

عنوان مقاله:

Arch dimensional changes following orthodontic treatment with extraction of four first premolars

محل انتشار:

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خلاصه مقاله:

BACKGROUND AND AIM: Tooth extraction as a part of orthodontic treatment plan to create space for leveling and aligning teeth or causing tooth movement leads to changes in arch width and length. The outcome of these changes is important for the clinicians and affects the treatment and retention plans. Despite some previous studies, data in this regard are still scarce and further investigation is required on this subject. The purpose of this study was to evaluate dental arch dimensional changes following four first premolars extraction orthodontic treatment. **MATERIALS AND METHODS:** In this study, 100 pairs of dental casts and respective patient records that fulfilled the inclusion criteria were randomly selected from the archives of the Department of Orthodontics, School of Dentistry in Shahid Beheshti University of Medical Sciences, Tehran, Iran. Length and width of dental arch were measured on the initial and final casts of patients using a digital caliper with 0.1 mm precision. The mean, standard deviation (SD) and standard error of variables were determined, and the data were analyzed using SPSS software. Paired t-test was applied to compare changes before and after treatment. **RESULTS:** The obtained results showed that the maxillary and mandibular inter-canine widths significantly increased as the result of fixed appliance therapy with the extraction of four first premolars. The arch width at the second premolar and molar at mesiobuccal cusp tip and distobuccal cusp tip regions in the maxilla and mandible showed a significant reduction ($P < 0.001$). In this study, arch length at different points was measured. In the maxilla, the incisor-canine distance in both quadrants experienced a significant increase ($P < 0.001$). Furthermore, the canine-molar distance and the incisor-molar distance in both quadrants and the total arch length showed a significant reduction ($P < 0.001$). In the mandible, the incisor-canine distance in the right quadrant significantly increased ($P < 0.05$), but the reduction in the incisor-canine distance in the left quadrant was not statistically significant. Moreover, the canine-molar and the incisor-molar distance in both quadrants and the total arch length all decreased significantly ($P < 0.001$). **CONCLUSION:** Orthodontic treatment with extraction of four first premolars significantly increased the inter-canine width and incisor-canine distance in both jaws; but, the inter-premolar and inter-molar widths, canine-molar distance, incisor-molar distance, and total arch length significantly decreased.

کلمات کلیدی:

Dental Arch Length, Dental Arch Width, Extraction Orthodontic Treatment

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