

PERMANENT PROSTHETICS ON DENTAL IMPLANTS

Safarov M.T.¹, Tashpulatova K.M.¹, Ruzimbetov Kh.B.¹, Khamidova A.¹

¹Tashkent State Dental Institute

Abstract. The article analyzes the features of prosthetics on dental implants and the process of osseointegration, which is a key stage of successful dental implantation. Osseointegration is the process by which an implant is fused to bone tissue, providing stability and strength. The article discusses factors affecting the process of osseointegration, such as bone quality, surgical technique, and implant quality.

Keywords: dentistry, prosthetics, dentition, dental implantation, dental implants.

For citation:

Safarov M. T., Tashpulatova K. M., Ruzimbetov Kh. B., Khamidova A. Permanent prosthetics on dental implants. *Eurasian Journal of Otorhinology - Head and Neck Surgery*. 2023;2(3):70–73. <https://doi.org/10.57231/j.ejohns.2023.2.3.012>

НЕСЪЁМНЫЕ ПРОТЕЗИРОВАНИЕ НА ЗУБНЫХ ИМПЛАНТАТАХ

Сафаров М.Т.¹, Ташпулатова К.М.¹, Рузимбетов Х.Б.¹, Хамидова А.¹

¹Ташкентский государственный стоматологический институт

Аннотация. В статье анализируются особенности протезирования на зубных имплантатах и процесс остеоинтеграции, который является ключевым этапом успешной зубной имплантации. Остеоинтеграция – это процесс, при котором имплантат приживается к костной ткани, обеспечивая стабильность и прочность. В статье рассматриваются факторы, влияющие на процесс остеоинтеграции, такие как качество кости, хирургическая техника и качество имплантата.

Ключевые слова: стоматология, протезирование, зубной ряд, зубная имплантация, зубные имплантаты.

Для цитирования:

Сафаров М.Т., Ташпулатова К.М., Рузимбетов Х.Б., Хамидова А. Несъемные протезирование на зубных имплантатах. *Евразийский журнал оториноларингологии - хирургии головы и шеи*. 2023;2(3):70–73. <https://doi.org/10.57231/j.ejohns.2023.2.3.012>

INTRODUCTION

The latest trends in dental implantation related to the reduction of rehabilitation duration are also discussed. The article discusses new methods and technologies that can speed up the process of osseointegration and reduce the time to install an orthopedic structure.

THE PURPOSE

Review the main aspects of prosthetics on dental implants, including the choice of material for orthopedic structures, the process of osseointegration and the latest trends in dental implantation. This information can be useful for dentists and patients who are interested in this topic. Dental implants provide a stable foundation

for permanent dentures, allowing patients to fully utilize their dental restorations without having to remove them at night or while eating. This significantly increases the comfort and quality of life of patients.

MATERIAL AND METHODS

Single dental implant is a popular option for patients with a short period of toothlessness. It allows you to replace a missing tooth without having to treat adjacent teeth, as is required for bridge prosthetics. The dental implant also provides a stable and solid foundation for a dental crown that looks and functions like a natural tooth.

The use of dental implants allows patients to avoid having removable dentures, which

significantly improves their quality of life and self-esteem. Bone integrated dental implants are a reliable and effective way to restore dental function and aesthetics in patients with partial adentia.

RESULTS

The choice of implant and its upper-lower position vary depending on the diameter of the intended restoration and can be adjusted for different tooth sizes. For example, the typical root diameter of the maxillary central incisor is 8.0 mm; the average implant diameter is 4.0 mm. Therefore, a gradual transition from 4.0 to 8.0 mm requires a distance of 2.5 to 3.0 mm. If this is done at too short a distance, the restoration will be excessively contoured or look unnatural. In contrast, many of the central and lateral incisors of the lower jaw are smaller than 4.0 mm at the junction of cement and enamel. Thus, aesthetic restoration on a 4.0 mm implant is not possible. Smaller diameter implants (about 3.0 mm) are available for aesthetic restoration in these areas. It is also possible to use a larger implant (5.0 - 6.0 mm) for the restoration of molars in patients with adequate bone tissue.

The size of the restoration should always be taken into account during the treatment planning stage, so that the implant of the appropriate size is placed in the ideal location.

Planning treatment for the restoration of a single tooth, especially in the anterior aesthetic area, is one of the most difficult problems faced by an implant restorer. Implant placement for both aesthetic and biomechanical loading (to minimize screw loosening) is particularly important. In addition, at the stage of treatment planning, it is important to make a decision about installing an implant with an anti-rotation element built into the system (for example, a slot or hexagon).

When planning implantation treatment in the anterior aesthetic area, it is important to take a close look at the soft tissues that will frame the restoration. Ultimately, it may not be easy to achieve a fully formed papilla between the repaired implant and adjacent teeth. If the interdental tissue and underlying bone were already lost before the implant was placed, it may not be possible to achieve perfect papillary contours. The literature contains recommendations that help predict whether a proper soft tissue contour can be maintained. As

shown in the diagram (Fig. 13-19), the ratio of the interdental bone to the interproximal contact seems to predict whether an interdental papilla will be present or not. If the distance between the bone and the contact site is small (~5 mm), a papilla is usually present. If the distance is large (~8 mm), the papilla would normally be absent without additional soft tissue grafting.

