Helmet Versus Active Repositioning for Plagiocephaly: A Three-Dimensional Analysis - DTU Orbit (01/01/2019)

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BACKGROUND AND PURPOSE: Orthotic helmets and active repositioning are the most common treatments for deformational plagiocephaly (DP). Existing evidence is not sufficient to objectively inform decisions between these options. A three-dimensional (3D), whole-head asymmetry analysis was used to rigorously compare outcomes of these 2 treatment methods. PATIENTS AND METHODS: Whole-head 3D surface scans of 70 infants with DP were captured before and after treatment by using stereophotogrammetric imaging technology. Helmeted (n = 35) and nonhelmeted/actively repositioned (n = 35) infants were matched for severity of initial deformity. Surfaces were spatially registered to a symmetric template, which was deformed to achieve detailed right-to-left point correspondence for every point on the head surface. A ratio-metric asymmetry value was calculated for each point relative to its contralateral counterpart. Maximum and mean asymmetry values were determined. Change in mean and maximum asymmetry with treatment was the basis for group comparison. RESULTS: The helmeted group had a larger reduction than the repositioned group in both maximum (4.0% vs 2.5%; P = .02) and mean asymmetry (0.9% vs 0.5%; P = .02). The greatest difference was localized to the occipital region. CONCLUSIONS: Whole-head 3D asymmetry analysis is capable of rigorously quantifying the relative efficacy of the 2 common treatments of DP. Orthotic helmets provide statistically superior improvement in head symmetry compared with active repositioning immediately after therapy. Additional studies are needed to (1) establish the clinical significance of these quantitative differences in outcome, (2) define what constitutes pathologic head asymmetry, and (3) determine whether superiority of orthotic treatment lasts as the child matures. Pediatrics 2010;126:e936-e945

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