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DIRECT AND INDIRECT MEASUREMENT OF FEMORAL ANTEVERSION: COMPARISON OF ESTABLISHED METHODS The anteversion angle of the proximal femur, an important consideration in total hip arthroplasty and corrective hip osteotomy, has not been given an universally accepted definition. This reflects the fact that a direct measurement method with specific anatomic criteria (e.g., osteometric method of Ruff and Hayes¹) has not been established for validating the accuracy and reliability of commonly used indirect methods of femoral anteversion measurement [i.e., computed tomography (CT) and biplane radiography]. Additionally, no study to date has rigorously validated the CT method, which is currently considered the "gold standard" for determining femoral anteversion in clinical and experimental settings. In the present study, anteversion angles of ten adult human femora were measured using these direct and indirect methods. Equipment used included: 1) an osteometric table for making direct measurements¹; and 2) a standard hospital X-ray machine and a second-generation Picker 1200 SZ CT scanner for making indirect measurements^{2,3}. Data collected on the ten human bones showed a mean femoral anteversion angle of 24.4° (4.2°) when biplane radiography was used. However, when CT and direct osteometric methods were employed, the mean anteversion angles were 12.4° (1.5°) and 9.6° (3.3°), respectively. Parentheses represent standard deviations. These results and differences suggest that biplane radiography, on average, statistically ($p < .05$) exaggerates the anteversion angle of the proximal human femur by 12.0° and 14.8° when compared to CT and direct osteometric methods, respectively. In contrast, the discrepancies between CT and direct osteometric methods were statistically less significant (within 2.8°). These data validate the accuracy and reliability of the CT method as the "gold standard" for determining the true anteversion angle (measured directly using osteometric method) in human femora. Differences in anatomical criteria used to make the measurements probably account for the marked discrepancies observed between biplane radiography versus CT and direct osteometric methods. Consequently, CT determination of the femoral anteversion angle should be considered the method of choice for both clinical and research purposes. [1) Ruff and Hayes, *Am. J. Phys. Anthropol.*, 60, 1983. 2) Ogata and Goldsand, *JBJS*, 61-A, 1979. 3) Hernandez et al., *Am. J. Roentgenol.*, 137, 1981.]

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