COFAS Multicenter Study Comparing Total Ankle Replacement and Ankle Fusion: Mid-Term Results

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Author(s): Timothy R. Daniels, MD, FRCSC
Alastair S.E. Younger, MBChB, MSc ChM, MD, FRCSC
Murray J. Penner, MD, BSc(M.Eng), FRCSC
Kevin J. Wing, MD, FRCSC
Peter J. Dryden, BSc,Msc, MD, FRCSC
Hubert Wong, PhD
Mark A. Glazebrook, MSc, PhD, MD, FRCS

Introduction
To present the mid-term results of a prospective, multicenter total ankle arthroplasty and arthrodesis database.

Methods
Between November 2001 and July 2007, patients were recruited by 4 surgical centers across Canada and underwent either ankle arthroplasty (TAR) or ankle arthrodesis (AA). Patient characteristics collected included demographics, comorbidities, and diagnoses. Surgical data gathered included implant type, concurrent procedures, complications, and revisions. The primary outcome measure was the Ankle Osteoarthritis Scale (AOS). Secondary outcome measures were Short Form-36 (SF-36) scores and revision rates. Revision rates with exchange or extraction of components as endpoint were calculated for TAR patients. For AA patients, revision was defined as any surgery required to correct malunion, non-union, or persistent symptoms, and amputation events. Linear mixed effects models were used to compare the difference between the TAR and AA groups in AOS and SF-36 outcomes at final follow-up, with adjustment for baseline characteristics.

Results
Of 372 patients enrolled in the study, complete records for 337 patients (90.5%) were available for analysis. These included 242 TARs and 95 AAs with a mean follow-up of 4.9 years. The two groups were similar for sex (TAR: 53.2% male; AA: 60.9% male), BMI and operated side. The TAR group was significantly older (62.8 ± 11.0 years; AA: 54.6 ± 11.6 years; p<0.001) and had a higher rate of inflammatory arthritis (p=0.001). Diabetes and smoking during the 12 months prior to surgery were more prevalent in the AA group (p=0.05 and p=0.01, respectively). AOS and SF-36 scores improved in TAR and AA patients following surgery (Table 1). Baseline AOS scores and SF-36 PCS scores were similar for the two groups. Baseline SF-36 MCS scores were slightly lower in the AA group (p=0.03). After adjustment for baseline characteristics and baseline AOS score, average AOS scores at final follow-up were not significantly different across the two groups (1.7 units higher in the TAR group; 95% CI: -4.6, 8.0). Similarly, after adjustment for baseline characteristics and baseline SF-36 scores, average SF-36 PCS and MCS scores at final follow-up were not significantly different across the TAR and AA cohorts (PCS: 1.1 units higher in the TAR group; 95% CI: -2.0, 4.3; MCS: .07 units lower in the TAR group; 95% -2.7, 2.6). Twenty-two patients underwent revision surgery. Three AA patients required revision, all within the first 2 years following surgery. A total of 19 TAR patients underwent revision, from 1 month to 7 years after surgery.
Conclusion
This is the first longitudinal multi-centered clinical study comparing the intermediate results of TAR to AA. Validated outcome scores indicate that TAR is comparable to AA for the management of end-stage ankle arthritis with a higher revision rate in the TAR group. Further work is required to identify the advantages and disadvantages of each procedure.