Aseptic Femoral Component Loosening is Not Associated with BMI in Primary TKA

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INTRODUCTION: Prior studies identified obesity as a risk factor for tibial component aseptic loosening following primary total knee arthroplasty (TKA). However, the association between BMI and aseptic femoral component loosening has not been well-studied. Therefore, this study evaluated aseptic femoral component loosening and BMI accounting for coronal alignment.

METHODS: A total of 14,574 patients who underwent primary, cemented posterior-stabilized (PS) TKAs from 2005-2022 were identified using our institutional total joint registry. The mean age was 68 years, mean BMI was 33 kg/m^2, and 56% were female. Postoperative AP knee radiographs were analyzed to measure tibiofemoral angle, anatomic medial proximal tibial angle (MPTA), and anatomic lateral distal femoral angle (LDFA) with our validated AI algorithm. In the overall cohort, the mean postoperative tibiofemoral angle was 4° ± 3° of valgus, with mean LDFA and MPTA of 86° ± 2° and 89° ± 3°, respectively. Obesity was classified as class I (30-34.9 kg/m^2), II (35-39.9 kg/m^2), and III (≥40 kg/m^2). Mean follow-up was 7 years.

RESULTS: The 15-year survivorship free of aseptic femoral component loosening was 99%. There were 36 cases of atraumatic and aseptic femoral component loosening confirmed intraoperatively during revision TKA (mean 8 years after primary TKA). There was no association between aseptic femoral component loosening with obesity (HR 1-1.3; p=0.65-0.98). Controlling for LDFA, there was no association between aseptic femoral component loosening with class I (HR 1.3; p=0.69), II (HR 0.9; p=0.92) or III obesity (HR 1.0; p=0.96). Controlling for MPTA and tibiofemoral angle, there was similarly no association between aseptic femoral component loosening with obesity (HR 0.9-1.3; p=0.66-0.96).

DISCUSSION AND CONCLUSION: In this series of over 14,000 cemented primary PS TKAs, aseptic femoral component loosening was uncommon, with the 15-year survivorship being 99%. No associations were found between BMI and aseptic femoral component loosening irrespective of radiographic alignment.