Correction of Moderate and Severe Coronal Plane Deformity with the STAR Prosthesis

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Introduction:
Prior studies have demonstrated a correlation between the degree of preoperative coronal plane deformity and failure following ankle replacement. We reviewed all of our patients who underwent ankle replacement utilizing the STAR prosthesis from 2000 to 2009 to evaluate those with moderate (10° - 19°) and severe (20° or greater) coronal plane deformity.

Methods:
Out of one hundred thirty consecutive patients (133 ankles) identified, 43 patients had at least 10 degrees of preoperative coronal plane deformity on radiographic examination with a minimum of 12 month follow-up. Twenty-five ankles had 10° - 19° degrees of deformity and eighteen ankles had 20° or greater deformity. There were 29 males and 14 females. Average age was 66 (range, 41
to 79) years. Average length of follow-up was 41 (range, 12 to 98) months. Patients’ radiographs were evaluated pre-operatively, on initial and final post-operative examination.

Results:
Average talar pre-operative deformity was 17.9 (range, 10 to 29) degrees, while average initial talar post-operative deformity was 3.5 (range, 0 to 12) degrees. Average final talar post-operative deformity was 4.7 (range 0 to 14) degrees. Pre-operative and final correction of deformity was statistically significant ($p < 0.01$), but there was no significant difference between initial and final post-operative correction. Overall, recurrence of the preoperative coronal plane deformity occurred in 6/43 patients (14%). Full correction was maintained in 37/43 patients (86%). Half of the recurrences occurred in the three patients who had deformities over 25 degrees. Correction of the coronal plane deformities was achieved by using intra-operative soft-tissue balancing, including deltoid ligament release in 12 patients and lateral ligament reconstruction in one patient.

Conclusion:
Correction of moderate and severe coronal plane deformity with the STAR prosthesis is achievable with only soft-tissue balancing procedures with predictable results.