



Sinus Floor Elevation and Antrostomy Healing: A Histomorphometric Clinical Study in Humans

LATERAL ACCESS SINUS LIFT

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ABSTRACT

In the maxillary sinus floor augmentation different biomaterial are used and the healing results have been analysed, comparing them to the ones obtained by the use of autogeneous bone. In general, statistically significant differences in newly formed bone were seen between autogenous bone and synthetic bone, but the clinical outcomes were similar among groups using different grafting materials.

As a direct comparison between histomorphometric outcomes from biopsies collected from the crest or from the lateral wall of the sinus after sinus floor augmentation is still missing, the aim of this study was to compare the histomorphometric outcomes of biopsies collected from the antrostomy and from the alveolar crest after a sinus-lift procedure. To do this, 12 volunteers (5 men and 7 women with a mean age of 55.3 ± 11.7 years) were enrolled and subjected to sinus floor elevation using collagenated corticocancellous porcine bone (OsteoBiol® Gen-Os®, TecnoSS®, Giaveno, Italy). The antrostomy was covered with a collagen membrane (OsteoBiol® Evolution, TecnoSS®). A small nail in titanium was placed on the lateral wall as reference, and the flaps were sutured. After 9 months from sinus floor elevation, biopsies were collected from the alveolar crest at the implant sites and from the antrostomy, using trephine burs. The percentages of mineralized bone, marrow spaces, xenograft residual particles, connective tissue, vessels, and inflammatory infiltrate were evaluated. The total bone was calculated as sum of mineralized bone and marrow spaces. Mineralized bone was composed of newly formed bone (woven bone and parallel-fibered bone) and of lamellar bone, the latter mostly confined in the crestal region of the alveolar crest biopsies. At the alveolar crest sites, the percentage of mineralized bone was 40.1 ± 14.1%, of bone marrow was 40.1 ± 18.0%, and of the xenograft was 14.7 ± 15.2%. Small amounts of soft tissue were found. At the antrostomy sites, the percentages of mineralized bone, bone marrow, and xenograft were 26.0 ± 10.8%, 23.4 ± 17.0%, and 28.2 ± 15.7%, respectively. Soft tissue was represented by 19.7 ± 19.4%.

CONCLUSIONS

Higher percentages of mineralized bone and bone marrow were seen in the biopsies from the alveolar crest compared with those of the antrostomy. Particles of xenograft were still detectable in both biopsies, being about 15% at the crestal biopsies and about 28% at the antrostomy region. The higher content of biomaterial in the antrostomy region compared with the crestal region may be explained by the higher modeling and remodeling activities within the base of the sinus compared with the antrostomy region.

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