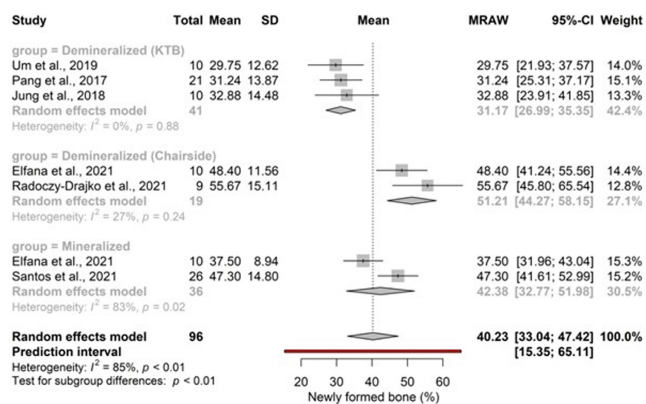**FIGURE 2**

FIGURE 3

Disclosure of Interest: None Declared

Keywords: Alveolar ridge preservation, Bone graft

EAO-647/OC-50 | **Biomimetic synthetic bone graft in alveolar ridge preservation: 1-year RCT results**

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Background: Synthetic bone grafts (SBG) represent an increasingly popular alternative to animal-derived materials. However, currently available SBGs have limited bioactivity due to high crystallinity, low porosity and low surface area. Recent developments including low-temperature processing resulted in a biomimetic SBG characterized by composition, morphology and crystallinity much closer to that of biological apatite.

Aim/Hypothesis: This prospective multicenter randomized controlled clinical trial aimed to compare the clinical outcomes with a novel biomimetic synthetic bone graft substitute to those with reference deproteinized bovine bone matrix (DBBM) in an alveolar ridge preservation procedure followed by implant placement.

Material and Methods: This clinical trial included patients in need of socket preservation and presenting a 4-wall alveolar defect in premolar and molar areas of either jaw. Following tooth extraction patients were randomized to grafting with the biomimetic SBG (creos syntogain, Nobel Biocare AB, Göteborg, Sweden, previously distributed as MimetikOss, Mimetis, Barcelona, Spain) or reference DBBM (BioOss, Geistlich, Wolhusen, Switzerland). Implants (NobelParallel CC, Nobel Biocare AB) were placed 6 months after the grafting procedure and loaded 6 months later. The primary endpoint was the vertical and horizontal dimensional change of the alveolar ridge from prior to grafting to 6 months postgrafting based on CBCT scans. Additional outcomes included histological analysis of bone samples collected at implant placement, evolution of implant stability quotient (ISQ), marginal bone levels at 4 and 12 months after implant placement, and oral health-related quality of life (QoL) based on the OHIP-14 questionnaire.

Results: In this study, 102 patients were randomized to receive bone augmentation using the biomimetic SBG or the reference DBBM. Six months postgrafting, the mean bone change in width and height was respectively −1.78% and 1.35% for the biomimetic SBG (n = 42) and −2.16% and 2.99% for the reference DBBM (n = 41). The differences between the two materials were not statistically significant. The mean implant insertion torque was 36.2 Ncm at sites regenerated with biomimetic SBG and 35.1 Ncm at sites regenerated with the reference DBBM. For the biomimetic SBG, 71.1% of the implants were placed with an insertion torque above 35 Ncm and 62.8% for the reference DBBM.

While no difference was observed in terms of bone quantity, sites augmented with the biomimetic SBG presented a lower percentage of stroma and contained more Multinucleated giant cells and/or osteoclasts (table). All sockets preserved with the biomimetic SBG supported implant placement with no biomaterial-related complications.

Conclusion and Clinical implications: Both biomaterials met the requirements for reliable alveolar ridge preservation in terms of biocompatibility, osseointegration, osteoconduction, and volume stability, as well as supported successful implant placement. Within the limitations of these interim results, the biomimetic synthetic bone graft demonstrated non-inferiority when compared to the reference DBBM in terms of dimensional preservation of the alveolar ridge.

TABLE 1

variable		biomimetic SBG n=42	reference DBBM n=41
Bone quantity changes based on CBCT	% change width	-1.78	-2.16
	% change height	1.35	2.99
Bone quantity changes based on histology	% Bone	36.5	31.7
	% Biomaterial	24.6	19.4
	% Stroma	38.9	48.8

EAO-644/OC-51 | Accuracy comparison of low-dose and standard-dose dental CBCTs in CAD/CAM guided implant surgery

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Background: CBCT data, digital implant treatment planning and the use of CAD/CAM technology in guided implant surgery have enabled safer and more efficient surgical approaches.
Nevertheless, CBCT examinations should only be performed when they provide additional diagnostic data that conventional two-dimensional imaging modalities using lower radiation doses cannot achieve.
Current studies emphasize that the use of low-dose CBCT provides sufficient image quality for implant planning and placement.
Aim/Hypothesis: This pre-clinical study's purpose aimed to evaluate low-dose CBCT protocols compared with standard CBCT protocols regarding geometric reliability in digital implant treatment planning and full-guided implant surgery
Material and Methods: Thirty mandibles of pig cadavers underwent both CBCT protocols on an Orthophos SL Unit (Dentsply-Sirona). Surface scans of the regions of interest were performed to create a digital diagnostic wax-up followed by 120 subsequent implant plannings (one implant per quadrant). Simple randomization (1:1) was assessed to assign each quadrant into one of the imaging protocols. Sixty implant surgical guides were manufactured using CAD/CAM technology, followed by the fully-guided placement of 60 implants following the surgical protocol in randomized order.
Geometric accuracy between the planned and definitive implant position was determined regarding apical distances between the central axes and angle deviation. Descriptive statistics and linear regressions were used for the statistical analysis of the data.
Results: Regarding implant apex deviation using low-dose CBCT, the following differences were observed: apical 0.75 ±0.63 mm and angular deviation 2.5 ±2.12°, while the standard dose CBCT showed the following results: apical 0.92 ±0.55 mm and angular deviation
3.06 ±2.12°. The regression analyses could not show evidence for a significant difference between the two CBCT protocols, neither with regard to the apical distance nor in view of the angular deviation.
Conclusion and Clinical implications: Low-dose CBCT imaging protocols providing accurate three-dimensional anatomical information with an improved benefit-risk ratio according to the ALADA principle could become a promising option as a primary diagnostic modality as well as for radiological follow-up.