Paper Session 4: TAA

Moderators:
Anish R. Kadakia, MD (Chicago, Illinois)
Todd A. Irwin, MD (Ann Arbor, Michigan)

10:14 am
Talar Subsidence in a Medullary Total Ankle Arthroplasty System

Presenting Author:
Jaymes D. Granata, MD, MBA (Westerville, Ohio)

Additional Authors:
Gregory C. Berlet, MD; Christopher F. Hyer, DPM, MS; Cody Vandommele, Bkin, MSc; Ryan T. Scott, DPM

Summary:
Total ankle arthroplasty (TAA) is gaining popularity in the management of ankle arthritis and is becoming an accepted alternative to fusion in certain patient populations. However, it has been well documented that there is an increase in the onset of arthritic changes within the surrounding joints. The purpose of this study is to evaluate the postoperative positional change of the talar component in the INBONE™ (Wright Medical) total ankle prosthesis.

Introduction:
Total ankle arthroplasty (TAA) is gaining popularity as the treatment option for ankle arthritis. There are currently 4 FDA approved total ankle prosthesis available for use in the United States, with varying designs and surgical techniques. Despite the increasing use of total ankle replacements, there is very little data on implant specific outcomes. Successful long-term results are associated with accurate implant positioning at the index surgery and maintenance of this position over time. The purpose of this study is to evaluate the postoperative positional change of the talar component in the INBONE™ (Wright Medical) total ankle prosthesis.

Methods:
A chart and radiographic review of consecutive patients who underwent primary TAA with the INBONE™ (Wright Medical, Arlington, TN) prosthesis was performed, with a minimum of 6 months follow-up. Both INBONE™ 1 and INBONE™ 2 prosthesis were used. The INBONE™ 2 prosthesis has a redesigned talar component. IRB approval was obtained for this study. Patient charts were reviewed for adequate inclusion criteria. Patients with less than 6 months follow-up, incomplete medical documentation, lack of appropriate weight bearing films, and revision total ankle arthroplasty were excluded.

Results:
Fifty-two (52) TAA’s were identified in 50 patients, 24 males and 26 females, 27 left and 25 right, with an average age of 62 years -old (Std. Dev: ± 9 years) at the time of surgery. Forty-four (44) arthroplasties were first generation prosthesis (INBONE™ 1) and 8 were second generation (INBONE™ 2). The average follow-up time was 19.3 months (Std. Dev: ± 8.6 months, Range: 11.3 – 40.8 months). A statistically significant difference (p <.05) was found in both the translational and rotational position of the talar component in the anteroposterior (AP) and lateral planes (Table 1), comparing the first postoperative weight bearing radiograph to the most recent follow-up. When comparing means by implant type, only delta AP translation of the talar component was significant (p =0.0432). Due to differences in the location of the joint line from patient to patient, the difference (delta) in the position variables could be negative or positive based on our selection of the reference frame at the distal end of the malleoli. For this reason, we report the results for positive or negative delta values separately, though each value indicates subsidence. The p-value for polyethylene wear was not significant (p=0.4541), indicating that the movement was from implant subsidence, not polyethylene wear.

Conclusion:
The results of our current study suggest that the position of the talus changes (translates and rotates) in multiple planes over time. The clinical implications of this movement are not completely understood. The implant movement could be related to failure or, despite the fixed bearing, the talus could be correcting towards a preferred position. Further research is needed to link implant settling/subsidence to clinical outcomes in the INBONE™ TAA system.