Measuring The Change In Fixed Flexion Deformity Following Robotic Arm-assisted Unicompartmental Knee Arthroplasty

Introduction

Residual fixed flexion deformity (FFD) after unicompartmental knee arthroplasty (UKA) is associated with poorer functional outcomes. There is a paucity of evidence that describes the change in FFD with UKA however. Our study aims to measure FFD changes in patients undergoing medial UKA and investigate if these changes correlate with clinical outcomes.

Methods

Our study includes 136 patients that underwent robotic-arm assisted medial UKA. The procedures took place between 2018 and 2022. The study includes 75 (55.1%) males and 61 (44.9%) females with a mean age of 67.1 years. Patients were allocated into three separate study groups based on the degree of pre-operative FFD: 0.5 - ≤5 degrees, 5 - ≤10 degrees and >10 degrees. Optical motion capture technology used intraoperatively allowed for the assessment of pre- and postoperative FFD. Clinical Pre- and post-operative Oxford Knee Scores (OKS) were collected.

Results

We found that the mean pre-operative navigated (NAV) FFD measured 5.9° ± 3.4. The mean postoperative NAV FFD was 3.0° ± 2.5. This signified a mean FFD correction of 49.2%. The mean pre-operative clinical FFD was 5.5° ± 4.2 for the entire study cohort, which decreased to 3.0° ± 2.6 and 1.8° ± 1.8 at six weeks and one-year post-operatively, respectively. Statistically significant improvements in patient reported outcome measures (PROMs) compared with baseline values was seen in all groups, $p<0.001$. Regression analyses revealed that patients who experienced larger FFD correction displayed greater improvement in PROMs ($\beta = 0.609$, $p = 0.049$, 95% CI 0.002, 1.216).

Discussion

We found that an FFD correction of approximately 50% was seen across all three study groups. Patients that experienced greater correction demonstrated greater OKS improvements. These findings provides us a useful supplement to clinical decision-making concerning UKA candidacy and the anticipated FFD correction.