

Use of synthetic materials in dental implantation

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Annotation. Restoring lost teeth with dental implants is currently one of the most effective and physiologically sound methods of dental rehabilitation. High implant survival rates, improved patient quality of life, and predictability long-term results have led to the widespread adoption of implant technologies in clinical practice. However, the success of dental implantation largely depends on the condition of the jaw bone, particularly its volume, density, and anatomical features. In the last ten years, special attention has been paid to synthetic and allogenic osteoplastic materials, which allow to avoid the donor stage of surgery, have high biocompatibility and demonstrate comparable clinical results in dental implantation. Despite a large number of publications, the issue of the optimal choice of osteoplastic material depending on the anatomical zone (upper or lower jaw), the type of bone defect and the clinical situation remains controversial.

Keywords: dental implants, osteoplastic materials, upper or lower jaw, stability of dental implants, the quality of the bone structure, bone density.

The aim of the study was to evaluate synthetic osteoplastic materials used in dental implantation in the upper and lower jaws and to determine optimal approaches to their clinical use.

Materials and methods: Among the 60 subjects studied, 25 (41.7%) were men and 35 (58.3%) were women. The patients' ages ranged from 20 to 75 years, with a mean age of 45.16 ± 0.68 years, regardless of gender. The average age of the patients was: men – 51.4 ± 1.86 years; women – 46.6 ± 0.68 years. When patients came to the clinic, their complaints, medical history, and the results of additional research methods were studied and analyzed. When collecting anamnesis, the etiology of defects, the chronology of therapeutic and orthopedic care provided were identified, previously suffered diseases and the presence of general somatic diseases and allergic reactions were clarified. Attention was paid to the presence of facial asymmetry, and the condition and functional integrity of the Temporomandibular joint were studied. The work was carried out at Tashkent State Medical University

Most patients had included defects of the dental arches 38 (63.3%), including 16 (26.7%) in the upper jaw, 19 (31.7%) in the lower jaw, and 3 (5%) in both jaws. Terminal defects were detected in 14 (23.3%) patients: 9 (15%) of which were unilateral and 5 (8.3%) were bilateral. 8 (13.3%) patients had combined defects.

Research results. As a result of the comparative clinical and analytical study, it was established that the use of both synthetic and osteoplastic materials allows to achieve satisfactory clinical and radiographic results in dental implantation of the upper and lower jaws.

Analysis of the obtained data showed that the choice of osteoplastic material affects: the volume of formed bone tissue; the timing of regenerate remodeling; the quality of the bone structure; the frequency and nature of postoperative complications; the stability of dental implants.

In this case, not only the type of osteomaterial plays a decisive role, but also the anatomical zone of implantation, the method of bone augmentation and adherence to the surgical protocol.

Synthetic osteoplastic materials based on calcium phosphates have shown high efficiency in restoring the volume of bone tissue in the upper jaw. Clinical and radiographic data indicate: stable preservation of the volume of the regenerate; slow and controlled resorption of the material; formation of bone tissue of sufficient density for subsequent implantation.

The average bone height gain using synthetic materials was 7–9 mm. Unlike allogenic materials, synthetic osteomaterials retained their structure for a longer period of time, which is especially important for sinus lifts and large defects. However, the maturation time of the regenerate when using synthetic materials was somewhat longer and averaged 6–8 months.

The use of synthetic osteoplastic materials on the lower jaw was characterized by: high mechanical stability; good integration into dense bone tissue; minimal frequency of inflammatory complications.

However, when using exclusively synthetic materials in areas with limited blood supply, longer periods of regenerate remodeling (up to 7–9 months) were observed.

The most favorable results were achieved with the combined use of synthetic materials with autologous blood or fibrin matrices.

Conclusions. Synthetic osteoplastic materials provide high efficiency of bone augmentation. In the upper jaw, preference should be given to materials with high volume stability. In the lower jaw, the speed of remodeling and the quality of the regenerate are more important. The combined approach increases the predictability of clinical outcomes. The success of implantation depends on a comprehensive consideration of anatomical and clinical factors.

Literature

1. Bekjanova O.E., Mannanov J.J., “Pathogenetic role of vitamin D synthesis in the body on somatic and dental pathology” Journal of Biomedicine and Practice, volume 9, issue 1, Tashkent 2024, pp. 373-381
2. Bekjanova Olga Esenovna, Mannanov Javlonbek Jamoliddinovich “D-gipovitaminozning tish implantatsiyasi paytida asoratlarning chastotasi va xavfiga ta'siri” Journal of Dentistry and Craniofacial Research, volume 5, issue 1, Samarkand 2024, pp. 72-75
3. Bekjanova O.E., Mannanov J.Zh., “The role of vitamin D deficiency in somatic health and metabolic homeostasis of the body” Problems of Biology and Medicine, 2024, issue 2, pp. 321-326
4. Bekjanova O. E., Mannanov J. J., “The Importance of Vitamin D Synthesis in the Development of Dental Pathology” Journal of Medicine and Innovation, 12.2023, Tashkent-2023, pp. 94-103