The Forgotten Sagittal Plane: Posterior Tibial Slope Influences Posterior-stabilized TKAs

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INTRODUCTION:
Recent literature has focused almost exclusively on coronal alignment and its impact after primary total knee arthroplasty (TKA). However, little attention has been given to sagittal plane alignment, with particular influence of posterior tibial slope (PTS). The goals of this study were to investigate the effects of postoperative PTS on primary posterior-stabilized (PS) TKAs implant survivorship and clinical outcomes.
METHODS:
Our institutional total joint registry was used to identify 505 primary cemented PS TKAs that all had postoperative neutral coronal mechanical aligned and were completed between 2002 and 2017. We then measured all preoperative and postoperative PTSs on lateral radiographs and classified them into two groups: similar PTS (within 0° ± 3° of the preoperative PTS; 47%), and substantial change (>3° change from the preoperative; 53%). Overall, the mean preoperative PTS was 6° (range, 0 17°) and the mean postoperative PTS was 2° (range, -2 10°), with a mean decrease of 4°. The mean age was 70 years, mean BMI was 32 kg/m2, and 58% were females. Outcomes included implant survivorship, Knee Society score, and Forgotten Joint Score. The mean follow-up was 6 years.
RESULTS:
The 10-year survivorships free of any revision and any reoperation were 97% and 94%, respectively. There were 31 reoperations, including MUA (12 cases), aseptic revision (4 cases), and arthroscopic debridement (2 cases). Substantial change in PTS >3°, particularly when decreasing PTS, was associated with all 4 aseptic revisions and an increased 10-year reoperation risk (HR 2.3, p=0.04) when compared to TKAs in the similar PTS group. Preoperative and postoperative PTS did not influence survivorships. No significant differences in KSSs and FJS-12 outcomes were associated with preoperative, postoperative, and changes in PTS groups at 2 and 5 years.
DISCUSSION AND CONCLUSION:
In our large series of over 500 primary cemented PS TKAs all in neutral coronal mechanical alignment, the mean postoperative PTS was 2° and decreased by 4° from preoperative. Those with decreased PTS >3° had a higher 10-year reoperation risk, mainly related to arthrofibrosis.