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Proximal alveolar bone level after orthodontic treatment with magnets, superelastic coils and straight-wire appliances

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ABSTRACT

Proximal alveolar bone level changes were radiographically determined in 20 subjects (mean age 14.3 years, SD 2.00) a short time after rapid orthodontic treatment with magnets and superelastic nickel-titanium coils succeeded by straight-wire appliances. The findings were compared with a matched control group of 20 individuals (mean age 14.3 years, SD 1.99) who had no history of orthodontic treatment. Proximal alveolar bone level changes were determined on bitewing radiographs as the distance between the cemento-enamel junction (CEJ) and the alveolar bone crest (AC). The observation period was 2.7 years (SD 0.65) for the treatment group and 2.8 years (SD 0.65) for the control group. In the treatment group, a small mean increase of 0.2 mm (SD 0.29) in the CEJ-AC distance was found a short time after treatment. In the control group the increase in CEJ-AC distance was 0.1 mm. The difference between the groups was significant ($P < 0.001$). In the treatment group, sites in the maxilla showed significantly greater CEJ-AC distances than in the mandible ($P < 0.001$), 0.3 mm (SD 0.33) versus 0.1 mm (SD 0.24). The mesial sites of the maxillary first molars in the treatment group showed the highest average increase in distance between CEJ and AC, mean 0.5 mm (SD 0.33). Neither group had any sites with bone loss, i.e., CEJ-AC distance exceeding 2 mm. No significant difference was found in CEJ-AC distance between teeth moved with magnets succeeded by straight-wire appliances and teeth moved with superelastic coils succeeded by straight-wire appliances.

KEY WORDS: Alveolar bone level, Magnets, Orthodontic appliance, Radiography, Superelastic coils.

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