Bone resorption around dental implants can be caused by premature loading or repeated overloads. Vertical or angular bone loss is usually characteristic of bone resorption caused by occlusal trauma (BOX 13-5). When the pressure from traumatic occlusion is concentrated, bone resorption occurs due to the activity of osteoclasts. In the natural dentition, bone remodeling usually occurs after a strong stress concentration is reduced or eliminated. However, in the system of integrated bone implants, after resorption of the bone, it is usually not formed again. Since dental implants most effectively resist forces directed primarily along their long axis, lateral forces on the implants should be minimized.

Lateral forces in the back of the mouth are more destructive than lateral forces in the front of the mouth. If they cannot be completely removed from the implant prosthesis, efforts should be made to distribute them evenly over as many teeth as possible.

Implant-supported prosthetics should be designed to minimize damaging forces at the implant-bone interface, paying particular attention to occlusion. On the protrusions supported by the implants, you can create more gentle slopes, creating more vertical resultant forces and a shorter torque lever.

Whenever possible, the relationship between the tubercle and the fossa should be established with maximum intercuspitation without eccentric occlusal contacts. A single-tooth maxillary restoration is vulnerable to screw loosening as a result of occlusal contacts, which typically create an oblique resultant force with increased torque on the locking screw. Optimal implant orientation effectively reduces these forces.

In general, the location and tilt of the force should be taken seriously during the recovery phase of implant treatment. Divergent placement of the implant increases the moment through which force is transmitted to the bone-implant contact

surface; this may exceed the bone resorption threshold. Manufacturers of implant housings have made interchangeable components to change the angles of implant placement. However, it has been shown that an increase in the abutment installation angles also leads to an increase in stresses at the bone-implant interface. Angled abutments can solve immediate aesthetic or contour problems by masking potential long-term consequences that occur when an implant is inserted that is poorly planned or dictated by the patient's anatomy.

Improper placement of implants can also lead to excessive cantilevers or forces that can overload the implant housings. If possible, dental implants should be connected in such a way that forces can be more evenly distributed between several implants. Ideally, one implant should be placed on each repaired tooth. This number is especially important when shorter implants are placed in lower-quality bone. When implants longer than 13 mm can be installed in dense bone, it is acceptable to install two for every three teeth being replaced. Complete arch restoration should not be considered with less than six implants in the upper jaw and five in the lower jaw. Implant consoles should be kept as short as possible. However, it is possible to connect over considerable distances using five well-integrated attachments in the front of the lower jaw. Quite often, it is possible to attach to the first molar tooth. Equations based on the distribution and attachment length were proposed.

It has been suggested that connecting one bone integrated implant to one natural tooth with a fixed denture may create excessive forces due to the relative immobility of the bone integrated implant compared to the functional mobility of the natural tooth. During operation, the tooth moves within its periodontal ligament, which can create a load on the implant neck that is twice as high as the expected load on the prosthesis. Potential problems associated with this type of restoration include (1) impaired bone integration, (2) destruction of the cement on the natural abutment, (3) loosening of the screw or abutment, and (4) destruction of the prosthesis component on the implant. This situation is encountered clinically when the posterior abutment is lost in the dental arch and a permanent prosthesis is required to connect a single implant

to a natural tooth. If possible, a permanent denture should be used with full support on implants with two or more implants. However, anatomical limitations of the maxillary sinus or mandibular canal often limit recovery efforts directed at a single attachment point.

If it is necessary to connect the implant to a natural tooth, several implants or abutments should be used for the natural tooth. Semi-daily mounting in a prosthesis between the implant and the natural tooth can solve potential problems. However, in most cases, when a load is applied to the pontoon, the additional movement at the attachment point actually increases the cantilever effect on the implant abutment. In practice, the only advantage of a half-day attachment may be that it allows you to remove the crown-the abutment of the implant, held by a screw, for periodic evaluation.

When circumstances dictate the use of a natural dental abutment, a telescopic attachment should be considered. It attaches firmly to the natural tooth and can prevent tooth decay if loosening occurs. Intermediate cement is used to attach the prosthesis to the frame. If it is washed out of the implant crown, the natural tooth is still protected

Implants and prosthetics on implants are an effective and reliable solution for patients with partial adentia, especially in cases where traditional methods of treatment are ineffective or not applicable. The success of such prosthetics requires careful planning and attention to detail. The surgical placement of the implant and the development of the prosthesis should be coordinated and performed taking into account the optimal placement of the implant, occlusion, aesthetics and tissue health.

