

Is Outpatient Revision Total Knee Arthroplasty Safe? An Analysis of 3,572 Outpatient Aseptic Revision Procedures

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INTRODUCTION:

Outpatient primary total knee arthroplasty (TKA) has been well-established as a safe and effective procedure; however, the safety of outpatient revision TKA (rTKA) remains unclear. Therefore, this study utilized a large database to compare outcomes between outpatient and inpatient rTKA.

METHODS: A large insurance database was queried to identify patients undergoing rTKA during 2010-2020. Patients with diagnosis codes related to periprosthetic joint infection (PJI) were excluded. Outpatient surgery was defined as length of stay < 24 hours. Cohorts were matched by age, sex, Elixhauser Comorbidity Index (ECI), comorbidities (diabetes, obesity, and tobacco use), and components revised (one- vs. two-component). Medical complications at 90-days and surgical complications at 1- and 2-years postoperatively were evaluated through multivariate logistic regression.

RESULTS: A total of 7,144 aseptic rTKAs were included. There were no significant differences in patient characteristics or procedure type between groups. There was a lower risk of PJI (Odds Ratio [OR]: 0.594, 95% Confidence Interval [95% CI]: 0.419-0.833; $p=0.003$), deep vein thrombosis (DVT) (OR: 0.611, 95% CI: 0.429-0.862; $p=0.006$), wound dehiscence (OR: 0.526, 95% CI: 0.366-0.757; $p<0.001$), transfusion (OR: 0.448, 95% CI: 0.203-0.918; $p=0.035$), and any complication (OR: 0.831, 95% CI: 0.730-0.945; $p=0.005$) at 90-days postoperatively for the outpatient cohort. At both 1-year and 2-years postoperatively, outpatient rTKA patients had a lower incidence of periprosthetic fracture (OR: 0.473, 95% CI: 0.306-0.715; $p<0.001$ and OR: 0.491, 95% CI: 0.334-0.710; $p<0.001$, respectively) and all-cause revision (OR: 0.795, 95% CI: 0.642-0.982; $p=0.033$ and OR: 0.783, 95% CI: 0.653-0.938; $p=0.008$, respectively).

DISCUSSION AND CONCLUSION: Our findings suggests that rTKA can be safely performed on an outpatient basis in appropriately selected patients without an increased risk of adverse events relative to inpatient rTKA. However, we could not ascertain case complexity in either cohort, and despite controlling for several potential confounders, other less tangible differences could exist between groups.

Table 1. Demographics of included patients before and after matching.

	Unmatched		Matched	
	Outpatient rTKA	Inpatient rTKA	Outpatient rTKA	Inpatient rTKA
N	4,666	3,572	3,572	3,572
Women*	2,591 (55.53)	14,829 (65.93)	2,106 (58.96)	2,106 (58.96)
Age (Mean ± SD)	63.76 ± 9.52	64.21 ± 9.49	63.98 ± 8.69	64.00 ± 8.71
ECI (Mean ± SD)	5.54 ± 3.33	5.96 ± 3.45	5.42 ± 3.00	5.43 ± 3.00
Revision Type*				
One-Component	2,409 (51.63)	9,673 (43.01)	1,713 (47.96)	1,719 (48.12)
Two-Component	2,257 (48.37)	12,824 (57.02)	1,859 (52.04)	1,853 (51.88)
Comorbidity*				
Diabetes	1,104 (23.66)	4,059 (18.05)	762 (21.33)	742 (20.77)
Obesity	1,146 (24.56)	2,531 (11.31)	887 (24.82)	899 (25.17)
Tobacco Use	1,110 (23.80)	6,862 (30.94)	911 (25.49)	995 (27.86)

Table 2. Adverse Events Within 90-Days Between Outpatient and Inpatient Revision TKA.

Adverse Event	Outpatient rTKA	Inpatient rTKA	p-value	OR (95% CI)	Adjusted p-value
Superficial Surgical Site Infection	41 (1.15)	59 (1.65)	0.087	0.679 (0.448-1.016)	0.063
Periprosthetic Joint Infection	54 (1.51)	91 (2.55)	0.003	0.594 (0.419-0.833)	0.003
Deep Vein Thrombosis	53 (1.48)	87 (2.44)	0.005	0.611 (0.429-0.862)	0.006
Pulmonary Embolism	16 (0.45)	25 (0.70)	0.011	0.611 (0.254-0.794)	0.008
Acute Kidney Injury	45 (1.26)	50 (1.41)	0.650	0.941 (0.624-1.415)	0.769
Wound Dehiscence	32 (1.46)	91 (2.55)	0.001	0.526 (0.366-0.747)	<0.001
Transfusion	40 (1.12)	41 (1.15)	0.880	0.931 (0.593-1.459)	0.755
Pneumonia	25 (0.7)	34 (0.95)	0.256	0.764 (0.458-1.279)	0.309
Transfusion	11 (0.31)	23 (0.64)	0.059	0.448 (0.203-0.918)	0.035
Urinary Tract Infection	108 (3.02)	122 (3.42)	0.384	0.859 (0.655-1.134)	0.269
Resepsion	83 (2.32)	88 (2.46)	0.737	0.792 (0.571-1.089)	0.153
30 Day Visit	116 (3.25)	131 (3.70)	0.792	0.844 (0.726-1.226)	0.665
Readmission	155 (4.34)	175 (4.92)	0.284	0.923 (0.653-1.333)	0.694
Any Complication	529 (14.51)	603 (16.88)	0.018	0.831 (0.730-0.945)	0.005

Table 3. Revision Rates and Outcomes at 1-Year and 2-Years Post-Operatively Between Outpatient and Inpatient rTKA.

1-Year Complications	Outpatient rTKA	Inpatient rTKA	p-value	OR (95% CI)	Adjusted p-value
Periprosthetic Fracture	34 (0.95)	69 (1.93)	<0.001	0.473 (0.306-0.715)	<0.001
Periprosthetic Joint Infection	24 (0.67)	39 (1.09)	0.076	0.632 (0.374-1.045)	0.078
Aseptic Loosening	59 (1.65)	47 (1.32)	0.282	0.941 (0.619-1.427)	0.775
Manipulation Under Anesthesia	101 (2.83)	126 (3.47)	0.136	0.796 (0.605-1.040)	0.065
Patella Resurfacing	3 (0.08)	4 (0.11)	1.000	0.773 (0.153-3.517)	0.756
Any Revision	200 (5.6)	206 (5.77)	0.798	0.795 (0.642-0.982)	0.033
2-Year Complications					
Periprosthetic Fracture	43 (1.2)	85 (2.38)	<0.001	0.491 (0.334-0.710)	<0.001
Periprosthetic Joint Infection	32 (0.9)	59 (1.6)	0.059	0.658 (0.417-1.022)	0.066
Aseptic Loosening	81 (2.27)	88 (2.46)	0.640	0.697 (0.498-0.969)	0.033
Manipulation Under Anesthesia	118 (3.3)	140 (3.92)	0.183	0.819 (0.635-1.055)	0.123
Patella Resurfacing	4 (0.11)	11 (0.31)	0.121	0.724 (0.104-5.096)	0.093
Any Revision	273 (7.64)	293 (8.2)	0.005	0.783 (0.653-0.938)	0.008