Panoramic radiograph to measure gonial angle- To rely or not to rely?

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Commentary:

The gonial angle is routinely used in orthodontics, in deciding treatment plan and prediction of growth rotation of the mandible. High angle cases show increased gonial angle with a downward and backward rotation of mandible whereas in low angle cases shows decreased gonial angle with forward and upward rotation of mandible¹. To measure gonial angle lateral cephalogram is most commonly used in orthodontics. However, the gonial angle determination on lateral cephalogram is unpredictable due to the superimposition of images of bilateral structures³. Previous studies showed that a panoramic radiograph can be used for determining the gonial angle more accurately than lateral cephalogram⁴; while other studies stated that there was great variation in values of the gonial angle of the orthopantomogram because of magnification and distortion. So we decided to use stable infrabony structure i.e. mandibular canal on orthopantomogram for measurement of gonial angle. Hence the study aimed to compare the gonial angle using the mandibular canal on orthopantomogram with the gonial angle on lateral cephalogram using 3 different planes Tweed, Downs, Steiner. For this study orthopantomogram and lateral cephalogram of 100 patients were selected. The study consisted of 4 parameters, gonial angle on orthopantomogram and gonial angle on lateral cephalogram defined by Tweed, Downs, and Steiner. The selected radiographs were traced by a single operator. The hard tissue landmark gonion, menton, gnathion were traced on lateral cephalogram. The ramal plane and mandibular plane defined by Tweed, Downs, and Steiner were drawn and the gonial angle was measured respectively. On orthopantomogram, hard tissue landmark condylion, menton, and infrabony landmark on the mandibular canal were traced and the gonial angle measured using corpus line and condylar plane⁵. The stable infrabony landmark is the perpendicular distance to the lower border of the mandibular canal from the intersection of upper and lower tangent⁵. Values of the gonial angle of orthopantomogram compared with values of gonial angle on lateral cephalogram. To check the statistical significance repeated measure ANOVA test was used, for multiple comparisons between two individual groups post hoc Bonferroni test was used. Statistical analysis showed there is a statistically significant difference between all 4 parameters. The present study showed that the gonial angle using stable infrabony landmarks is not a reliable alternative for the measurement of the gonial angle.

References

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