



Histological and micro-computed tomography evaluations of newly formed bone after maxillary sinus augmentation using a xenograft with similar density and mineral content of bone: an experimental study in rabbits

ABSTRACT

It has been demonstrated that new bone forms after sinus floor elevation, but the tendency of the maxillary sinus to regain the lost space after sinus floor elevation has been documented as well. To counteract the physiological shrinkage of the elevated space, the use of bone fillers has been suggested.

The aim of the present study was to evaluate possible differences in the assessment of bone formation between histological and micro-computed tomography (CT) analyses in maxillary sinuses augmented with a xenograft with similar density and mineral content of bone. Eighteen male New Zealand white rabbits were randomly divided into three groups. After the sinus mucosa elevation, in the test sites an equine collagen membrane (OsteoBiol® Evolution 0.3 mm, Tecross®, Giaveno, Italy) was placed subjacent the sinus mucosa and both sinuses were subsequently filled with similar amounts of collagenated cortico-cancellous porcine bone (OsteoBiol® Gen-Os®, Tecross®; 250–1,000 µm). Six rabbits per group were sacrificed after 2, 4, and 8 weeks of healing. Biopsies were retrieved, scanned in a high-resolution micro-CT, and subsequently subjected to histological assessments. The histological analyses showed that bone increased over time, from $7.5 \pm 2.4\%$ to $27.0 \pm 5.3\%$, between 2 and 8 weeks of healing. After 2 weeks, higher content of xenograft was found at the histological compared with the micro-CT analyses, especially in the middle regions of the sinus. After 8 weeks of healing, higher percentages of bone were found at the histological compared with the micro-CT analyses, being the differences statistically significant.

CONCLUSIONS

Within the limitation of this study, the Authors concluded that *“the outcomes of a micro-CT analysis performed in an early phase of healing may be altered when a resorbable bone substitute with similar density and mineral content of bone is applied”*.

EXPERIMENTAL STUDIES

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