

Is radiographic measurement of distal femoral torsion reliable?

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BACKGROUND: Distal femur torsion (DFT) is a crucial parameter in knee replacement surgery. The reference standard for measuring DFT is posterior condylar angle (PCA) measurement using computed tomography (CT). The objective of this study was to assess the feasibility and reliability of a radiographic PCA measurement method.

MATERIALS AND METHODS: We studied 125 osteoarthritic knees in 79 patients (42 women and 37 men) with a mean age of 71.6 ± 8.8 years (range 47 to 86 years); 32 knees were aligned, 85 in varus, and eight in valgus. DFT was measured on an antero-posterior (AP) radiograph of the knee in 90° of flexion (known as the seated AP view). The PCA was defined as the angle subtended by the tangent to the posterior condyles and the transepicondylar axis (anatomic PCA [aPCA]) or the line connecting the lateral epicondyle to the medial sulcus (surgical PCA [sPCA]). The PCA was conventionally recorded as positive in the event of external torsion and negative in the event of internal torsion. PCA measurements were performed three times by each of five observers to allow assessments of inter-observer and test-retest reliabilities.

RESULTS: aPCA was consistently negative (mean, $-6.1 \pm 1.6^\circ$) (range, 0 to -10°); inter-observer and test-retest reliability were satisfactory (0.54)

CONCLUSION: Radiographic measurement of DFT is simple and non-invasive. Measurement reproducibility was satisfactory for aPCA but not for sPCA. aPCA showed marked inter-individual variability and tended to increase when the knee was in valgus. Mean aPCA values were comparable to those reported using CT. In contrast to CT, radiographic DFT measurement can easily be incorporated into the pre- and postoperative work-ups for knee replacement surgery, provided the patient can achieve 90° of knee flexion.

LEVEL OF EVIDENCE: Level IV, prospective cohort study.

Résumé en anglais

Notes

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