Hip Arthroplasty and Computed Tomography of Abdomen: A Retroperitoneal Indicator of Post Arthroplasty Hip Flexor impingement

**Background:** To evaluate if a tangible association exists between the psoas muscle (PM) atrophy with ipsilateral acetabular component version.

**Methods:** 190 CT scans of abdomen/pelvis in patients with a history of unilateral total hip arthroplasty (THA) were meticulously reviewed, culminating in a total of 50 patients meeting inclusion and exclusion requirements. The exclusion criteria subsumed a history of iliopsoas tenotomy, prior PM hematoma or lumbar spine surgery. The maximum anterior-posterior length of uncovered acetabular component (UAC) was measured on sagittal reformats (Figure 1). The acetabular version angle was measured on both axial (AAV) and sagittal (SAV) reformats (Figure 2 & 3). The percentage difference between ipsilateral and contralateral PM in terms of quantitative radiodensity in Hounsfield unit (DHU) and cross-sectional area measurement (AM) in cm² was assessed (Figure 4). The UAC, AAV and SAV were measured blindly to DHU and AM and the ensuing data was compiled and computed. Additional analysis was then performed by dividing patients into two groups; Group A patients had DHU values over 50% and Group B patients had DHU values less than 50%. UAC, AAV, SAV were compared between groups A and B.

**Results:** Findings revealed substantial positive correlation between DHU and UAC ($r^2=0.8$, $P<0.001$). A significant negative correlation was demonstrated between AAV, SAV and DHU ($r^2=-0.4$, $P<0.005$) and a significant positive correlation between UAC and AM ($r^2=0.5$, $P<0.001$). No significant negative correlation between AAV, SAV and AM ($r^2=-0.1$, $P>0.005$) was indentified. Group A and B included 14 and 34 patients respectively. Group A was found to have an increased UAC (8mm ±4, $P<0.001$), decreased SAV (22° ±10, $P<0.01$) and decreased ASV (24°±11, $P<0.0$) compared to Group B (0.08mm±0.5, 32°±11, 34°±10).

**Conclusion:** There is a strong association between ipsilateral psoas muscle atrophy in patients with THR who have an increased length of the uncovered acetabular component and decreased acetebular version angle.

**Clinical relevance:** Dedicated CT Hip protocol to include the lower abdomen may confer additional value when evaluating suspected iliopsoas impingement/rupture in patients with THR.
Figure 1: UAC, Uncovered acetabular component.

Figure 2: AAV, Axial acetabular version angle.

Figure 3: SAV, Sagittal acetabular version angle.

Figure 4: Difference in density (DHU) and cross sectional area (AM) between Psoas muscles.