

The European Journal of Orthodontics, Volume 18, Issue 3: June 1996.

The effect of a transpalatal arch for the correction of first molar rotation

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ABSTRACT

The effects of a transpalatal arch for the symmetrical derotation of rotated first molars were evaluated in 50 children, 8-13 years of age. The positions of the molars were compared with those in 34 individuals, aged 12-18 years, with normal occlusion. Prefabricated (GAC) stainless steel arches were used for 60-198 days (median time 122 days). The effect was recorded with a measuring microscope on dental casts from before and after the treatment. Molar positions were determined from the tips of the four cusps of the tooth in relation to a coordinate system based on palatal reference points. The centre of rotation of the molars during derotation were calculated from the movement of their cusps. Before derotation the first molars were significantly mesiopalatally rotated compared with the normal occlusion group. The derotation overcompensated the initial rotation. In about two-thirds of the cases the mesiobuccal cusp of the molar moved distally during the derotation. In the remaining cases it moved mesially or remained unchanged. The median distal movement was 0.3 mm on the right and 0.5 mm on the left side. Because many molars moved mesially, on average there was no gain in space in the dental arch from the derotation. The location of the centre of derotation varied widely but it was on average located midway between the distobuccal and distopalatal cusps. In most cases the derotation resulted in a small, unintended, expansion. The study showed that mesiopalatally rotated first molars can effectively be derotated with a transpalatal arch. The effect on the mesiodistal position of the mesiobuccal cusp, and particularly with regard to space gain, is, however, unpredictable.

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Last modification: 6 November 1997.

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