

What Is the Value of Component Loosening Assessment of a Preoperatively-Obtained Bone Scan Prior to Revision Total Knee Arthroplasty?

David C. Holst, MD, Marc R. Angerame, MD, Douglas A. Dennis, MD, Jason M. Jennings, MD

Introduction: Bone scintigraphy (BS) is frequently ordered to investigate cause of failure following total knee arthroplasty (TKA). Its correlation of component loosening with intraoperative findings at the time of revision TKA (rTKA) has not been well studied. This study investigated correlations between preoperatively obtained radiologist report (RR) of BS, preoperatively documented surgeon predictions (SP) of component loosening, and operative reports documenting intraoperative findings (IF).

Methods: Our institutional database was retrospectively reviewed for all rTKA done after BS and revealed 96 eligible cases. The RR and SP cohorts were subdivided into all potential combinations of component loosening and were then compared to each other as well as IF. In addition to calculating percentage correct of RR and SP compared to IF, the levels of agreement between RR and SP were compared using the kappa statistic.

Results: Of the 96 cases, the RR correctly correlated with IF in 35 cases (37%), and the SP was correct in 66 cases (69%), indicating the preoperative interpretation of the surgeon regarding component loosening at rTKA was correct more frequently ($p < 0.001$). The kappa statistic between RR and IF was only 0.23 (95% CI 0.15-0.32), indicating minimal agreement. The kappa statistic between SP and IF was 0.57 (95% CI 0.46-0.68), indicating weak agreement. Furthermore, the kappa statistic between RR and SP was 0.36 (95% CI 0.27-0.45), also indicating minimal agreement.

Conclusions: In rTKA, there is weak agreement regarding component loosening between a radiologist's opinion of a preoperatively obtained bone scan and the surgeon's preoperative interpretation of clinical and radiographic data. While neither reliably accurately predicts what is found at the time of rTKA, the surgeon's preoperative interpretation is more closely correlated with actual intraoperative findings of component loosening.