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Assessment of Mandibular Posterior Available Space in Skeletal Class I and Class III Malocclusion Patients

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Abstract

Objectives: This study aimed to compare the mandibular posterior available space between patients with skeletal Class I and skeletal Class III malocclusion.

Methods: The retrospectively analyzed cone-beam computed tomography (CBCT) scans from 60 Thai orthodontic patients with normodivergent patterns. Patients were allocated to skeletal Class I or Class III; Class III severity was stratified by Wits appraisal. Mandibular posterior available space (MPAS) was measured on axial slice of CBCTs at the crown level and at root levels 3, 6 and 9 mm (RL₃, RL₆ and RL₉) apical to the cemento-enamel junction. Comparisons of the mandibular posterior available space between skeletal Class I and Class III groups were performed using the Mann-Whitney U test. The value of $p < 0.05$ was considered statistically significant for differences.

Results: No statistically significant differences in MPAS were detected between the skeletal Class I and Class III groups. Within the Class III group, MPAS did not differ significantly between non-severe and severe subgroups. Regarding mandibular third-molar status, Class III subjects with a mandibular third molar exhibited significantly greater MPAS at RL₆ and RL₉ compared with those without a third molar. In the Class I group, MPAS values did not differ significantly between the third-molar and non-third-molar subgroups.

Conclusions: The MPAS did not differ significantly between skeletal Class I and Class III patients. Clinically, these findings highlight the importance of individualized, CBCT-based evaluation rather than reliance on generalized characteristics such as skeletal classification.

Keywords: cone-beam computed tomography, mandibular posterior available space, orthodontics, retromolar space