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The effect of increased body mass index on component alignment in Total knee arthroplasty

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Background: Total knee arthroplasty (TKA) outcomes can depend upon patient related factors such as body mass index (BMI), and surgical related factors such as component alignment. Current literature comparing BMI and TKA component alignment is inconclusive. Some studies find limited differences in outcomes and others demonstrate inferior results. Malpositioning of the tibial or femoral component is associated with early failure. The aim of this study was to evaluate the relationship between BMI and TKA component alignment.

Methods: 320 primary cemented posterior cruciate-substituting TKAs were performed by three surgeons over 12 months beginning in January 2009. 69 TKAs were excluded due to inadequate radiographs. 149 knees were placed in the obese group (BMI>30) and 102 knees were placed in the non obese group (BMI<30). Postsurgical radiographs were reviewed by a PGY-5 orthopaedic surgery resident blinded to the individual's BMI. Five radiographic measurements were included: Coronal tibiofemoral angle (CTFA), coronal femoral component angle (CFCA), coronal tibial component angle (CTCA), sagittal femoral component angle (SFCA), and sagittal tibial component angle (STCA). Pre-surgical BMI was calculated through medical records. Chi square test was used to compare the groups with regard to sex and operative side. Student T test was used to compare the groups with regard to age, CTFA, CFCA, CTCA, SFCA, and STCA. Statistical significance was set for $P=0.05$.

Results: No statistically significant differences were found between the two groups with regard to sex or operative side. The mean patient age for the non obese group was significantly higher than the obese group (71.4 and 63.9 respectively $P=0.001$). No significant difference was found between the mean values for CTFA, CFCA, CTCA, SFCA, and STCA between the non obese and obese group ($P=0.0556$, $P=0.2246$, $P=0.7264$, $P=0.5223$ and $P=0.7059$, respectively).

Discussion: Malpositioning of TKA components is associated with early failure. Current literature questions if BMI is directly related to component malpositioning. It was found that there was no statistically significant relationship between obesity and TKA alignment.

Biography

Mark Meyer graduated from Kent State University and earned his Medical Degree from Northeastern Ohio University College of Medicine. He completed his internship and residency at the Akron General Medical Center, in Ohio, and completed a Fellowship in Musculoskeletal Pathology at the University of Florida. His professional expertise is the treatment of tumors of the bone and soft tissue as well as robot assisted joint replacement surgery. He currently serves as Department Head of Orthopaedic Oncology at Ochsner Medical Center in New Orleans Louisiana. He has published multiple articles in reputed journals.

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