HANDS ON

OCCLUSION

Posterior space discrepancy theory

BACKGROUND

The causes of open-bite malocclusion are multiple and include the interaction of environmental, genetic, skeletal, and dentoalveolar factors. Some authors have associated posterior space discrepancy with anterior open-bite malocclusion. The mechanism proposed is that patients with open bite may have a posterior space discrepancy that promotes the mesial angulation of the posterior teeth. The result is overeruption of the third molars, which interferes with occlusion, aggravating an open-bite malocclusion. Other studies suggest that these effects are not caused by posterior space discrepancy. A study was undertaken to objectively evaluate the effect of maxillary and mandibular posterior space discrepancies and third molar angulations on overbite and dental angulation and height of posterior teeth and incisors in patients with open bites and deep bites.

METHODS

Of the 131 subjects studied, 83 had open bite and 48 had deep bite. The influence of maxillary and mandibular posterior space discrepancies and third molar angulations on overbite was evaluated. Correlations between posterior space discrepancy and third molar angulation, as well as those between predictor variables and dental angulation and height of posterior overbite and deep bite were compared using *t* tests.

RESULTS

The only variable that had a significant effect on overbite was mandibular third molar angulation. The mesial angulation of the mandibular third molar showed a positive but weak correlation with the overbite. No significant effect was related to any of the other predictor variables.

Third molar available space and maxillary third molar distal angulation and mandibular third molar mesial angulation were found to be significantly but weakly associated, respectively. The degree of maxillary third molar available space was both significantly and positively associated with increased incisor labial inclination, second premolar, first and second molar mesial angulations, and first and second molar dentoalveolar heights. A negative association was found between third molar angulation and first and second molar mesial angulation and height, as well as second premolar height. The correlations were weak.

Significant positive associations were found between the amount of mandibular third molar available space and increased incisor and posterior teeth dentoalveolar heights. A positive association was noted between the third molar angulation and the second premolar and first and second molar mesial angulations. Negative associations were noted with the incisor and posterior teeth heights, except for the second molar. Again, correlations were weak.

When accentuated negative overbite and deep bite were compared with respect to skeletal vertical variables and overbite, significant differences were found. Patients with deep bite had significantly greater mesial angulations of the mandibular third molar than patients with open bite.

DISCUSSION

The treatment of overbite is geared toward eliminating the causative factors to achieve efficiency and ensure stability of the orthodontic treatment. Usually the goal is to upright and vertically control or intrude the posterior teeth. This investigation showed that third molar mesial angulations and deficient available space for their eruption do not aggravate open bite. The extraction of third molars should be based on factors other than preventing any increased open bite.

Clinical Significance

No clinically significant effect on overbite or the angulation and height of posterior teeth and incisors was found for posterior space discrepancies and third molar angulation. Patients with deep bite had greater mesial angulation of the mandibular third molars than patients with extreme open bites. These facts do not support the maxillary and mandibular posterior space discrepancy theory on the overbite, posterior teeth angulation, and dentoalveolar height.

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