Native Femoral Version Among Primary Total Hip Arthroplasty Patients: Implications for Implant Placement

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INTRODUCTION: Instability following primary total hip arthroplasty (THA) continues to be a major cause of reoperation. A "combined version" approach accounts for the femoral version contribution to stability; however, the data on native femoral version in THA patients is lacking. Therefore, we aimed to characterize femoral version in a large population of primary THA patients.

METHODS: The study was a retrospective review of a deidentified commercial database. 2,643 patients underwent preoperative CT scans prior to THA between June 2018 and February 2024. 58% were female and mean age was 68 years. Femoral version was calculated using axial images to define the midline of the femoral neck and the posterior condylar axis.

RESULTS: Mean femoral version was $16.4\pm10.6^{\circ}$ (range, -36 to 55), $17.8\pm10.8^{\circ}$ (range, -21 to 55), and $14.5\pm10.0^{\circ}$ (range, -35 to 53) for the total, female, and male cohorts, respectively (Figure 1). Native femoral version differed by more than 10° compared to median value in 30% of patients. Native femoral version differed by more than 20° compared to the median value in 6% of patients. Female femoral version was significantly different from male femoral version, median 17.5° vs 14.4° (p<0.01).

DISCUSSION AND CONCLUSION: Native femoral version varies widely in a large cohort of THA patients. Surgeons' ability to intentionally adjust stem version from native version at the time of THA depends on multiple technical and patient factors with tradeoffs. Surgeons should be cognizant of native femoral version population norms, consider directly measuring native femoral version in each patient, and account for adjusting femoral version when selecting their stem implant design and size. Given the high variability of femoral version in THA patients and consequences for functional outcome, additional study is warranted.



Native femoral anteversion, degrees