Geometric morphometric shape assessment of juvenile mandibles

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OBJECTIVES: We explore three-dimensional data to delineate idiosyncratic and progressive growth variation in 6.0-8.0 year old mandibles (n=45).

METHODS: Thirty-nine landmarks were digitized. Using Morphologika we assessed shape using Principle Components (PC) Analysis on Procrustes-aligned shape variables.

RESULTS: PC 1-4 explain 18.5, 12.0, 9.6, and 8.0% of the variance, respectively. PC1 becomes positive between 6.0-6.5 years, stabilizing after 7.0 years. This shows that the corpus-to-ramus angle becomes more obtuse between 6-7.0 years. Dimensions comprising PC1 stabilize but idiosyncratic variation increases between 7-8.0 years. PC2 shows little intergroup growth but a significant change in idiosyncratic variation related to corpus width. PC3 shows substantial lateral coronoid process growth and concomitant anterior chin progression related to idiosyncratic variation but little in the way of progressive age change.

CONCLUSIONS: Geometric morphometric methods allows visualization of the range of idiosyncratic variation in specific age groups but also the type and degree of shape change between minor increments of age.