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Microcomputed tomographic analysis of bone microarchitecture after sinus augmentation with hyaluronic matrix: a case-control study

E Gurbuz[1]
E Dursun[2]
A Vatansever[3]
F Caglayan[4]

1 | Department of Periodontology, Faculty of Dentistry, Kutahya Health Sciences University, Turkey
2 | Private Practice in Periodontology, Ankara, Turkey
3 | Department of Anatomy, Faculty of Medicine, Balıkesir University, Turkey
4 | Department of Periodontology, Faculty of Dentistry, Hacettepe University, Sıhhiye, Ankara, Turkey

ABSTRACT

In case of resorbed posterior maxilla, maxillary sinus augmentation is a predictable procedure and many graft materials have been proposed for this technique. Among these, hyaluronic acid (HA) based materials were applied with bone grafts in sinus augmentation studies, with positive effects on bone formation by providing enough space between graft particles and allowing vascular, cellular invasion to the grafted area. The aim of this study was to analyse trabecular micro-architecture of augmented sinuses with hyaluronic acid- based matrix and collagenated heterologous bone graft (CHBG) by microCT, and to investigate whether hyaluronic matrix has an effect on the newly formed bone quality in terms of microarchitecture. In this case–control study, thirteen selected patients were submitted to bilateral maxillary sinus augmentation performed with lateral window approach. In this split-mouth study, right and left sinus sites were randomly assigned to test and control group. The sinus was grafted with hyaluronic matrix (Hyaloss™ matrix, ANIKA Therapeutics, Italy) and CHBG (OsteoBiol® *Apatos*®, Tecnoss®, Giaveno, Italy) in test group and only with CHBG in control group. Four months after augmentation, bone samples were harvested during implant placement and analysed for the following trabecular microarchitecture parameters using microcomputed tomography: bone volume (BV), total volume (TV), bone volume fraction (BV/TV), bone surface (BS), specific bone surface (BS/BV), bone surface density (BS/TV), trabecular thickness (Tb.Th), trabecular separation (Tb.Sp), trabecular pattern factor (Tb.Pf), and fractal dimension (FD). The results of the analysis evidenced that there was statistically significant difference only for BS/TV parameter between two groups. BS/TV was higher in hyaluronic matrix group compared with control group.

CONCLUSIONS

Based on the results, the Authors concluded that "*while HA was determined to have favorable effect on bone quality in terms of bone surface density, further studies are required with a greater sample and implant survival results. In addition, more microarchitecture analyses of augmented sinuses are essential to be able to compare microarchitecture parameters between studies*".

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