Does the Sequence of Same-Patient Total Ankle and Total Knee Impact Arthroplasty Failure Rates?

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INTRODUCTION: While it is known that total ankle arthroplasty (TAA) and total knee arthroplasty (TKA) alter limb alignment and biomechanics, knowledge is limited regarding how TAA and TKA sequencing might affect arthroplasty failure.

METHODS:

The TriNetX Global Collaborative Network was queried for patients who underwent TAA alone, TKA alone, TAA followed by TKA, and TKA followed by TAA. All database queries were constructed using corresponding CPT and ICD-10 codes. Cohort balancing was performed using propensity score matching with patient age, race, and sex. Rates of failure were compared between cohorts as defined as revision TKA, revision TAA, or ankle arthrodesis. Rates of failure were compared using chi-squared statistical testing. Statistical significance was defined as less than 0.05.

RESULTS: Results: Non-sequenced comparison between patients undergoing both TAA and TKA and those undergoing only TKA (Table 2) demonstrated a significant increase in TKA failure in the TAA and TKA group (2.66% vs. 1.47%; p = .05). Sequenced comparison using unmatched cohorts (Table 1) showed a significant increase in TKA failure among patients who had TAA then TKA (2.81% vs. 1.57%; p=.032), but not among patients who underwent TKA then TAA (1.61% vs. 1.57%; p=.53). This difference did not persist when controlling for confounding variables. No combination of procedures nor sequences resulted in a significantly higher rate of TAA revision.

DISCUSSION AND CONCLUSION: Patients who undergo both TKA and TAA appear to be at increased risk of revision TKA compared to patients who undergo TKA alone. While the proportion of revision TKA is higher in patients who undergo TAA then TKA, this difference does not persist when controlling for potentially confounding variables.

Table 1. Sequenced Analysis - Unmatched[ML1]

Procedure Sequence			n	Rate of Subsequent Knee Revision	Rate of Subsequent Ankle Revision
KNEE	then	ANKLE	621	10 (1.61%) p=.94	19 (3.06%) p=.87
ANKLE	then	KNEE	462	**13 (2.81%) p=.032***	10 (2.16%) p=.33
Isolated Procedure Comparison Values					
Ø	KNEE	Ø	1229362	19324 (1.57%)	-
Ø	ANKLE	Ø	12240	-	361 (2.95%)

p-values represent comparison against baseline values; significant <.05

Table 2. Non-Sequenced Analysis, Unmatched and Matched

	UNMATCHED	MATCHED
Non-Sequenced Group	**Rate of ANKLE Failure**	**Rate of ANKLE Failure**
Knee AND Ankle (1093)	32 (2.93%)	32 (2.93%)
Ankle NEVER Knee (12240)	326 (2.663%)	33 (3.02%)
p	.6045	.89
Non-Sequenced Group	**Rate of KNEE Failure**	**Rate of KNEE Failure**
Knee AND Ankle (1093)	29 (2.66%)	29 (2.66%)
Knee NEVER ankle (1229362)	18817 (1.53%)	16 (1.47%)
p	**.0025***	.05

p-values represent comparison against baseline values; significant <.05