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Original Articles

Prediction of Lip Response to Four First Premolar Extractions in White Female Adolescents and Adults

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Abstract

Objective: To develop models for predicting changes in lip position of Class I extraction patients.

Materials and Methods: Pretreatment and posttreatment lateral cephalograms of 46 white female adults and 109 white female adolescents were examined. Mean pretreatment ages for the adolescent and adult groups were 12.2 ± 1.2 years and 23.0 ± 8.5 years, respectively. Subjects were treated with conventional edgewise mechanics. Multivariate prediction models were derived from a randomly selected sample of 119 subjects and validated on the remaining 36 subjects.

Results: Adolescents demonstrated significant vertical and horizontal skeletal growth and treatment changes, while adults showed only small increases in anterior face height. While significant retraction of the upper and lower incisors occurred in both groups, the amounts were greater in adults than in adolescents. Ratios for horizontal hard tissue to soft tissue movements ranged from 1.4:1 to 1.1:1 and 1.3:1 to 1:1 for the upper (Ls) and lower (Li) lips, respectively. There were moderate relationships between horizontal lip and underlying hard tissue movements (correlations ranged from .57 to .78 for Ls and from .58 to .86 for Li). Multiple regressions to predict lip movements showed moderately strong relationships for the upper lip ($R = .79$ to $.81$) and strong relationships for the lower lip ($R = .89$ to $.90$). Two to three variables were necessary to predict vertical lip movements ($R = .82$ to $.87$). The validation sample showed no systematic biases and similar levels of accuracy.

Conclusions: Upper and lower lip retraction in four first premolar extraction cases can be predicted with moderately high levels of accuracy in white female adolescents and adults.

Keywords: [Soft tissues](#), [Prediction](#), [Cephalometrics](#), [Treatment changes](#), [Adolescents](#), [Adults](#)

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