Prior Coronary Angiography and Stent Placement Prior to Total Joint Arthroplasty: Associations with Postoperative Complications and Surgical Timing

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INTRODUCTION: Prior coronary angiography (CAG) is increasingly common among patients undergoing for total joint arthroplasty (TJA) due to the rising prevalence of coronary artery disease in the aging population. Yet, it remains unclear whether a history of CAG affects postoperative complication rates after total knee arthroplasty (TKA) or total hip arthroplasty (THA), and whether the timing between CAG and surgery mitigates risk. This study therefore asked: (1) Do patients with prior CAG (stent or non□stent) experience higher 90□day complication rates after TKA or THA compared to matched controls? (2) Within the CAG cohort, does stent placement further elevate these risks? (3) Does the interval between CAG and arthroplasty influence postoperative complications?

METHODS:

Using the PearlDiver Patient Records Database (2010–2022), we identified adult patients who underwent primary TKA or THA between 2012 and 2020, with at least 3 years of continuous insurance enrollment prior to surgery and at least 2 years of follow-up afterward. Each group was 1:1 propensity score–matched with controls without CAG based on age, sex, Charlson Comorbidity Index (CCI), obesity, diabetes, tobacco use, alcohol abuse, drug abuse, and year of surgery. Within each matched cohort, patients were subdivided by the interval from most recent CAG to arthroplasty. Primary outcomes were 90-day rates of readmission, blood transfusion (within 10 days), MI, CVA, venous thromboembolism (VTE), surgical site infection (SSI), 90-day PJI, and acute renal failure (ARF). Secondary outcomes were 2-year PJI and revision rates. Multivariate logistic regression estimated adjusted odds ratios (OR) with 95% confidence intervals.

RESULTS:

Among 4 602 stent-CAG TKA patients and 4 602 matched controls, stent-CAG was associated with significantly higher 90-day rates of readmission (OR 1.27, P = 0.004), blood transfusion (OR 1.42, P = 0.026), MI (OR 9.77, P < 0.001), CVA (OR 1.62, P < 0.001), and ARF (OR 1.24, P = 0.050). No significant differences occurred in VTE, SSI, 90-day PJI, 2-year PJI, or 2-year revision (all P > 0.05). Within the stent-CAG TKA cohort, delaying surgery beyond six months modestly reduced VTE and ARF rates but did not attenuate MI risk at any interval. Among 25 514 non-stent-CAG TKA patients and 25 514 matched controls, non-stent CAG was linked to higher readmission (OR 1.22, P < 0.001), blood transfusion (OR 1.22, P < 0.001), MI (OR 2.54, P < 0.001), CVA (OR 1.29, P < 0.001), VTE (OR 1.18, P < 0.001), SSI (OR 1.15, P = 0.021), and ARF (OR 1.16, P = 0.002), whereas 90-day PJI was slightly lower (OR 0.85, P = 0.018) and 2-year PJI and revision rates did not differ. Timing analyses showed that delaying TKA beyond six months reduced SSI and VTE but did not normalize MI risk at any interval.

Among 3 422 stent-CAG THA patients and 3 422 matched controls, stent-CAG was associated with higher 90-day rates of blood transfusion (OR 1.31, P = 0.047), MI (OR 6.37, P < 0.001), and CVA (OR 1.88, P < 0.001). Readmission, VTE, SSI, 90-day PJI, 2-year PJI, and 2-year revision rates did not differ (all P > 0.05). Within the stent-CAG THA cohort, postponing surgery beyond six months modestly lowered VTE and ARF but did not reduce MI risk. Among 14 728 non-stent-CAG THA patients and 14 728 matched controls, non-stent CAG patients had higher readmission (OR 1.19, P < 0.001), blood transfusion (OR 1.28, P < 0.001), MI (OR 2.40, P < 0.001), CVA (OR 1.37, P < 0.001), VTE (OR 1.20, P = 0.007), and ARF (OR 1.18, P = 0.010). SSI, 90-day PJI, 2-year PJI, and 2-year revision rates did not differ. Delaying THA beyond six months reduced VTE (OR 1.22, P = 0.042) but did not normalize MI risk.

DISCUSSION AND CONCLUSION:

A history of coronary angiography, particularly with stenting, is associated with increased cardiovascular and systemic complications following both TKA and THA, without a corresponding rise in surgical site infections or revision rates. While certain non-cardiac outcomes such as VTE and ARF appear modifiable with longer intervals between CAG and surgery, the elevated risk of MI persists regardless of timing. These findings highlight the importance of preoperative risk assessment in patients with prior CAG undergoing TJA and may inform shared decision-making regarding surgical timing and medical optimization.