The process of prosthetics on implants usually involves a two-step surgical technique that takes time to heal the bone around the implant. After that, a second operation is performed, during which the implant devices are installed in place. Then the prosthesis is made with a screw fixation to restore function and appearance.

There are several implant systems, each of which has its own components for restorative treatment. Problems associated with prosthetics on implants may include loosening of the screws and loss of bone mass. However, with proper planning, installation and maintenance, these problems can

be minimized.

CONCLUSION

Implant-based prosthetics are an effective and reliable treatment method for patients with partial adentia. However, it is necessary to take into account the individual characteristics of each patient and carry out careful planning and monitoring.

CONFLICT OF INTERESTS

The authors declare the absence of obvious and potential conflicts of interest related to the publication of this article.

SOURCES OF FUNDING

The authors state that there is no external funding for the study.

AVAILABILITY OF DATA AND MATERIALS

All data generated or analysed during this study are included in this published article.

AUTHORS' CONTRIBUTIONS

All authors contributed to the design and interpretation of the study and to further drafts. All authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All applicable international, national, and/or institutional guidelines for the care and use of animals were followed.

CONSENT FOR PUBLICATION

Not applicable.

PUBLISHER'S NOTE

Journal of "Eurasian Journal of Otorhinolaryngology - Head and Neck Surgery" remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Article received on 22.09.2023

Accepted for publication on 29.09.2023

КОНФЛИКТ ИНТЕРЕСОВ

Авторы заявляют, что данная работа, её тема, предмет и содержание не затрагивают конкури-

рующих интересов.

ИСТОЧНИКИ ФИНАНСИРОВАНИЯ

Авторы заявляют об отсутствии финансирования при проведении исследования.

ДОСТУПНОСТЬ ДАННЫХ И МАТЕРИАЛОВ

Все данные, полученные или проанализированные в ходе этого исследования, включены в настоящую опубликованную статью.

ВКЛАД ОТДЕЛЬНЫХ АВТОРОВ

Все авторы внесли свой вклад в подготовку исследования и толкование его результатов, а также в подготовку последующих редакций. Все авторы прочитали и одобрили итоговый вариант рукописи.

ЭТИЧЕСКОЕ ОДОБРЕНИЕ И СОГЛАСИЕ НА УЧАСТИЕ

Были соблюдены все применимые международные, национальные и/или институциональные руководящие принципы по уходу за животными и их использованию.

СОГЛАСИЕ НА ПУБЛИКАЦИЮ

Не применимо.

ПРИМЕЧАНИЕ ИЗДАТЕЛЯ

Журнал "Евразийский журнал оториноларингологии - хирургии головы и шеи" сохраняет нейтралитет в отношении юрисдикционных претензий по опубликованным картам и указаниям институциональной принадлежности.

Статья получена 22.09.2023 г.

Принята к публикации 29.09.2023 г.

ЛИТЕРАТУРА / REFERENCES

1. Tashpulatova K. et al. Technique for eliminating traumatic occlusion in patients using Implant-supported bridges // European Journal of Molecular & Clinical Medicine. – 2020. – Т. 7. – №. 2. – С. 6189-6193.
2. Safarov M.T. Technique for eliminating traumatic occlusion in patients using Implant-supported bridges //European Journal of Molecular & Clinical Medicine. – Т. 7. – №. 02. – С. 2020.
3. Сафаров М. Т., Ахмаджонов М., Рузимбетов А. Изучение микробиологического статуса у больных с перимплантатами в области мостовидных протезов //Conferences. – 2022. – С. 138-138.
4. Safarov.M.T.. Evaluation of the effectiveness of fixed prosthetics on dental implants at different periods of observation //Impact Factor: 4.9. – С. 22.
5. Safarov M. T., Asemova S. A. Prospects of using mathematical modeling in dentistry (a review) //Ўзбек тиббиёт журнали тахририй маслахат кенгаши редакционний совет Узбекский медицинский журнал Editorial Board of the Uzbek medical journal. – С. 19.
6. Мусаева К. А. и др. Биомеханика несъемных полнудюговых протезов с опорой на имплантаты //Conferences. – 2023. – С. 370-372.
7. Khabilov N. L. MT Safarov et al. Characteristics of the erasability of hard dental tissues and the effect on subsequent orthopedic treatment //British View. – 2022. – Т. 7. – №. 1.
8. Сафаров М. и др. Влияние несъемных зубных протезов различной конструкции на микробиологические и иммунологические показатели полости рта // Stomatologiya. – 2014. – Т. 1. – №. 1 (55). – С. 18-23.
9. Сафаров М., Мусаева К., Шарипов С. Олинмайдиган кўприксимон тиш протезларининг оғиз бўшлиғи микробиологик ҳолатига таъсири //Stomatologiya. – 2017. – Т. 1. – №. 2 (67). – С. 51-54.
10. Habilov N. et al. Optimization of Dental Culture at School Children and Teachers Residing Prearal-Region //International Journal of Pharmaceutical Research (09752366). – 2020. – Т. 12. – №. 2.