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Method for quantifying facial asymmetry in three dimensions using stereophotogrammetry

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ABSTRACT

A three-dimensional method to quantify facial asymmetry is introduced. Stereophotogrammetry was applied to determine three-dimensional (3-D) coordinates for eight pairs of surface landmarks of 106 individuals, including 16 with an operated complete unilateral cleft lip and palate. Facial asymmetry was quantified from four different reference planes that were defined perpendicular to and bisecting lines between pairs of bilateral landmarks related to the eyes, nose and mouth. Significant differences ($P < 0.01$) between these four planes were determined using multivariate analyses of variance (MANOVA). It is concluded that the best reference plane to select in studies of facial asymmetry is formed by the one which is perpendicular to and bisects the line that connects the landmarks Exocanthion. Reproducibility and validity of the method is demonstrated.

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