Total Ankle Arthroplasty with Calcaneo-Metatarsal Osteotomies for Ankle Osteoarthritis with Cavo-Varus Deformities: Early Results

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Introduction
To evaluate the short term clinical and radiographic results of the total ankle arthroplasty (TAA) with combined bony reconstructions to address the end-stage ankle arthritis with cavo-varus deformity. The end-stage ankle OA with cavovarus or hindfoot varus deformity is found to be relatively not uncommon. In order to successfully address the disease entity with TAA, the combined deformity has to be corrected adequately in order to restore neutral coronal plane alignment and a congruent articulation of the ankle joint. Deformity correction in the coronal plane must be judiciously considered in TAA since residual angular deformity or malalignment after the operation can result in instability, progressive edge-loading or subluxation of the bearing, leading eventually to arthroplasty failure.

Methods
This study is based on the 10 ankles (8 patients) of end-stage ankle arthritis with cavo-varus deformity that were treated with TAA with combined calcaneo-metatarsal osteotomies from September 2004 to June 2010 with at least 12 months follow-up. The combined bony procedures as well as the VAS pain score, AOFAS score, radiographic measurements and patient satisfaction were evaluated.

Results
Average follow-up period was 17.9 months (12-43) and the age was 66.2 years (55-76). Eighteen additional bony reconstructions such as lateral sliding calcaneal osteotomy(9) and 1st metatarsal dorsiflexion osteotomy(4) were performed in addition to TAA. VAS pain score improved from preoperative average 8.8 (6-10) to 2.4 (0-7) and the AOFAS score improved from 36.9 (14-71) to 89.3 (68-100) at final follow-up (p<0.05). TAS angle increased from preoperative average 83.8o degrees (81-87) to 88.3o (85-89) and at final follow-up (p<0.05). Also tibio-calcaneal angle (TCA) decreased from 19.0o to 0.2o and Talar dome-ground surface angle (TD-GSA) decreased from 21.2o to 5.1o at final follow-up (p<0.05). Ninety percent of the patients were satisfied with the surgery.

Conclusion
We confirmed that adjunctive bony reconstructions are often necessary to successfully address the end-stage ankle arthritis with varus hindfoot deformity. TD-GSA and TCA were found important radiographic parameters related to the current disease entity.