Paper #6

Intraoperative Variability with Load Sensing Technology during Total Knee Arthroplasty

Scott R. Nodzo, MD, Vincenzo Franceschini, MD, **Alejandro Gonzalez Della Valle, MD**

Introduction: The validity and reliability of load sensing technology needs to be assessed in order to define intraoperative device expectations.

Methods: 54 patients underwent TKA using a load-sensing tibial insert to assist with ligament balance. All femoral components were implanted parallel to the transepicondylar axis (TEA). The posterior condylar angle (PCA) was measured. Load measurements were recorded at 10, 45, and 90 degrees of flexion with the trial (TRIAL) components and with definitive (FINAL) cemented implants. The surgeon was blinded to the load values. Adequate knee balance was defined as a load differential ≤15 pounds between compartments. Correlation and linear regression analysis were used to evaluate the compartment load differential between TRIAL and FINAL values. Additionally, we assessed correlation between the PCA and the load differential recorded at 45 and 90 degrees of flexion.

Results: Adequate balance with TRIAL and FINAL implants was observed in 89% of TKAs. Linear correlation between the TRIAL and FINAL loads in the medial compartment at 10 degrees (R2= 0.22, p=0.0003), 45 degrees (R2= 0.22, p=0.005), and 90 degrees (R2= 0.09, p=0.02) of flexion were statistically significant. No significant correlation between the TRIAL and FINAL values were identified in the lateral compartment at any flexion pose. There was no relationship between the magnitude of the PCA and medial compartment loads at 45 (R2= 0.0006; p=0.86) and 90 degrees (R2= 0.004, p=0.62) of flexion. A similar finding was observed in the lateral compartment; suggesting that compartment loads were not significantly affected with femoral components implanted parallel to the TEA, regardless of the magnitude of the PCA.

Conclusions: Variability between the TRIAL and FINAL load measurements was higher in the lateral than medial compartment. An adequately balanced flexion gap is frequently achieved when the femoral component is implanted parallel to the TEA, and not the PCA.

Notes