

## Anterior Inferior Iliac Spine Morphology Correlates with Hip Range of Motion: A CT-based Classification System and Dynamic Hip Model

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### Summary:

The AIIS can be reproducibly classified into 3 morphological types (i.e. I, II, III) based on 3D CT reconstructions. When hips in patients with signs of FAI are matched for version and alpha angle, AIIS types II and III are associated with decrease in hip flexion and internal rotation, supporting the rationale to consider AIIS decompression for types that extends to and below the acetabular rim.

### Abstract:

#### Purpose:

The anterior inferior iliac spine (AIIS) contributes to hip dysfunction in patients with symptomatic impingement and resection of a prominent AIIS can reportedly improve function. However, the variability of the AIIS morphology and whether that variability correlates with risk of associated symptomatic impingement are unclear. The purpose of this study was to characterize AIIS morphology in patients with hip impingement and to test the association between specific AIIS variants and hip range of motion.

#### Methods:

We evaluated three-dimensional CT reconstructions of 53 hips (53 patients) with impingement and defined three morphological AIIS variants: Type I when there was a smooth ilium wall between the AIIS and the acetabular rim, Type II when the AIIS extended to the level of the rim, and Type III when the AIIS extended distally to the acetabular rim. A separate cohort of 78 hips (78 patients) with impingement was used to compare hip range of motion among the three AIIS types.

#### Results:

Mean hip flexion was limited to 120°, 107°, and 93° in hips with Type I, Type II, and Type III AIIS, respectively ( $p < 0.01$ ). Mean internal rotation was limited to 21°, 11°, and 8° in hips with Type I, Type II, and Type III AIIS, respectively ( $p < 0.01$ ).

#### Conclusions:

When the AIIS is classified into three variants based on the relationship between the AIIS and the acetabular rim in patients with impingement, Type II and III variants are associated with decrease in hip flexion and internal rotation, supporting the rationale for considering AIIS decompression for variants that extend to and below the rim.