Effect of Posterior Stabilized Versus Cruciate Retaining Total Knee Arthroplasty on Acute Postoperative Mobility

Benjamin G Fiedler, Thomas R Bieganowski[1], Utkarsh Anil[1], Charles Chun-Ting Lin[2], Ivan Fernandez-Madrid[3], Joshua Craig Rozell, Ran Schwarzkopf[4]
[1]NYU Langone Health, [2]NYU Langone Health, Department of Orthopedic Surge, [3]NYU Langone Orthopedic Hospital, [4]NYU Langone Orthopedic Hospital, Hospital For Joi

INTRODUCTION:
The impact of posterior stabilized (PS) versus cruciate retaining (CR) implants on immediate postoperative mobility following primary total knee arthroplasty (TKA) remains unclear. Therefore, the goal of the present analysis was to determine the impact of TKA with a PS or CR implant on Activity Measure for Post-Acute Care (AM-PAC) "6-Clicks" basic mobility scores within the acute postoperative period.
METHODS:
This was a retrospective review of all patients who underwent a primary TKA with either a PS or CR implant from January 2018 to April 2021. Patients from each group were matched using propensity score matching in a 1:1 ratio with a caliper of 0.01. Within the PS group, patients were further stratified based on whether they received a constrained or non-constrained liner. All patients included in the analysis had completed AM-PAC scores within 48 hours postoperatively. Chi-squared analysis and independent samples t-tests were used to compare the two groups. Alpha was set at 0.05.
RESULTS:
In total, 932 patients with a PS implant were propensity score matched 1:1 to those who had a CR implant. There were no significant differences between any demographic variables following matching. There was no statistically significant difference in overall AM-PAC scores (p=0.841) between the two groups. Subgroup analysis within the PS group similarly demonstrated no statistically significant differences in overall AM-PAC scores (p=0.489) nor 90-day MUA rates (p=0.819) between the constrained and non-constrained polyethylene liner subgroups.
DISCUSSION AND CONCLUSION:
The present analysis demonstrates that PS and CR implants afford patients with similar mobility in the early postoperative period. Patients undergoing PS TKA did not experience a significant difference in postoperative mobility despite varying degrees of liner constraint.

Table 1. Demographics

	Unmatched			Matched		
	CR (n=937)	PS (n=2413)	P-Value	CR (n=932)	PS (n=932)	P-Value
Sex			<0.001			0.423
Male	301 (32.1%)	630 (26.1%)		298 (32.0%)	282 (30.3%)	
Female	636 (67.9%)	1783 (73.9%)		634 (68.0%)	650 (69.7%)	
Age (y, ± SD)	66.93 ± 9.05	66.78 ± 9.57	0.683	66.95 ± 9.05	66.55 ± 9.58	0.363
Smoking Status			0.511			0.572
Never Smoker	535 (57.1%)	1429 (59.2%)		533 (57.2%)	555 (59.5%)	
Former Smoker	346 (36.9%)	841 (34.9%)		345 (37.0%)	328 (35.2%)	
Current Smoker	56 (6.0%)	143 (5.9%)		54 (5.8%)	49 (5.3%)	
Race			0.006			0.547
White	474 (50.6%)	1295 (53.7%)		471 (50.5%)	468 (50.2%)	
Black or African American	161 (17.2%)	483 (20.0%)		161 (17.3%)	183 (19.6%)	
Asian	54 (5.8%)	112 (4.6%)		54 (5.8%)	48 (5.2%)	
Other	248 (26.5%)	523 (21.7%)		246 (26.4%)	233 (25.0%)	
CCI (± SD)	4.68 ± 2.37	4.35 ± 2.12	<0.001	4.62 ± 2.23	4.52 ± 2.34	0.315
BMI (kg/m², ± SD)	32.02 ± 6.15	33.00 ± 6.49	<0.001	32.04 ± 6.15	32.07 ± 5.88	0.925

Table 2. Comparison of Perioperative Outcomes

	CR (n=932)	PS (n=932)	P-Value
90-Day MUA	28 (3.0%)	23 (2.5%)	0.478
AM-PAC Overall Score	18.60 ± 3.24	18.57 ± 3.25	0.841
Turning Over	3.42 ± 0.59	3.39 ± 0.57	0.341
Lying to Sitting	3.29 ± 0.59	3.30 ± 0.58	0.635
Sitting to Standing	3.12 ± 0.57	3.13 ± 0.54	0.531
Bed to Chair	3.10 ± 0.56	3.10 ± 0.56	0.836
Need to Walk	3.02 ± 0.58	3.02 ± 0.62	0.969
Steps 3 to 5	2.66 ± 0.90	2.62 ± 0.93	0.350