Impact of Laxity and Balance on Early KOOS Pain Outcomes of a Posterior Stabilized TKA

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INTRODUCTION

- Optimal balance and laxity throughout flexion for minimizing pain has been investigated for deep dish PCL sacrificing total knee arthroplasty[1]
- Such targets in posterior stabilized (PS) TKA however, are not well understood
- The objective of this study was to investigate associations between intraoperative balance and laxity measurements with early outcomes in PS TKA and define clinically relevant thresholds for optimal outcomes

METHODS

- 108 PS TKAs using a multi radius femoral component design with deep dish tibial insert received robotically assisted PCL sacrificing tibia-first gap-balancing TKA (Demographics: Table 1)
- Gap and balance data was captured during trialing using a digital ligament tensioner under a load of 70-90 N
- 2 year KOOS scores recorded
- Spearman correlations and Wilcox t-tests were used to identify associations and compare groups

RESULTS

- Laxity and balance windows for significantly improved pain outcomes:

Flexion Angle	Balance (mm) (Med. – Lat.)	Laxity (mm)
Extension	-	Lat: -3.0 to -0.5 Med: -
Midflexion	±1.0	Lat: -1.5 to 2.0 Med: -2.0 to 1.5
Flexion	-2.5 to Neutral	Lat: -0.5 to 2.0 Med: -1.5 to 0.0

- Further improved outcomes found when all laxity (94.3 vs 83.0, p=0.0023) (Fig 1) or all balance targets (89.7 vs 83.1, p=0.0049) (Fig. 2) were combined.

CONCLUSION

- Intraoperative joint balance and laxity impacts patient reported outcomes in PS TKA to at least 2 years post-op
- PS knees prefer:
  - Midflex laxity ±2 mm
  - Relative lateral flexion laxity
- When balance and laxity windows were combined, further improved outcomes were observed
- Further research into the impact of patient demographics on optimal balance and laxity targets in a PS population is ongoing

Demographic	Value
Age (years)	68±8.9
BMI (kg/m^2)	29.9±5.3
Sex (%F)	64
Side (%L)	50.5

Table 1: Demographics of cohort

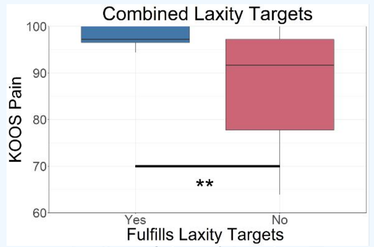

Figure 1: Combined Laxity Targets

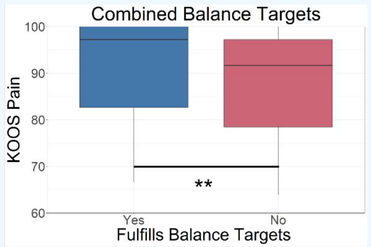

Figure 2: Combined Balance Targets

1) Wakelin, Edgar A, *et al.* "Improved Total Knee Arthroplasty Pain Outcome When Joint Gap Targets Are Achieved Throughout Flexion." *Knee Surgery, Sports Traumatology, Arthroscopy* (2021): 1–9.

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