Summary: This study describes the normal values of AIIS dimensions, distances from anterior acetabular rim and version. Morphologic variations that deviate from these normal values may help the clinician identify cases of subspinal impingement as a result of hypertrophy or distal protrusion of the AIIS.

Purpose: Excessive distal or anterior extension of the Anterior Inferior Iliac Spine (AIIS) can result in impingement against the femoral neck. The aim of this study was to describe the size, location and position of AIIS.

Methods: Fifty computerized tomography (CT) scans of fifty patients were reviewed. All scans were used in order to measure both left and right AIIS for the anatomic description of 100 AIISs. AIIS dimensions, specifically the length, width and height were measured. Vertical, horizontal and straight distance between the most antero-inferior prominence of the AIIS and the acetabular rim were also measured. The version of the AIIS was also assessed using two angles. The first angle was measured as the angle between the AIIS mid axis line and Plumb line while the second angle was calculated as the angle subtended by the AIIS mid axis line and ilium mid axis line.

Results: Fifty CT scans of fifty different patients with mean age of 29.9 years (range 21-40) were reviewed. There were 25 males with a mean age of 29.6 years (range 21-40) and 25 females with mean age of 30.2 years (range 21-40). These ages were not significantly different between the two gender groups (p=0.682). In males, mean length of AIIS was 31.5mm (range 23-39.5mm), mean AIIS height was 6.4mm (range 3.5-10mm), mean AIIS width was 11.9mm (range 8.5-16.1mm), mean vertical distance between AIIS and acetabular rim was 13.5mm (range 4.6-21.4mm), mean straight distance between those two points was 21.8mm (range 10.4-32.3mm), mean angle between AIIS and a plumb line was 9.2° laterally (range 0-30°) and mean angle between AIIS and iliac axis was 16.9° medially (range -23°-32°). In females, mean length of AIIS was 27.2mm (range 18.7-34mm), mean AIIS height was 5.7mm (range 2.1-9.8mm), mean AIIS width was 9.7mm (range 6.6-13.5mm), mean vertical distance between AIIS and acetabular rim was 11.4mm (range 6-17.3mm), mean straight distance between those two point was 18.6mm (range 11-28mm), mean angle between AIIS and a plumb line was 8.1° laterally (range -5°-37°) and mean angle between AIIS and iliac axis was 18.6° medially (range 4°-34°).

There was a significant difference between male and female in all measurements except the height and both angles. No significant differences were found in AIIS measurements between the left and right sides for the entire study population (p value ranges from 0.08-0.86). No significant differences in AIIS measurements between the left side and the right side were found when analyzing the data for males (p value ranges from 0.06-0.89) and for females (p value ranges from 0.07-0.90).

Conclusion/summary: This study is the first study reporting normal values of AIIS dimensions, distances from anterior acetabular rim and version. Morphologic variations that deviate from these normal values may help the clinician identify cases of subspinal impingement as a result of hypertrophy or distal protrusion of the AIIS.