Effect of Obesity on Total Ankle Arthroplasty: Intermediate- to Long-Term Outcomes

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Introduction/Purpose:
Elevated Body Mass Index has been studied in the hip, knee, and shoulder arthroplasty literature, and has been associated with increased perioperative complications and greater failure rates after surgery. In contrast, few studies have evaluated the effect of elevated BMI on implant failure rates and survivorship after TAA. Therefore, the purpose of this study was to evaluate the effect of obesity on intermediate- to long-term implant failure rates and survivorship after total ankle arthroplasty (TAA).

Methods:
A chart review was performed for all patients aged 18 and older who underwent primary TAA between April 2003 and September 2009 with minimum 5-year follow-up. Patients were separated into a reference group with BMI less than 30 kg/m², and an obese group with BMI greater than or equal to 30 kg/m². Main outcomes included 5-year implant survivorship, 5-year implant failure rate, and implant failure rate at final follow-up. Implant failure was defined as removal of metal or polyethylene components, tibiotalar fusion, or amputation.

Results:
A total of 91 patients (97 TAAs) were identified with minimum 5-year follow-up. Forty-six patients (49 TAAs) were defined as obese. Mean follow up was 8.16 ± 2.02 years (range, 5.08-11.48) in the reference group and 7.7 ± 1.97 years (range, 5.00-11.85) in the obese group (p = .26). Mean BMI in the obese group (33.54 ± 3.72 kg/m²; range, 30-45.2) was significantly greater than that of the reference group (24.81 ± 2.99 kg/m²; range, 19.6-29.8) (p < .01). Using multivariable logistic regression, obese patients had a significantly greater probability of implant failure by final follow-up (adjusted odds ratio, 2.8 [95% CI, 1.04 to 7.53], p = .04). There was a similar trend towards an increased probability of implant failure in obese patients by 5 year follow up, but it did not reach statistical significance (p = .06). Cox regression analysis of 5-year implant survivorship showed no significant difference between the two groups (adjusted hazard ratio, 1.89 [95% CI, 0.77 to 4.65], p = .17). However, when compared to obese patients with inflammatory or posttraumatic arthritis, obese patients with osteoarthritis demonstrated a significantly decreased 5-year survivorship (adjusted hazard ratio, 3.73 [95% CI, 1.05 to 10.43], p = .04).

Conclusion:
This study demonstrated an increased long-term risk of implant failure among obese patients that was not seen in the intermediate-term. Furthermore, obese patients with primary osteoarthritis were found to have a significantly decreased 5-year implant survivorship after ankle arthroplasty compared to obese patients with inflammatory or posttraumatic arthritis, and therefore, should be counseled appropriately when deciding between arthroplasty and arthrodesis.