



Reposition of the bone plate over the antrostomy in maxillary sinus augmentation: a histomorphometric study in rabbits

ABSTRACT

After sinus floor elevation, it is common to use membranes in order to cover the lateral access window and this approach showed better results than leaving the antrostomy uncovered. In literature different results have been reported following the two approaches and so the Authors of the present study evidenced the need of further data to describe the influence on healing of the closure of the bone window on the lateral antrostomy and on the integration of the bone window plate to the adjacent bone when ethyl-2-cyanoacrylate is used as fixative. Therefore, the aim of this experimental study was to test if the repositioning of the bony plate secured with a cyanoacrylate (test site) over the antrostomy in maxillary sinus augmentation was superior to the coverage of the antrostomy with a collagen membrane (control site) in terms of bone augmentation area and bone density. Moreover, the Authors assess tissue composition and healing processes 2, 4 and 8 weeks after sinus mucosa elevation within the elevated area and in the antrostomy. Eighteen male New Zealand white rabbits were selected and divided in three groups of different periods of healing, i.e., 2, 4, and 8 weeks, of six animals each. After the exposure of the nasal bone, a rectangular access window was prepared, removing the bony plate. A bilateral sinus mucosa elevation was performed, and the space filled with a collagenated cortico-cancellous porcine bone (OsteoBiol® Gen-Os®; TecnoSS®, Giaveno, Italy). At the test site, the bone plate was repositioned and secured to the walls of the antrostomy with drops of ethyl-2-cyanoacrylate adhesive. At the contra-lateral control sites, an equine collagen membrane (OsteoBiol® Evolution, TecnoSS®) was used to cover the antrostomy. Per group, 6 animals were sacrificed after 2, 4, and 8 weeks of healing, respectively. The histological evaluation showed that the augmented area after elevation decreased between 2 and 8 weeks from 9.4 ± 1.8 to 4.8 ± 2.8 mm² at the test and from 9.5 ± 2.6 and 5.1 ± 1.6 mm² at the control sites. Small amounts of new bone were seen after 2 weeks in both groups forming from the bony sinus walls and the area of the remaining defects decreased over time at both test and control sites. New bone density increased over time in both groups, with no statistically significant differences. Small residual defects were present both at the test sites in the margin of the bone plate, and at the control sites in the center of the antrostomy.

CONCLUSIONS

The bone healing in the elevated sinus space was similar irrespective of the coverage of the antrostomy. Even if the inference of the results from the present animal study to similar clinical situations in humans has to be considered with care, the Authors concluded that *"the protection of the antrostomy by either repositioning the bony plate or covering the window with a collagen membrane resulted in similar outcomes in terms of new bone formation and xenograft resorption inside the available area. After 8 weeks, the bony plate was well incorporated into the subjacent new bone, while at the control sites, the healing was still incomplete. Residual defects were present in both groups"*.

EXPERIMENTAL STUDIES

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