Revision TKA in the Morbidly Obese Patient

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INTRODUCTION: Obesity continues to be a worldwide epidemic. The number of obese and non-obese patients opting for total knee arthroplasty (TKA) continues to increase. The risk of complications and failure following primary TKA leading to revision surgery in the obese patient is greater compared to non-obese cohorts. The number of obesity patients undergoing revision TKA has tripled from the years 2002 – 2012. The purpose of this study was to investigate the clinical results following revision TKA in the morbidly obese (BMI > 40) with a minimum of 2 years follow-up.

METHODS: This retrospective, IRB approved study compared the results of revision TKA in the morbidly obese patient (BMI >40) to a cohort with BMI <35. One hundred and twelve patients with BMI > 40 who underwent revision TKA procedures were identified from an institutional total joint registry and matched with a cohort of 112 revision TKA patients with BMI < 35. Clinical results, complications, and patient-reported outcome measures (PROMs) were reviewed and compared with a minimum 2 year follow-up. Mean age was 61.1 (32-81) in the study group vs 66.2 (40-86) in the control (p=0.00003). Mean BMI was 44.6 (40-56.6) in the study group vs 29 (17.2-34.2) in the control ($p=1.7x10^{-80}$). Mean length of follow-up was 76.9 months (24-192.2) in the study group vs 50.2 months (24.2-104.5) in the control ($3.8x10^{-8}$). Statistical analysis was performed using one and two tailed t-tests with a p value of 0.05 set as the threshold for statistical significance utilizing Microsoft Excel.

RESULTS: Preoperative metrics demonstrated a significant difference in knee flexion (102° in morbidly obese group vs 110° in the control group, p=0.0005) and KS Function score (45 vs 51 in the control group, p=0.05). There were significant differences in postoperative KS Function score (57 vs 73, p=0.00003), postoperative PROMIS-10 physical score (37 vs 49, p=0.0004), and postoperative PROMIS-10 mental score (45 vs 54, p=0.03). No statistical difference was observed in postoperative knee flexion, extension, KOOS JR, FJS-12, and Likert Satisfaction Score. The incidence of failure leading to re-do revision was 20/112 (17.9%) in the study group vs 17/112 (15.2%) in the control group (p=0.59). Incidence of PJI was 11/112 (9.8%) in the study group and 6/112 (5.4%) in the control group (p=0.21). Incidence of postoperative extensor mechanism rupture was 6/112 (5.4%) in the study group and 0/112 (0.0%) in the control group (p=0.01). All-cause survivorship was 92/112 (82.1%) in the study group and 95/112 (84.8%) in the control group (p=0.59).

DISCUSSION: Our study demonstrated that patients with a BMI > 40 experience at least some level of functional deficiency as well as an increased risk of extensor mechanism injury postoperatively when compared to a cohort of patients with BMI < 35. There does not appear to be any significantly increased risk for failure leading to re-do revision. Although there was a trend for increased PJI in the morbidly obese group it was not significant. Despite the presence of inferior PROMs, morbidly obese patients appear to demonstrate equivalent levels of postoperative survivorship and satisfaction at a minimum 2-year follow-up compared to non-obese patients. Increased attention is needed to minimize the risk of extensor mechanism disruption and PJI in the morbidly obese patient undergoing revision TKA.

SIGNIFICANT/CLINICAL RELEVANCE: This study addresses a growing clinical issue that has a paucity of literature in existence investigating its ultimate impact on this growing patient population. We hope to provide a foundation for understanding the clinical impact that this topic brings to enable future work to address these disparities.

IMAGES AND TABLES:

Table 1. Complications Requiring Re-do Revision or Removal of All TKA Implants

	Control Patients BMI <35	Study Patients BMI >40	T-Test/Chi-Square Test (p)
Total	17	20	0.59
Infection	6	11	0.21
Instability	7	4	0.36
Aseptic loosening	3	3	1
Peri-prosthetic Fracture	1	0	0.32
Rupture of Arthrotomy	0	1	0.32
Dislocated TKA	0	1	0.32

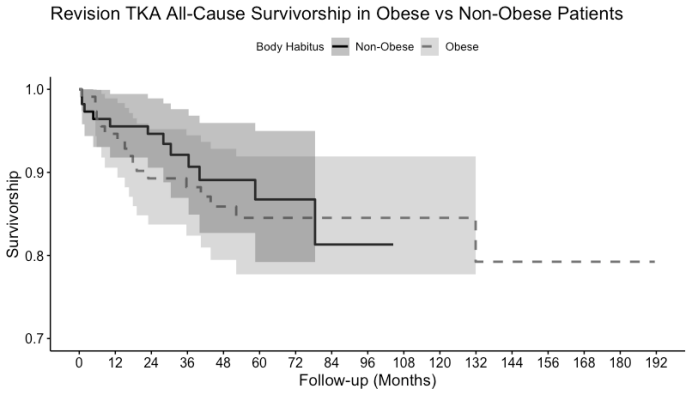

Figure 1. Kaplan-Meier Survivorship Curve for all-cause survivorship between study and control groups.