Conversion to Total Knee Arthroplasty Following High Tibial Osteotomy or Distal Femoral Osteotomy and Unicompartmental Knee Arthroplasty: A Propensity-Matched Analysis

Griffith G. Gosnell MS, Katherine L. Esser BS, Isabella B. Jazrawi BA, Bradley Lezak MD, Nathaniel Mercer MD, Heath P. Gould MD, Laith M. Jazrawi MD, Eric J. Strauss MD, Michael J. Alaia MD
Division of Sports Medicine, Department of Orthopedic Surgery, NYU Langone Health, New York, NY

BACKGROUND

- High tibial osteotomy (HTO), distal femoral osteotomy (DFO), and unicompartmental knee arthroplasty (UKA) are surgical treatments for isolated compartment knee OA aimed at delaying total knee arthroplasty (TKA)
- There is limited direct comparison of TKA conversion rates between osteotomy and UKA using well-matched cohorts

OBJECTIVE

To compare rates of conversion to TKA and time to failure between patients undergoing HTO/DFO and those undergoing UKA for unicompartmental knee osteoarthritis.

METHODS

- Design: Retrospective, propensity-matched cohort study
- Inclusion: 40 – 70 years old, concomitant procedures (only chondroplasty and partial meniscectomy)
- Matching variables: Age, sex, BMI, KL grade, race, CCI
- Outcome measures: Progression to TKA, Revision surgery, Time to failure (TKA or revision)
- Statistical analysis: Fisher's exact test, Kaplan-Meier survival, log-rank test ($P < 0.05$)

Outcome	HTO/DFO	UKA	P-Value
TKA Conversions	7 (18.42%)	6 (12.5%)	0.448
Revisions	0%	1 (2.08%)	0.371
Overall Failure Rate	7 (18.42%)	7 (14.58%)	0.633
Mean Time to Failure (Years)	6.03	3.47	0.545

Table 1: TKA Conversion, Revision, and Failure Rates Following HTO/DFO and UKA

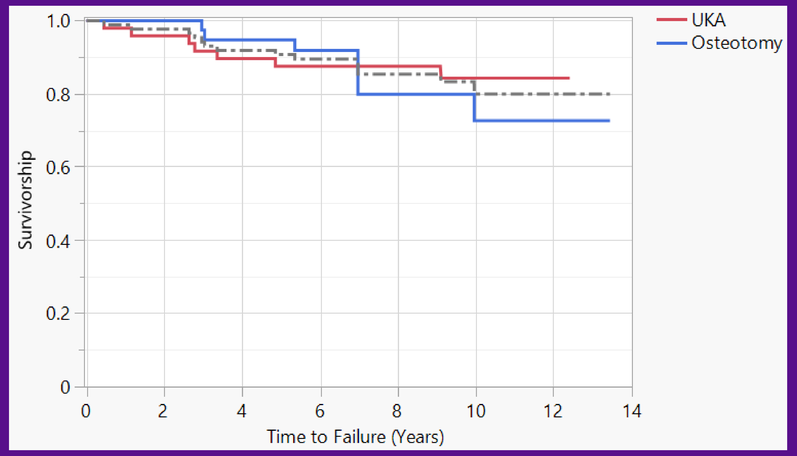

Table 2: Kaplan-Meier Survival Curve Comparing Time to Failure in HTO/DFO vs. UKA

RESULTS

- Sample Size: 86 patients
  - HTO/DFO: n = 38
  - UKA: n = 48
- Follow-up (Years)
  - HTO/DFO = 8.98 ± 2.51
  - UKA = 9.8 ± 1.17
- No significant difference in TKA conversion or failure rate between groups ($P = 0.633$)
- Kaplan-Meier analysis revealed similar survivorship over 9.4-year average follow-up ($P = 0.545$)
- Despite not reaching statistical significance, osteotomy group demonstrated a longer time to failure

CONCLUSIONS

- HTO/DFO and UKA provide similar durability in delaying TKA for unicompartmental OA
- HTO/DFO may offer longer time to failure, supporting its use in younger or more active patients
- Surgical selection should be individualized based on age, alignment, activity level, and patient preference

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