

OP11 SECOND PREMOLAR AGENESIS IS ASSOCIATED WITH MANDIBULAR FORM: A GEOMETRIC MORPHOMETRIC ANALYSIS OF MANDIBULAR CROSS-SECTIONS

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AIM: To compare mandibular form (i.e., size and shape) between patients with agenesis of the lower second premolar (P2) and a control group without agenesis. Three hypotheses were tested: (H1) agenesis causes a change in mandibular morphology because of inadequate alveolar ridge development in the area of the missing tooth (mandibular plasticity); (H2) agenesis is caused by spatial limitations within the mandible (dental plasticity); and (H3) common genetic/epigenetic factors cause agenesis and affect mandibular form (pleiotropy).

MATERIALS AND METHOD: A geometric morphometric analysis was applied to cross-sectional images of computed tomography (CT) scans of three matched groups (n = 50 each): (1) regularly erupted P2; (2) agenesis of P2 and the primary second molar *in situ*; and (3) agenesis of P2 and the primary second molar missing for >3 months. Cross-sections of the three areas of interest (first premolar, P2, first molar) were digitized with 23 landmarks and superimposed by a generalized Procrustes analysis.

RESULTS: On average, the mandibular cross-sections were narrower and shorter in patients with P2 agenesis compared with that in the control group. Both agenesis groups featured a pronounced submandibular fossa. These differences extended at least one tooth beyond the agenesis-affected region. Taken together with the large interindividual variation that resulted in massively overlapping group distributions, these findings support genetic and/or epigenetic pleiotropy (H3) as the most likely origin of the observed covariation between mandibular form and odontogenesis.

CONCLUSIONS: Clinically, reduced dimensions and greater variability of mandibular form, as well as a pronounced submandibular fossa, should be expected during treatment planning of patients with P2 agenesis.