Coronal Plane Deformity in Total Ankle Arthroplasty: Short and Intermediate Term Analysis of Maintenance of Correction

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Summary:
Deformity correction with total ankle arthroplasty (TAA) is achieved with a combination of bone and soft tissue balancing techniques. As experience is gained, larger coronal plane deformities are being addressed. To date, there is no literature describing maintenance of the ankle deformity correction.

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Methods:
Radiographic review of 49 patients (52 ankles) who underwent total ankle arthroplasty using a stemmed 2 piece total ankle replacement, with a minimum of 6 months follow-up was performed. Revision total ankle arthroplasty was excluded. A standardized radiographic measuring protocol identified coronal plane deformities. The primary analysis was maintenance of deformity correction and subsidence of the tibial and talar components.

Results:
The mean preoperative valgus deformity was 6.7 degrees (r 2-24 degrees, SD 5.5), initial postoperative correction mean of 2.8 degrees (r 0-10, SD 2.4), and latest follow-up mean of 2.9 degrees (r 0-10, SD 2.7). The mean varus deformity was 9.1 degrees (r 1–28 degrees, SD 7.3), initial postoperative correction mean of 2.6 degrees (r 0-9, SD 2.6), and latest follow-up mean of 2.3 degrees (r 0-8, SD 2.2). Component position on both the tibia and talus changed significantly in the anteroposterior (AP) and lateral planes.

Conclusion:
Despite a significant change in the position of the tibia and talar components, no significant differences were found in the corrected AP deformity angle at an average follow-up of 82 weeks (r 25-182, SD:39). From this data, although there is component migration following implantation, articular congruity and deformity correction is maintained. Further research is needed to follow the progression of movement over time and to correlate implant movement with clinical outcomes.