THEORETICAL BASIS AND PRACTICAL SIGNIFICANCE OF DENTAL IMPLANTOLOGY

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Annotation: *Dental implantology is one of the most widely used innovative areas in modern dentistry, which serves to prevent tooth loss and improve the quality of life of patients. This article describes in scientific language the classification of implants, the implantation process and its important aspects, possible problems and methods for their prevention. The article is intended for specialists and students involved in implantology.*

Dental implantology is one of the most important areas of modern dentistry, which serves to restore the chewing function of patients, improve their aesthetic appearance and improve the overall quality of life. Since the middle of the 20th century, this field has been developing rapidly, and today, implantology has become one of the most effective methods of strengthening dental prostheses. The difficulties encountered in the early implantation processes are now being overcome with the help of modern technologies, biocompatible materials and advanced surgical techniques. One of the main principles of modern implantology is based on the process of osseointegration, in which the implant directly fuses with the bone and remains strengthened. For successful implantation of implants, their correct placement, the patient's general health and the condition of the jawbone are important. Therefore, each stage of the implantation process must be carefully planned. In modern practice, implants are classified according to several criteria. According to their structure, there are plate and screw implants, while plate implants are used in cases where there is insufficient bone, while screw implants are widely used due to the speed of the osseointegration process. According to the material, implants can be made of titanium, zirconium and ceramics. Titanium implants have high biocompatibility and are the most widely used type, while zirconium implants have aesthetic advantages and do not cause allergic reactions. According to the installation method, implants can be used in one-stage and two-stage methods. In one-stage implantation, the implant is loaded immediately after installation, while in the two-stage method, the implant first integrates with the bone, and then the prosthetic part is placed.

The dental implant procedure consists of several important stages, the successful implementation of which depends on the correct diagnosis, high-quality performance of the surgical procedure and the rehabilitation process. At the first stage, the patient's general health and the condition of the jawbone are assessed, and suitability for implantation is checked using X-ray or computed tomography. At the next stage, the

implant is placed in the bone and a period of 3–6 months is allocated for its osseointegration. After this process, a prosthetic part is installed on the implant, which allows the patient to fully restore chewing function. After the procedure is completed, the patient must follow the rules of hygiene, undergo dental check-ups and monitor the condition of the implant. However, the implantation process can sometimes be complicated by various complications. The most common problems include infection and inflammation, improper placement of the implant, and failure of osseointegration. To prevent these complications, proper diagnosis before implantation, strict adherence to antiseptic rules, and an individual approach to the patient are of great importance. Dental implantology is one of the rapidly developing areas in dentistry, and its future prospects are also significant. The strength and osseointegration of implants are being further improved with the help of new materials and technologies. Implantation processes are expected to be further improved using 3D printing technologies, nano-cells, and artificial intelligence. Therefore, the development of this field will ensure higher quality and efficiency of dental treatment in the future. Dental implantology is one of the most important areas of modern dentistry, serving to restore chewing function, improve aesthetic appearance, and improve overall quality of life of patients. Since the middle of the 20th century, this field has been developing rapidly, and today, implantology has become one of the most effective methods of strengthening dental prostheses. The difficulties encountered in the early implantation processes are now being overcome with the help of modern technologies, biocompatible materials, and advanced surgical techniques.

One of the main principles of modern implantology is based on the process of osseointegration, in which the implant is directly connected to the bone and remains strengthened. For the successful installation of implants, their correct placement, the general health of the patient and the condition of the jawbone are important. Therefore, each stage of the implantation process must be carefully planned. In modern practice, implants are classified according to several criteria. According to their structure, there are plate and screw implants, while plate implants are used in cases where there is insufficient bone, screw implants are widely used due to the speed of the osseointegration process. According to the material, implants can be made of titanium, zirconium and ceramics. Titanium implants have high biocompatibility and are the most widely used type, while zirconium implants have aesthetic advantages and do not cause allergic reactions. According to the installation method, implants can be used in one-stage and two-stage methods. In a one-stage implantation, the implant is loaded immediately after placement, while in a two-stage method, the implant first integrates with the bone, and then the prosthetic part is placed.

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However, the implantation process can sometimes be complicated by various complications. The most common problems include infection and inflammation, implant misalignment, and failure of osseointegration. To prevent these complications, proper pre-implantation diagnostics, strict adherence to antiseptic rules, and an individual approach to the patient are important.

Dental implantology is one of the rapidly developing areas in dentistry, and its future prospects are also of great importance. The strength and osseointegration of implants are being further improved with the help of new materials and technologies. Implantation processes are expected to be further improved using 3D printing technologies, nano-cells, and artificial intelligence. Therefore, the development of this area will ensure higher quality and efficiency of dental treatment in the future.

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