RESEARCH REPORTS
Clinical

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Serum Bone Biomarkers and Oral/Systemic Bone Loss in Humans

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APPENDIX

Supplementary Methodological Information Regarding Acquisition of Bite-wing Radiographs and Quality Control

All radiographs at each center were developed with a designated film processor. The same x-ray unit (Quint-Sectograph, Los Angeles, CA, USA) was used at each center. The angle of the midsagittal plane of the patient's head in relation to the tube head was consistent for each individual at 18 degrees. Vertical and horizontal positions of the head were noted for each participant at baseline and reproduced for the one- and two-year radiographs.

All radiographs were reviewed by the central examiner for errors in processing, exposure, and projection geometry. Among the 1432 radiographs taken, 60 (4%) had errors that required a retake. Patients were recalled, and radiographs were taken a second time without error. In addition, any alveolar bone density or height measure that resulted in a calculated change from baseline below the 5th or above the 95th percentile of the observed change distribution was reviewed. Replicate measures were made on a random 10% sample of participants where patient identification codes were masked. The standard deviation of replicate measures for CADIA was estimated to be 7.8 units and 0.2 mm for alveolar bone height.

Statistical Modeling Supplementary Information

Choice of Serum Biomarker Categories

One-year and two-year changes in serum biomarker measures from baseline were modeled as categorical variables, where the categories were defined based on the observed tertiles of the distribution of the change values (tertiles of lowest, intermediate, and highest). Tertiles were chosen over quartiles to ensure an adequate number of participants in each biomarker group demonstrating bone changes.

Explanation of Why Only Two-year Changes are Reported

The association between changes in osteocalcin and CADIA and the association between changes in ICTP and alveolar bone height differed, depending on time-point ($p = 0.027$ and $p = 0.0031$, respectively), whereby associations were evident long-term (2 yrs), but not at the one-year time-point. There was no significant modification by time-point found for any other biomarker or bone measure. When no interaction was found, results of analyses with one- and two-year measures aggregated were similar to the stratified analysis results for the two-year changes. Therefore, for ease of interpretation and consistency of reporting across the biomarkers and bone measures, only two-year changes are reported.