for writing this article are the retrospective analysis of scientific sources available to the public in the national and foreign literature.

## Results and Discussion:

The majority of specialists avoid performing immediate implant placement and intraoperative immediate dentoprosthetic rehabilitation referring to the previous postoperative complications, in the first line, suture line disruption, and implant disintegration. Dentists refer to the insufficient number of researches on the application of physical (physiotherapeutic) factors for improving bone integration in the screw implant area with immediate loading that determines the forecast for the development of inflammatory complications.

The major risks while implant installing into the alveolar socket and subsequent intraoperative immediate dentoprosthetic rehabilitation are caused by insufficient primary implant stability and dental prosthetics protocol violation. Therefore, the key factors of preventive therapy are the compliance of the established treatment protocols and professional work experience.

The literature analysis has shown that drug administration for the treatment and prevention of complications in the maxillo-facial area after the operative intervention has proved to be not always effective and is concurrent with adverse events such as allergic reactions, dyspeptic disorders, and toxic reactions of blood cells.

According to Akhmedov, upon conduction of dental implant placement operation, a whole prescription set is necessary: local antimicrobial drugs, analgesics, and systemic antibiotics, but one should not forget about other preventive means, too: reduction of operation time, fighting nosocomial infection, the compliance of aseptic principles, equipping the operation room with germicidal lamps, etc.

To prevent the development of inflammatory complications, physiotherapy methods are often used to make anti-inflammatory, regeneration, and immunocorrection effects that are quite well-grounded reasons for applying them after dental implant placement <sup>[15]</sup>.

The combined application of physiotherapeutic methods and ozone therapy substantially boosts the effectiveness of dental implant placement due to the prevention of inflammatory complications development strengthening intrabone implant, etc. Ozone is bactericidal in action; it potentiates antibiotics effect by increasing microbial susceptibility to them and not causing the selection of antibiotic-resistant strains.

Although to achieve the best therapy results, the above-mentioned methods are usually used as a single set, the frequency of inflammatory complications does not reduce, that speaks to the fact that the introduction of more effective

rehabilitation technologies in the rehabilitation measures package when performing immediate dental implant placement is essential, this is under the condition of treatment protocol compliance by specialists.

A new scientific direction differs in concept from other medical technologies in its approach to human health. Due to the multi-year researches conducted by Bessonov, Semeni, Kalmykova, Put, and others based on the Scientific Center of Medical Information LIDO, there has been established that body cells can generate radio waves and receive them <sup>[16]</sup>.

At the moment, the information-wave therapy (IWT) implementation is achieved by the way of using special therapeutic devices. The Kamerton devices, designed by the Scientific Center of Medical Information LIDO, do not require special conditions for their application, approved for their use by the RF Ministry of Healthcare. The information-wave therapy method was used with patients when performing implant placement operations, SFE procedures, bone block transplantation, bone grafting of jaw ridge bones, multiple tooth removals, treatment of deep dental caries, after odontopreparation of vital teeth for crowns, periodontics prevention and comprehensive treatment, and inflammatory processes of the maxillo-facial area. The transmitter's handpiece of the Kamerton device is perpendicularly placed above the chosen area being in contact with skin. The total duration of one procedure lasts 20-25 minutes and the treatment course is 10 days. In the acute period (days 1-4), the procedures are performed 5-6 times a day, thereafter - twice a day.

The therapy method, developed for dentistry and maxillo-facial surgery -the information-wave therapy- is applied in the head and neck area and allows to correct the intrinsic cellular metabolism from the outside, reducing the discomfort symptoms after dental interventions. The evidence of the information-wave therapy effectiveness combined with medical treatment was the high percentage of the process stabilization with 96% of patients diagnosed with chronic generalized parodontitis with mild severity and 86% diagnosed with chronic generalized parodontitis with medium severity.

The positive results of the Kamerton method were generally achieved in groups with more than 91.6% of patients that were clinically proved by X-ray data, scores of gum, and plaque indexes <sup>[17]</sup>.

Polyakova, who has conducted her research on the basis of the Dental Polyclinic No.3, LTD, also

indicated the effectiveness of IWT. This author established that using the IWT while affecting biologically active points and the tooth root apex projection during 20 minutes in case of chronic fibrous periodontitis once, three times in case of chronic granulomatous periodontitis, and four procedures daily in case of chronic granulating periodontitis, promoted the clinical rehabilitation of patients.

Using the IWT in the comprehensive treatment of chronic granulating periodontitis leads to the reduction of microbial content level in the mucous tunic of the mouth, the increase of S-IgA, IL-1f3, INF-y, IL-8 levels, and the reduction of lysozyme concentration. [18].

The peculiarity of using this method in dentistry is the fact that it enables the immediate effect on the target affected organ, as well as effecting along the nerve trunk, vessels that increase the method effectiveness in the postoperative period. The postoperative rehabilitation of patients is done more effectively to a larger extent if combined with traditional treatment.

### Conclusion:

The retrospective analysis of scientific sources available for the public in the national and foreign literature has shown that recently there has been an increase in the popularity of immediate implant placement as a method allowing to substantially reduce the treatment terms. Implantation protocols involving the intraoperative immediate dentoprosthetic rehabilitation, including into the alveolar socket area, are most in demand. The unique advantage of these implants used together with the technology of intraoperative immediate dentoprosthetic rehabilitation is the fact that a patient starts using the dentures immediately after the operation.

Since most patients undergo the package of rehabilitation measures 'at home', that reduces the control of medical staff and increases the risk of complications, one should increase the motivation and responsibility levels of patients when prescribing a postoperative rehabilitation program. Any physiotherapeutic impacts on the implanted area are limited in time, radiation dose, and the possibility to use them at home. Using the Kamerton devices as an additional treatment when performing different reconstructive procedures in the mouth cavity and implant installing operations raises patients' motivation to conduct the performed treatments.

Using protocols for comprehensive rehabilitation of patients with the use of information-wave therapy method after conducting immediate dental implant placement and intraoperative immediate dentoprosthetic rehabilitation with the support of dental implants reduces the number of adverse cases and time allocated for postoperative rehabilitation of patients to a greater extent, that also plays a significant role in enhancing direct care quality. At the same time, the authors have noticed the cases of pain syndrome increase with proinflammatory processes in the mouth cavity and the absence of drainage function in the inflammatory area in place. Moreover, there are certain legal aspects of using medical equipment at home. This limits the prospects for domiciliary technology applications.

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