Title: A Retrospective Comparison of Total Ankle Arthroplasty versus Arthroscopically Assisted Ankle Fusion for End Stage Ankle Arthritis

Introduction: The use of noncemented anatomic total ankle prostheses are gaining widespread use in the United States. However, ankle fusion remains the gold standard procedure for end stage ankle arthritis. The goal of our study was to perform a retrospective evaluation of the safety and efficacy of a noncemented prosthesis to treat end stage ankle arthritis and compare the outcomes to arthroscopically assisted ankle fusion. We evaluated both cohorts based on the following outcomes: 1 - postoperative complications, 2-visual analogue pain scale, 3-SF-36 outcome scores, and 4-AOFAS scores. All data was collected at a minimum of 6 months postoperatively.

Method: Patients undergoing total ankle arthroplasty or arthroscopically assisted ankle fusions were asked to fill out AOFAS, SF-36, and VAS both pre-operatively and post-operatively. They also all underwent and full radiographic assessment with AP, lateral, dorsiflexion, and plantarflexion views of the operative ankle at least 6 months after surgery. These radiographs were assessed for adjacent joint changes and measurements of component placement, dorsiflexion and plantarflexion. Charts were reviewed to obtain any post-operative complications. The improvement in either group in SF-36, AOFAS, and VAS scores were analyzed using a two-sample paired Student t test. All procedures were performed by the senior authors and all of the total ankle arthroplasties were done using the same prosthesis.

Results: The charts of patients undergoing arthroscopic ankle fusions and total ankle arthroplasty performed by the senior authors between 2006 and 2011 were reviewed. In total there were 14 fusions and 35 total ankle replacements who had full sets of data. In the total ankle group there were 5 reported complications, which included varus malalignment, wound dehiscence, subtalar changes, and posterior tibial tendonitis. In the fusion group, there were 7 complications, which included primarily subtalar arthritis and nonunions requiring revision. The average time of follow-up was 17 months for the total ankle group and 30.5 months for the ankle fusion group. There was a statistically significant improvement in the physical component of the SF-36 score for patients undergoing both total ankle replacement (P<0.0001) and ankle fusion (P= 0.0184), however, the changes in the mental component of the SF-36 were not statistically significant in either group. Both groups showed improvement in their AOFAS scores post-operatively, which was statistically significant for both the fusion group(P = 0.0001) and the total ankle group (P<0.0001). VAS scores were also improved and statistically significant in both groups (P<0.0001). The average mechanical axis was 90.1 degrees in both groups.

Conclusion: Although our study is limited due to the small size of the arthroscopically assisted fusion group, we found that noncemented total ankle prostheses performed comparably to arthroscopically assisted ankle fusions in patients of similar ages with end stage arthritis. In addition, the total ankle group had fewer complications requiring secondary procedures. While both procedures can be associated with subtalar degenerative joint changes, total ankle arthroplasty is a safe and effective alternative to ankle fusion in patients with end stage arthritis.