

Mesially Impacted Mandibular Second Molars and Adjacent First Molars: A Study of Occlusal Inclination and Root Curvature Via Panoramic Radiographs

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Abstract

There is very little available information on the root characteristics of mesially impacted mandibular second molars (7M). This study investigates occlusal inclination, root curvatures and calcification stage of unilateral 7M versus their normal counterparts (7N). Inclination and curvature of the mandibular first molars on the affected (6M) and control side (6N) were also assessed. Fifty-one digital panoramic radiographic images from study participants with unilateral 7M were examined with image J software. Occlusal inclination and degrees of root curvature at middle third and apical third level of mesial and distal root of 7M, 7N, 6M, 6N were measured and compared. Association between 7M occlusal inclination and degree of root curvature was tested. Calcification stage of 7M and 7N was evaluated by Demirjian Index. There were significant differences of occlusal inclination between 7M and 7N ($P<0.01$), and between 6M and 6N ($P<0.01$). In 7M, apical third of mesial root tended to curve mesially ($P<0.01$), whereas in 6M, apical third of both roots tended to curve distally ($P<0.01$) but the middle third of distal root tended to curve mesially ($P<0.05$). No association between the degree of root curvature and occlusal inclination was found for 7M. About one-quarter of 7M had delayed calcification compared to 7N. In conclusion, there were differences in root curvature between 7M and 7N, and 6M and 6N. 6M tended to be more upright than 6N. The degrees of root curvature and occlusal inclination of 7M were not related.

Keywords: Impaction, Mandibular second molars, Mandibular first molars, Occlusal inclination, Root curvature, Root development

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