



Traumatic Arthritis Increases Total Knee Arthroplasty Complication Rates

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Background

Total knee arthroplasty (TKA) is one of the most common elective surgical procedures in the United States. TKA has proven successful in treating primary osteoarthritis (OA), but less is known about complications following surgery for post-traumatic arthritis (PTA). The aim of this study is to assess postoperative complication rates after TKA performed for PTA compared with primary OA.

Methods

The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database from 2008 to 2016 was queried. Patients were identified using the CPT code for TKA and the diagnosis codes for primary OA and PTA. Univariate and bivariate statistics were performed. Multivariate and propensity-matched logistic regression analyses were performed.

Table 1. Comparison of continuous variables among the primary TKA population.

	TKA for Osteoarthritis			TKA for Post-traumatic arthritis			P Value*
	OA TKA, n	Mean ± SD	95% CI	PTA TKA, n	Mean ± SD	95% CI	
Operative time, min	217,110	92.7 ± 37.21	92.55 – 92.86	1,712	113.7 ± 46.11	111.51 - 115.88	<0.0001
Age, years	216,110	66.73 ± 9.49	66.69 – 66.77	1,711	59.3 ± 10.68	58.79 - 59.81	<0.0001
LOS, days	215,390	3 ± 3.21	2.99 – 3.01	1,698	2.83 ± 2.89	2.69 - 2.96	0.027
BMI, kg/m ²	216,449	33.05 ± 6.98	33.03 – 33.08	1,710	31.48 ± 6.6	31.16 - 31.79	<0.0001

*P value represents t-test value comparing post-traumatic arthritis with osteoarthritis control group. (LOS = Length of Stay, BMI = Body Mass Index).

Table 2. Univariate analyses of primary TKA postoperative complications and secondary outcomes.

	Overall (n [%])	OATKA (n [%])	PTATKA (n [%])	P Value*
Death or serious morbidity	17,750 (8.38)	17,614 (8.39)	136 (8.09)	0.659
Death	233 (0.11)	232 (0.11)	1 (0.06)	0.540
Serious morbidity	17,690 (8.35)	17,554 (8.36)	136 (8.09)	0.689
Surgical site infection	15 (0.01)	15 (0.01)	0 (0)	0.728
Respiratory	339 (0.15)	337 (0.16)	2 (0.12)	0.687
Cardiac	3,740 (1.71)	3,710 (1.71)	30 (1.75)	0.890
Bleeding (requiring transfusion)	14,066 (6.43)	13,957 (6.43)	109 (6.37)	0.918
Sepsis	441 (0.20)	437 (0.20)	4 (0.23)	0.766
Long operative time (1 SD > Mean)	26,703 (12.2)	26,225 (12.08)	478 (27.92)	<0.001
Total length of stay > 5 days	16,034 (7.33)	15,909 (7.33)	125 (7.3)	0.968
Discharged to home	152,126 (74.3)	150,760 (74.23)	1,366 (83.24)	<0.001
Readmission within 30 days	6,824 (3.37)	6,752 (3.36)	72 (4.39)	0.021
Required reoperation	2,400 (1.17)	2,356 (1.16)	44 (2.68)	<0.001

*P value represents Chi-square value comparing post-traumatic arthritis group with the osteoarthritis control group.

Table 3. Summary of propensity-matched logistic regression of postoperative complications and secondary outcomes.

	OR	95% CI	P Value*
Death or serious morbidity	1.05	0.80 – 1.36	0.738
Death	1.00	0.06 – 16.00	1.000
Serious morbidity	1.04	0.80 – 1.36	0.738
Length of stay > 5 days	1.44	1.05 – 1.98	0.022
Reoperation	2.63	1.47 – 4.71	0.001
Readmission	1.52	1.04 – 2.23	0.031
Discharge home	1.29	1.08 – 1.56	0.006

*P value represents propensity score-matched logistic regression analysis comparing post-traumatic arthritis group with osteoarthritis control group.

Results

Analyses included 218,838 patients undergoing TKA. TKA for OA comprised 217,126 (99.2%) cases, while 1,712

(0.78%) TKA cases for PTA were identified. Propensity matching identified 1,516 OA and PTA patient pairs. Mean operative time in the PTA group was 114 minutes, compared with 93 minutes in the OA group. Patients in the PTA group were significantly younger (59.3 years) than OA patients (66.7 years) and had lower body mass index (BMI) (31.5 vs. 33.1 kg/m²). Propensity-matched analysis demonstrated 2.5-times increased risk of reoperation, 52% increased risk for readmission, and 29% increased likelihood of discharge to home postoperatively for PTA compared with OA patients. There was no significant difference in death within 30 days or medical morbidity between groups.

Conclusion

Compared with primary OA patients, PTA patients undergoing TKA are much more likely to have a prolonged operative time, and require reoperation or readmission within 30 days. They are not at increased risk of death within 30 days or major medical morbidity. Surgeons should perform adequate preoperative planning to minimize need for these complications, and counsel PTA patients on these risks.