Hap/Tcpβ Granules for Augmentation of Narrow Alveolar Bone before Dental Implant Placement

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III

Introduction. Institute of Stomatology, Oral and maxillofacial surgery department from 2005 in its clinical work widely uses biphasic calcium phosphate granules developed and produced by Riga Technical University, Riga Rudolph Cimdins Biomaterials Innovation and Development Centre.

The material is widely used after tooth extraction, in bone deficiency cases before dental implantation (sinus lift, bone transplantation, narrow alveolar bone). HAp strengthens atrophic bone for a long period, TCPβ by release of Ca and P ions improves mineralization of the natural bone, which is so necessary for good dental implant integration. Radiological densitometric analysis approves it.

After a long time of absence of teeth, alveolar bone resorbs and ridge deformities such as "knife" edge ridge develops.

Aim, Materials and Methods. From 2009 to 2017 Hap/TCPβ 0.5–1.0 mm granules implantation was performed to 345 patients aged 18–82 years.

For 9 patients with atrophy of mandibular alveolar bone up to 1–2 mm on the crest, horizontal augmentation with synthetic HAp/TCPβ granules were performed. Average growth of bone tissue was 3.1 mm and 1–2 mm of own bone allows for dental implantation. In two cases, the volume of bone tissue for implantation was insufficient; these patients underwent surgery for bone augmentation using bone marrow transplantation unit.

Five treatments have been completed, and one of them is the presented case.

Results. Patient S. A., age 53, female, had 2.12 mm width of alveolar crest in left posterior mandible. Vertical height from crest to mandibular canal was 15.03 mm. On November 29, 2012 using intraoral approach subperiostal tunnel over alveolar bone from buccal side from teeth 33 to 37 was formed and filled with granules HAp/TCP 30/70 $0.4 < d < 1$ mm 2.5 ml. On May 29, 2014 three dental implants BEGO Semados RS 3.75 x 10 mm were inserted. On November 11, 2014 implants were exposed and healing screws inserted. Prosthodontics work as metal ceramic bridge was completed in January 2015. Control on February 2017 showed stable outcome.

Conclusions. In cases of "knife" edge alveolar bone with enough thickness for dental implantation, the augmentation by implantation of HAp/TCP 30/70 granules in subperiostal tunnel results in increase of bone size and mineral density, formation of stable bone/bioceramics hybrid and successful osseointegration of dental implants.