

How Do Timed Up and Go Scores and Patient Reported Outcomes Compare After Total Knee Arthroplasty?

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DISCLOSURES: Ayers: PI of FORCE-TJR

INTRODUCTION:

Patient-reported outcomes (PROs) and functional tests are used to monitor recovery and patient satisfaction following total knee arthroplasty (TKA). Use of these measurement tools are expanding to evaluate outcomes after computer navigated and robotic assisted TKA. Patient improvement after TKA affects patient satisfaction¹. One such physical measure is the Timed Up and Go (TUG) test, which is used to evaluate function, mobility, and balance². The goal of this study was to assess the association between TUG test and PROs following robotic assisted TKA.

METHODS:

The study was approved by the Institutional Review Board. Sixty patients that underwent robotic assisted total knee arthroplasty (rTKA) performed by a single surgeon using one robotic platform (ROSA Knee System) were prospectively evaluated after informed consent. Demographic and clinical data were collected through an online internet-based data collection platform. PROs were collected prior to surgery, and at 1, 3, and 12 months (±2 months) after surgery. Joint-specific PROs collected included the 12-item Knee Injury and Osteoarthritis Outcome Score (KOOS-12) with separate scores for Pain (KOOS-12 Pain), Activity of Daily Living (KOOS-12 ADL), Quality of Life (KOOS-12 QOL), and KOOS-12 Total Scores. The 7-item KOOS JR was derived from the KOOS-12. The Veterans Rand health survey (VR-12) was the global PRO used. The International Society of Arthroplasty Registries (ISAR) patient satisfaction question was used to measure patient satisfaction post-operatively. The TUG test was performed by physical therapists and nurses in the Joint Replacement Center and is reported as the total time taken to perform the following tasks: stand from a seated position, walk 10 feet, turn around, walk back 10 feet, turn back around, and sit from a standing position. PROMs and TUG test data were collected pre-operatively, immediately post-operatively before leaving the hospital, 1 month, 3 months, and 12 months post-operatively. Patients who required assistive devices such a cane or walker were excluded from analysis. In total, 60 patients had pre-operative TUG scores, 12-month post-operative TUG scores, and matched PROMs at the pre-operative and 12-month time points. Descriptive analyses were performed on demographic data, baseline PROM scores, and 12-month PROM scores. The change in PROM scores as well as the change in TUG scores were also collected. Pearson correlation was conducted to determine the association between TUG scores and PRO measures. A multivariate linear regression model with 95% confidence interval was used to identify whether the TUG is a significant predictor of 12-month PROs. Statistical significance was set at $p < 0.05$ and 95% confidence limits.

RESULTS:

Figure 1 illustrates how mean TUG scores change over time from pre-operative score to TUG score at 12 months post-TKA. Of the 60 patients with pre-operative and 12-month TUG scores and PRO measures, 45% (27) were female and 55% (22) were male. Mean age was 70.5 years (SD 6.5) and mean BMI was 31.2 (SD 5.0). Pearson correlation (Table 1) demonstrated that TUG score improvement (defined as the change in TUG score) was significantly associated with improvement in KOOS-12 QOL ($p = 0.00251$), Summary Score ($p = 0.0337$), and KOOS-JR ($p=0.0479$). Multivariate regression (Table 2) showed that improved TUG score is a statistically significant, independent predictor of 12-month improvement of KOOS-12 QOL ($-2.8, p = 0.0229$; CI [-5.3 – -0.4]).

DISCUSSION:

TKA is an extremely successfully operation and improvements were observed in both TUG scores and PRO scores 12 months after rTKA. TUG scores approach their pre-operative score by 1 month post-operatively and by 12 months post-operatively demonstrate improved scores compared to baseline. TUG scores were associated with 12-month improvement of KOOS-12 QOL and Summary scores. TUG scores did not show a significant association with KOOS-12 Pain or ADL scores based on our preliminary data.

SIGNIFICANCE/CLINICAL RELEVANCE:

Functional performance following rTKA as measured by TUG score is a predictor of improvement in patient reported quality of life one year after rTKA.

REFERENCES:

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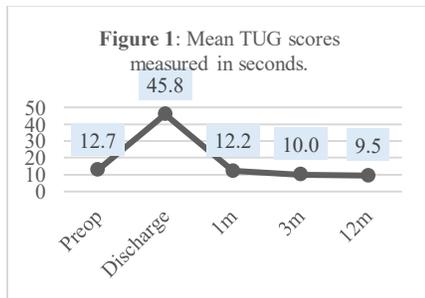


Table 1: Pearson Correlation between 12-Month Change in TUG and 12-Month Change in PRO

	Coefficient	P value
KOOS12 QOL	-0.29923	0.0251
KOOS12 ADL	-0.23653	0.0792
KOOS12 Pain	-0.23139	0.0862
KOOS12 Summary Score	-0.28432	0.0337
KOOS-JR	-0.26798	0.0479

Table 2: Multivariate Linear Regression Model to Predict 12-Month Change in KOOS12 QOL Score

	Coefficient	P-value	95% Confidence Limits	
Intercept	19.9	0.7201	-91.4	131.2
Age in years	0.2	0.6565	-0.9	1.4
BMI	1.7	0.0264	0.2	3.2
Back Pain: None (Reference)		0.1788		
Mild	-11.9		-26.6	2.8
Moderate	-13.1		-30.7	4.5
Severe	-33.8		-79.6	11.9
MCS - Global Mental Health Score	-0.9	0.0142	-1.5	-0.2
12 Month Change in TUG	-2.8	0.0229	-5.3	-0.4