Alveolar Ridge Augmentation using Dystopic Autogenous Tooth: 2 Year Results

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Background

Animal experiments were able to show formation of new bone in extraction alveoli of teeth of rats, when these had been filled with autologous deproteinized crushed dental material mixed with hydroxypropylcellulose. Clinically, good results have been reported with socket preservation and with the reconstruction of atrophied jaw segments with chemically modified teeth. First results showed good new bone formation within 3 months after socket preservation based on biopsies obtained from 2 patients.

A first cohort study reported the successful use of chemically and thermally unchanged autogenous crushed impacted molars for augmentation in sinus lift in human subjects. Biopsies showed an osteoconductive osteoneogenesis with both dentin and dental enamel being coated by newly formed bone. This process was based on a marked angioneogenesis.

Aim of the Study

The present study was intended to report on the results achieved 2 years after the use of autologous, chemically unchanged dental material in the context of a lateral alveolar ridge augmentation or for the filling of jaw defects.

Methods and Materials

Following extraction of the retained tooth, the tooth was crushed using a manual bone mill and augmentation of the bone defect was done using the dental material (Case 2). If full tooth blocks were required because of the size of the defect, these fragments were shaped to fit the form of the defect and fixed by means of traction screws followed by implantation in the appropriate area after a healing period between 3 and 6 months (Case 1). For any of the surgical interventions the patients were given a single preoperative oral dose of 2g amoxicillin. CBCT was obtained preoperatively as well as postoperatively after augmentation and after implantation.

For assessing the peri-implant bone, digital intramural radiographs were taken 3, 6, 12 and 24 months post-implantation. Clinical assessments comprised measurement of probing depths in 4 different implant locations and assessment of the sulcus bleeding index. Statistical analysis was done using an ITT approach, descriptive methods and Student’s t-test.

Results

Overall, 20 patients underwent surgery during the period from 2009 to 2014. In 3 patients a bone block was also used for augmentation in addition to particulate dental material. For the other 17 patients autologous dental material was exclusively used. In 4 of these patients full dental blocks were anchored in the defect region, in 7 patients particulate dental material was inserted on the buccal side of the implant for achieving appropriate aesthetic results. In 6 patients, dystopic teeth were removed, crushed and inserted in the removal defect. An overall 28 implants could be placed as planned. After uneventful healing of 3.2 months 28 implants could be prosthetically restored.

Clinically, all implants were without inflammation. The average peri-implant bone loss was 0.37 mm in the first year and 0.58 mm in the second year. Peri-implant pocket depth after 24 months was an average 1.7 mm. Bleeding on probing was not seen in any of the implants.

Conclusions

The two year results of this study show that unaltered autologous tooth material can be used for lateral, vertical and intraosseous reconstruction of defects of the alveolar ridge prior to implantation.

Case 1

Case 2

References

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