

Fixed-Bearing Medial Unicompartmental Knee Arthroplasty - Slight Varus, Just Right!

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Introduction: Mechanical axis alignment has been shown to influence the long-term outcome of fixed-bearing medial unicompartmental knee arthroplasty (UKA). However, a consensus on the optimal postoperative alignment target has not been established. This study compared the postoperative mechanical alignment of well-functioning UKAs against two groups of failed UKAs, including revisions for progression of lateral compartment arthritis (“progression”) and revisions for aseptic loosening or subsidence (“loosening”).

Methods: From our prospective institutional database of 3,539 medial fixed-bearing UKAs performed since 2000, we identified 37 UKAs revised for progression and 61 UKAs revised for loosening. Each of these revision cohorts was matched based on age at surgery, gender, body mass index, and postoperative range of motion with unrevised UKAs that had at least 10 years of follow-up and a Knee Society Score of 70 or greater (“success” groups). Postoperative alignment was quantified by the hip-knee-ankle (HKA) angle measured on long-leg alignment radiographs.

Results: The mean HKA at 4-month follow-up for the progression group was $0.3 \pm 3.6^\circ$ of valgus compared to $4.4 \pm 2.6^\circ$ of varus for the matched success group ($p < 0.001$). For the loosening group, the mean HKA was $6.1 \pm 3.1^\circ$ of varus compared to $4.0 \pm 2.7^\circ$ of varus for the matched success group ($p < 0.001$). The HKA angles were similar among both success groups ($p = 0.52$). The loosening group was revised at a mean of 3.3 ± 2.9 years compared to 5.4 ± 4.0 years for the progression group ($p = 0.004$).

Conclusions: Mechanical alignment in the coronal plane is an important factor in the setting of fixed-bearing, medial UKA. Patients with well-functioning UKAs at 10 years exhibited mild varus mechanical alignment of approximately 4° , whereas patients revised for progression of osteoarthritis averaged more valgus (mean 0.3° valgus) and those revised for loosening averaged more varus (mean: 6.1° varus). The optimal mechanical alignment for component survival is likely slight varus.