Paper #22

Body Mass Index Is a Better Predictor of Periprosthetic Joint Infection Risk than Local Measures of Adipose Tissue Following Total Knee Arthroplasty

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Introduction: Both body mass index (BMI) and local measures of adiposity at the surgical site have been identified as potential risk factors for periprosthetic joint infection (PJI) following total knee arthroplasty (TKA). We aimed to evaluate previously used measures of assessing knee adiposity and to determine what measure is best for predicting both surgical duration and PJI following TKA.

Methods: We performed a multicenter retrospective review of 4,745 patients who underwent a primary TKA over the period of January 2013 through December 2016 across three hospitals. Patient demographics, comorbidities, surgical duration and postoperative infection status within one-year were recorded. Preoperative weightbearing AP and lateral x-rays were analyzed for each patient to determine pre-patellar adipose thickness, bony width of the tibial plateau, and total soft tissue knee width. From this, the knee adipose index (KAI) was calculated from the ratio of bone to total knee width. Multivariate analysis was performed to assess risk factors for PJI.

Results: The PJI rate at one year was 0.7% (31/4, 745). There was a strong correlation between PJI risk and BMI >35 (OR 2.9, 95% CI 1.4-6.1). In contrast, neither KAI nor pre-patellar fat thickness showed a significant correlation with PJI risk ($p>0.05$). We observed substantial variability in local measures of adiposity (KAI and pre-patellar fat thickness) compared to BMI. Surgical duration was longer with higher BMI and higher measures of local adiposity (KAI and pre-patellar fat thickness).

Conclusions: Local adiposity at the knee varies greatly for any given BMI. BMI is superior to measures of local adiposity at the surgical site in predicting PJI following TKA. The systemic effects of obesity may be more important than local adipose tissue in PJI risk following TKA.