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Biomaterials and their application in preprosthetic surgical procedure

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The loss of teeth and damage to the jaw bone occur under different circumstances. The deficit may be the result of wearing inadequate dentures, residual ridge resorption, osteoporosis, periodontal disease, trauma, tumors, radiation, etc. The deficit of bone tissue can be a substantial problem because it prevents adequate prosthetic patient care and restoration of disturbed functions of stomatognathic system. With such patients, there is often a need for preprosthetic surgical procedure through the application of various techniques and materials in order to resolve aftermentioned bone shortcomings. The most appropriate biological materials for the reconstruction are autogenous bone graft and artificial bone. With the development of technology and specific biomaterials it is tried to avoid situations that require autogenous bone grafting, since it involvs long surgical procedure with the possibility of postoperative complications. The application of synthetic biomaterials, whose properties are similar to natural hydroxyapatite, promotes the biological potential for bone tissue repair. Synthetic biomaterials have great biocompatibility and sterility and do not act antigenicaly. The disadvantages of this material are overcome by the addition of organic polymers. Thanks to the stability and flexibility of hydroxyapatite structure, a large number of ionic changes are possible, both cationic and anionic, which improve the characteristics of synthetic hydroxyapatite. Biomaterials that include different drugs, such as antibiotics, vitamins and other preparations, could be used for the treatment of complications after surgical procedures and infection of bone tissue. Our experimental studies indicate that biomaterials based on hydroxyapatite are valuable materials that can be used for preprosthetic surgical preparation.