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Original Articles

Forces and Moments Generated with Various Incisor Intrusion Systems on Maxillary and Mandibular Anterior Teeth

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Abstract

Objective: To evaluate the comparative intrusive forces and torquing moments in the sagittal plane generated during anterior intrusion using different incisor intrusion mechanics in the maxillary and mandibular anterior teeth.

Materials and Methods: Five wire specimens were used for each of the following intrusive arches: non-heat-treated, 0.016 × 0.016-inch blue Elgiloy utility arch, 0.017 × 0.025-inch TMA utility arch, and 0.017 × 0.025-inch TMA Burstone intrusion arch. The wires were constructed according to the specifications given by their inventors and were inserted on bracketed dental arches on Frasaco models, segmented mesial to the canines. Simulated intrusion from 0.0–1.5 mm was performed on the Orthodontic Measurement and Simulation System (OMSS), and forces and moments were recorded at 0.1 mm vertical displacement increments. All measurements were repeated five times for each specimen, and maximum values recorded at 1.5 mm for all wires were used for all statistical evaluations. The data were analyzed with two-way analysis of variance (ANOVA) with forces and moments serving as the dependent variables, separately, and wire type and jaw as the independent variables. Post hoc multiple comparisons were performed using the Tukey test (.05 error rate).

Results: The 0.017 × 0.025-inch TMA Burstone intrusion arch exerted the lowest intrusive forces, followed by the 0.017 × 0.025-inch TMA utility and the 0.016 × 0.016-inch blue Elgiloy utility arch. The lowest anterior moment in the sagittal plane in this experiment was generated from the 0.017 × 0.025-inch TMA Burstone intrusion arch.

Conclusions: The intrusive forces, as well as the generated moments, were always higher in the mandible, where significant differences were observed among the configurations tested.

Keywords: [Intrusion](#), [Burstone arch](#), [Utility](#), [TMA](#), [Moments](#)

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