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Computational algorithm for gait analysis of acetabular dysplasia

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Acetabular dysplasia associated with Developmental Dysplasia of the Hip (DDH) is an orthopedic disease featuring instability of the hip joint due to shallow acetabulum. V... **View more**

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Abstract:
Acetabular dysplasia associated with Developmental Dysplasia of the Hip (DDH) is an orthopedic disease featuring instability of the hip joint due to shallow acetabulum. Various reduction techniques have been adopted in the clinical field to treat DDH patients. However, the postoperative state of recovery for children and adolescent patients is lacking in the literature. This study aimed to investigate gait deviations between treated DDH patients and healthy controls within 8 to 18 years old through gait analysis by developing and using computational algorithms. An Inertial Motion Capture (IMC) system known as Xsens MVN was used in the gait experiments. Temporospatial and kinematic parameters were computed using a customized algorithms which were fed in the inertial sensor data. Statistical analysis using independent samples t-test was performed in SPSS software. The results demonstrated significantly lower gait speed, larger maximum hip adduction angle and larger maximum hip internal rotation angle in the treated DDH patient group with p-values less than 0.05.

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