

Figure 3: In vivo experimental model shows condyle response to dynamic loading. A low-magnitude, high-frequency dynamic load (120 Hz, 0.3 peak resultant acceleration, 20 μm displacement and 30 $\mu\epsilon$) was applied to the lower right molars for 5 minutes per day, for different time periods. (A) Schematic shows the location of the strain gauge and accelerometer that allowed the evaluation of micro-strain and acceleration on the alveolar bone. (B) Region of Interest (ROI) where the condylar bone quantity and quality were evaluated was limited inferiorly by a plane passing through the apex of the superior mandibular notch and inferior mandibular notch (Plane A) and superiorly by a plane parallel to the inferior plane passing through the apex of the condyle (Plane B). From the mesial and distal side, a plane perpendicular to the inferior plane and tangent to the mesial and distal surfaces of the condyle define the limits of the ROI. (C) Bone parameters were measured in a rectangular area (inside purple rectangle) of approximately 4.3 x 1.5 mm. (D) 3-D reconstructed μCT images of the condylar process of Dynamic Load or Static Load groups collected at 28 days. Note the marked increase in bone density in the Dynamic load group. (E) Fluorescence microscopy images of frontal sections of the condylar process after 28 days of dynamic or static load application. Animals received calcein green (15 mg/kg, i.p.) injections on days 0 and 25 and were euthanized on day 28. Note the significant increase of the osteogenic activity shown as increased fluorescence in Dynamic Load group.

