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Influence of the position of the antrostomy in sinus floor elevation assessed with cone-beam computed tomography: a randomized clinical trial

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ABSTRACT

In case of inadequate bone height in the posterior areas, a sinus floor elevation can be performed, so to increase bone volume and allow implant placement. In order to maintain the sinus mucosa elevated, the use of different biomaterials, or implants alone without grafting material has been proposed. As the preparation of the antrostomy will remove bone from the lateral wall of the sinus, the position and dimensions of the antrostomy might play an important role. The aim of the present study was to evaluate from a histological point of view the healing of mini-implants installed after sinus floor elevation using a lateral approach and placing the antrostomy at different levels from the sinus floor. Twenty-four healthy participants in need of sinus floor elevation for oral rehabilitation were recruited. The antrostomy was randomly placed either close to the base of the sinus floor (group base) or at about 3-4 mm cranially to it (group standard). A collagenated cortico-cancellous porcine bone (OsteoBiol® *Gen-Os*®, 250–1000 μm, Tecnoss®, Giaveno, Italy) was used to fill the elevated space subjacent to the elevated sinus mucosa and a collagen membrane (OsteoBiol® *Evolution* 0.3 mm, Tecnoss®) was placed to cover the antrostomy. Six months after, crestal incisions were performed and mini-implants were installed within the grafted region, through the alveolar crest. Three months later, biopsies were collected. At the histological analysis, the mini-implants were surrounded by new mineralized bone and marrow spaces. Some granules of the xenograft were in close contact with the implant surface without the interposition of soft or mineralized tissues. Other granules appeared to be separated by newly formed bone. The new bone reached fractions of 40.9±11.9% and 48.5±20.1% at the base and standard groups, respectively (p=0.208). Xenograft particles were found in contact with the implant surface at percentages of 12.1±11.0% in the base group, and 15.9±23.7% in the standard group (p=0.674).
All mini-implants presented a good integration into the newly formed bone in both groups. A trend of greater bone-to-implant contact and bone density was found at the mini-implants of the standard compared to the base group. However, the difference did not reach a statistical difference for both bone-to-implant contact (p=0.208) and bone density (p=0.623).

CONCLUSIONS

Due to the low number of samples, the Authors suggest that further studies with a higher number of participants should be performed, so as to support, with a statistically significant difference, the trend shown in the present study. Anyway, the reported results showed that the choice of one or the other position of antrostomy did not influence significantly the outcome and, therefore, should be left to the preference of the surgeon.

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