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Maxillary Lateral Incisor Agenesis and Anterior Bolton Tooth Size Discrepancy

L. David, G. S. Antonarakis
UNIGE, Genève, Switzerland

Objectives To determine whether cases with congenitally missing maxillary lateral incisor (uni- or bi-lateral) present with anterior Bolton tooth size discrepancies when space closure is carried out.

Methods This was a cross-sectional case control study in which anterior Bolton tooth size discrepancies between patients with maxillary lateral incisor agenesis and those without dental anomalies was evaluated. All patients from the archives of an orthodontic clinic were searched to find patients that complied with the following inclusion criteria: isolated maxillary lateral incisor agenesis (without other dental anomalies); panoramic radiographs available; dental casts available with all anterior teeth including permanent canines erupted. From the 3'876 patients screened, 41 cases were selected based on inclusion criteria. A random sample of 41 control patients without dental anomalies were subsequently selected for comparison. Anterior Bolton tooth size discrepancy analyses were performed for all patients under the following assumptions: 1) simulated unilateral space closure with mesialisation of the canine and first premolar (for unilateral agenesis cases); 2) simulated bilateral space closure with mesialised of both canines and first premolars (for uni- and bi-lateral agenesis cases). Independent sample t-tests were undertaken to compare discrepancies between agenesis and control patients.

Results From the 41 total agenesis patients included, 19 presented with unilateral and 22 with bilateral agenesis. Simulated unilateral space closure resulted in a Bolton mandibular excess of 0.9mm, while simulated bilateral space closure in a mandibular excess of 0.8mm in unilateral agenesis cases and no excess in bilateral agenesis cases. These discrepancies were statistically significant ($p < 0.05$) for the unilateral agenesis group.

Conclusions When performing space closure in maxillary lateral incisor agenesis cases, one may finish treatment with an anterior Bolton mandibular excess in unilateral agenesis cases, both when closing the space unilaterally, or when deciding to extract the contralateral tooth and close spaces bilaterally.