

# No Difference in Postoperative Complications between Simultaneous and Staged, Bilateral Unicompartmental Knee Arthroplasty

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## INTRODUCTION:

The safe timing of contralateral surgery following unicompartmental knee arthroplasty (UKA) remains unknown. Therefore, the objective of this study was to examine the differences in postoperative complications in patients undergoing unilateral, simultaneous, and staged bilateral UKA.

## METHODS:

A large insurance administrative claims database was queried for patients undergoing UKA between 2015-2020. Patients undergoing unilateral UKA were matched in a 1:1 fashion based on age, gender, Elixhauser Comorbidity Index (ECI), obesity, diabetes, and smoking status to patients undergoing simultaneous bilateral UKA, bilateral UKA staged 1-90 days, and bilateral UKA staged 91-365 days. Univariate and multivariate analyses were performed to examine the impact of timing of bilateral procedures on 90-day postoperative complications relative to patients who underwent unilateral UKA. Outcomes were considered significant at  $p < 0.05$ .

## RESULTS:

A total of 9,638 patients undergoing UKA were included in the final analysis, of which 5,672 (58.9%) were unilateral, 396 (4.1%) were simultaneous bilateral, 1,496 (15.5%) were bilateral staged between 1-90 days, and 2,074 (21.5%) were bilateral staged between 91-365 days. Univariate analysis identified no significant differences in complications between matched groups except for an increased incidence of wound dehiscence among patients who underwent simultaneous bilateral UKA (0.0% vs. 2.1%,  $p=0.040$ ) compared to unilateral UKA. However, multivariate analysis demonstrated that simultaneous or staged bilateral UKA at either time point did not increase the risk of any postoperative complication relative to unilateral surgery.

## DISCUSSION AND CONCLUSION:

Bilateral UKA can be performed simultaneously or in a staged fashion without increasing the risk of the studied 90-day complications relative to unilateral UKA.

**Table 1. Patient demographics of matched cohorts**

	Unilateral	Simultaneous	Staged 1-90 Days	Staged 91-365 Days	p value
N	5622	396	1496	2074	
Female	3061 (54.3%)	164 (41.4%)	662 (44.3%)	1346 (64.9%)	<0.001
Age	63.5 ± 10.4	62.8 ± 9.2	62.1 ± 9.9	62.2 ± 9.4	<0.001
ECI	4.76 ± 3.18	3.81 ± 2.01	3.93 ± 2.29	4.25 ± 3.08	<0.001
Comorbidities					
Tobacco Use	651 (11.6%)	36 (9.1%)	144 (9.6%)	407 (19.6%)	<0.001
Diabetes	1029 (18.3%)	41 (10.3%)	287 (19.2%)	414 (20.0%)	<0.001
Obesity	3077 (54.7%)	214 (54.0%)	422 (28.2%)	424 (20.4%)	<0.001

**Table 2. Patient demographics of matched cohorts**

	Simultaneous		Staged 1-90 days		Staged 91-365 days		
	Unilateral	Bilateral	Unilateral	Bilateral	Unilateral	Bilateral	p
N	28	28	28	28	100	100	
Female	14 (50.0%)	14 (50.0%)	17 (60.7%)	17 (60.7%)	69 (69.0%)	69 (69.0%)	1.000
Age	64.2 ± 9.2	63.1 ± 9.1	64.7 ± 9.9	64.7 ± 9.8	64.9 ± 9.8	64.9 ± 9.8	0.998
ECI	3.77 ± 2.17	3.77 ± 2.17	3.77 ± 2.17	3.77 ± 2.17	3.69 ± 2.41	3.69 ± 2.41	1.000
Comorbidities							
Tobacco Use	14 (50.0%)	14 (50.0%)	18 (64.3%)	18 (64.3%)	147 (147.0%)	147 (147.0%)	1.000
Diabetes	13 (46.4%)	13 (46.4%)	18 (64.3%)	18 (64.3%)	117 (117.0%)	117 (117.0%)	1.000
Obesity	18 (64.3%)	18 (64.3%)	18 (64.3%)	18 (64.3%)	27 (27.0%)	27 (27.0%)	1.000

**Table 3. Univariate analysis of the complications after the second UKA within the matched cohorts**

	Simultaneous		Staged 1-90 days		Staged 91-365 days		
	Unilateral	Bilateral	Unilateral	Bilateral	Unilateral	Bilateral	p
Septic arthritis	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
UTI	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	0.627
Postoperative Pain	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
UTI	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
Cardiac Arrest	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
Respiratory Failure	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
Stroke	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
Myocardial Infarction	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
Deep Vein Thrombosis	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
Pneumonia	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
Septic Shock	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
Acute Kidney Injury	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000
Other Post-Operative Complications	4 (0.0%)	1 (0.7%)	4 (0.0%)	1 (0.7%)	4 (0.0%)	4 (0.2%)	1.000

**Table 4. Multivariate analysis of postoperative complications after the second UKA. All values are reported relative to unilateral UKA.**

	OR	95% CI	p
Septic arthritis	0.8	0.01-10.7	0.92
UTI	1.1	0.01-14.7	0.97
Postoperative Pain	0.8	0.01-10.7	0.97
UTI	1.1	0.01-14.7	0.97
Cardiac Arrest	0.8	0.01-10.7	0.97
Respiratory Failure	0.8	0.01-10.7	0.97
Stroke	0.8	0.01-10.7	0.97
Myocardial Infarction	0.8	0.01-10.7	0.97
Deep Vein Thrombosis	0.8	0.01-10.7	0.97
Pneumonia	0.8	0.01-10.7	0.97
Septic Shock	0.8	0.01-10.7	0.97
Acute Kidney Injury	0.8	0.01-10.7	0.97
Other Post-Operative Complications	0.8	0.01-10.7	0.97

ECI, Elixhauser Comorbidity Index; Values reported as % (CI) or mean ± standard deviation

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