

Relationship between Diabetes Mellitus and Complications in Total Ankle Arthroplasty

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Purpose

With advances in technology, total ankle replacement (TAR) is becoming more frequently utilized for end-stage arthritis of the ankle. Early studies have recommended TAR for a very specific patient population with limited co-morbidities, specifically excluding patients with diabetes mellitus. Foot and ankle surgeons today are performing TAR in patients with complex comorbidities, including diabetes. The purpose of this study was to compare the complication rates of TAR in two groups; patients with diabetes mellitus and patients without diabetes.

Methodology

This is a retrospective review evaluating patients who underwent TAR by the primary surgeon (JMC) over the past 6 years. All patients with the comorbidity of diabetes mellitus were included in group one. Group two included a cohort of non-diabetic patients whom were randomly selected to create similar cohort sizes. Patient demographics including comorbidities, concomitant procedures, and post operative complications were recorded.

Total	N= 28
Age (mean, range)	69.8 (47-84)
Follow up in months (mean, range)	33.4 (12-69)
Gender	Male: 15 (54%) Female: 13 (46%)
Tobacco Use	Current: 1 (3.6%) Former: 10 (35.7%) Never: 17 (60.7%)
Rheumatoid Arthritis	3 (10.7%)
Concomitant Procedures	28 (100%)

Table 1. Patient demographics

Results

221 patients underwent total ankle replacement between March 2012 and July 2017. From that sampling, charts of 13 patients with diabetes mellitus were available. A random selection of 15 patients without diabetes mellitus served as the control group. Average follow up was 34.3 months (range 12-69) for the diabetes mellitus group and 32.4 months (range 13-66) for the control group. Average age at the time of implant was 69.5 years (range 55-84) for DM and 70 (47-83) for non-diabetic. 7 males, 6 females in the diabetic group and 8 males, 7 females in the control group. Total complication rate for patients with diabetes mellitus was 15.4% (2) and 13.3% (2) in the control group. There was no statistical difference between the groups ($p = 0.441$). All patients underwent at least one concomitant procedure at the time of ankle replacement.

Complications		
Cohort	N	Complication
Diabetic	2	Wound dehiscence: I&D with graft application Wound dehiscence: I&D
Non-diabetic	2	Deep infection: Antibiotic spacer; revision Deep infection: Antibiotic spacer; revision and abdominal free flap

Table 2. Complications



Figure 1. Incision dehiscence

Figure 2. Antibiotic spacer after deep infection



Figure 3. Incision dehiscence

Statistical Analysis

	N	Complication Rate	P value
Diabetes Mellitus	13	2/13 (15.4%)	0.441
Control	15	2/15 (13.3%)	
Total	28	4/28 (14.3%)	

Table 3. Statistical analysis

Literature Review

A projected 380 million people projected to have diabetes by 2025.¹ Historically, diabetics have been shown to have higher incidence complications in ankle surgery, hip arthroplasty, and total knee arthroplasty.²⁻⁴ These complications often include wound dehiscence, operative site infections, increased hospital stay, and poorer functional outcome. Current literature reports complication rates of up to % in TAR. Additionally, diabetes has been listed as a relative complication.⁵

Analysis & Discussion

As technology improves, the indication for TAR continues to expand. In this retrospective review, diabetic patients had similar complication rates when being compared to a control group. Both groups had reoperations related to the arthroplasty, but there was no statistical significant difference between the two groups ($p=0.441$). The findings from this study are similar to the results published by Gross et al. which showed similar reoperation rates in patients with diabetes (10%) when compared with non diabetics (14.5%) undergoing TAR.⁶

References

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