Estimating age in young adults using shape changes in the third cervical vertebra

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ABSTRACT

Estimating chronological age in young adults is difficult and additional methods are required. This study explored a new method to assess the third cervical vertebra maturation and compared the results with the maturation of the second and third mandibular molars (M2 and M3) in order to assess the chronological age of 18. The sample was radiographs of 174 dental patients (78 males, 96 females aged 15-22 years). A semi-automated method was developed to analyse shape changes of the third cervical vertebra (C3). Eight variables were compared in two age categories: younger than 18 and at least 18 years of age in males and females separately using a t-test. Tooth formation of M2 and M3 was assessed. Mean values of eight variables in boys and one variable in girls were significantly different between the two age categories ($p<0.05$). Results for boys showed that the best age indicator for age ≥18 is the ratio between height and width of C3 and the ratio between diagonals. Results for molars showed that M2 was mature in many cases and M3 was highly variable or missing. We conclude that shape change of C3 has potential as an additional method to estimate age in young adults.