Table 1. Comparison of Complication and Outcome Rates After Total Knee Arthroplasty Between Patients who had prior Stent CAG history and Matched Controls, and Evaluation of Timing Impact Using Multivariate Analysis

Variables	Patients who had Prior Stent CAG	Matched Control Group	OR [95% CI]	P-value	Within 6 months Before TKA			Within 6-12 months Before TKA			Within 12-18 months Before TKA			Within 18-24 months Before TKA			Within 24-36 months Before TKA		
					No. of CAG patients	OR [95% CI]	P-value	No. of CAG patients	OR [95% CI]	P-value	No. of CAG patients	OR [95% CI]	P-value	No. of CAG patients	OR [95% CI]	P-value	No. of CAG patients	OR [95% CI]	P-value
Readmission [90 days]	367 [7.97%]	299 [6.5%]	1.273 [1.083 - 1.498]	**0.004**	35 (10.32%)	1.604 [1.070 - 2.336]	**0.017**	77 (9.38%)	1.475 [1.116 - 1.927]	**0.005**	102 (8.11%)	1.286 [1.008 - 1.627]	**0.04**	69 (8.06%)	1.252 [0.936 - 1.651]	0.12	84 (6.33%)	1.013 [0.776 - 1.309]	0.925
Blood Transfusion [10 days]	99 [2.15%]	75 [1.63%]	1.422 [1.044 - 1.945]	**0.026**	21 (6.19%)	2.531 [1.434 - 4.293]	**0.001**	21 (2.56%)	1.549 [0.911 - 2.528]	0.091	29 (2.31%)	1.382 [0.872 - 2.135]	0.155	11 (1.29%)	0.851 [0.408 - 1.597]	0.64	17 (1.28%)	1.191 [0.664 - 2.034]	0.538
Myocardial Infarction [90 days]	118 [2.56%]	14 [0.3%]	9.772 [5.756 - 17.972]	**<0.001**	13 (3.83%)	14.592 [6.324 - 33.656]	**<0.001**	26 (3.17%)	11.437 [5.924 - 23.032]	**<0.001**	27 (2.15%)	7.702 [4.051 - 15.319]	**<0.001**	24 (2.8%)	10.738 [5.443 - 22.059]	**<0.001**	28 (2.11%)	9.902 [4.950 - 21.313]	**<0.001**
Cerebrovascular Accident [90 days]	181 [3.93%]	129 [2.8%]	1.622 [1.280 - 2.061]	**<0.001**	17 (5.01%)	2.158 [1.219 - 3.604]	**0.005**	28 (3.41%)	1.386 [0.889 - 2.088]	0.133	66 (5.25%)	2.141 [1.558 - 2.919]	**<0.001**	23 (2.69%)	0.966 [0.586 - 1.518]	0.887	47 (3.54%)	1.448 [1.010 - 2.046]	**0.039**
Venous Thromboembolism [90 days]	149 [3.24%]	191 [4.15%]	0.812 [0.650 - 1.012]	0.065	19 (5.6%)	1.176 [0.681 - 1.919]	0.538	24 (2.92%)	0.725 [0.456 - 1.100]	0.149	32 (2.54%)	0.639 [0.428 - 0.924]	**0.022**	38 (4.44%)	1.116 [0.765 - 1.587]	0.555	36 (2.71%)	0.718 [0.490 - 1.025]	0.078
Surgical Site Infection [90 days]	92 [2.0%]	90 [1.96%]	1.075 [0.797 - 1.450]	0.635	* (0%)	1.227 [0.578 - 2.345]	0.563	12 (1.46%)	0.683 [0.349 - 1.224]	0.23	23 (1.83%)	0.850 [0.519 - 1.336]	0.497	23 (2.69%)	1.612 [0.981 - 2.549]	**0.049**	24 (1.81%)	1.222 [0.738 - 1.953]	0.418
Periprosthetic Joint Infection [90 days]	86 [1.87%]	95 [2.06%]	0.927 [0.685 - 1.252]	0.62	11 (3.24%)	1.863 [0.918 - 3.436]	0.062	20 (2.44%)	1.261 [0.746 - 2.031]	0.362	25 (1.99%)	0.982 [0.613 - 1.516]	0.935	13 (1.52%)	0.689 [0.356 - 1.217]	0.231	17 (1.28%)	0.595 [0.335 - 0.993]	0.06
Periprosthetic Joint Infection [2 years]	147 [3.19%]	164 [3.56%]	0.918 [0.729 - 1.156]	0.469	14 (4.13%)	1.219 [0.655 - 2.097]	0.503	27 (3.29%)	0.957 [0.615 - 1.435]	0.839	38 (3.02%)	0.859 [0.590 - 1.220]	0.41	28 (3.27%)	0.912 [0.588 - 1.362]	0.667	40 (3.01%)	0.851 [0.583 - 1.213]	0.387
Acute Renal Failure [90 days]	194 [4.22%]	176 [3.82%]	1.242 [1.001 - 1.544]	**0.05**	14 (4.13%)	1.236 [0.667 - 2.119]	0.469	29 (3.53%)	0.925 [0.598 - 1.381]	0.715	62 (4.93%)	1.448 [1.063 - 1.951]	**0.017**	38 (4.44%)	1.244 [0.845 - 1.785]	0.252	51 (3.84%)	1.134 [0.804 - 1.572]	0.462
Revision Surgery [2 years]	126 [2.74%]	126 [2.74%]	0.984 [0.764 - 1.268]	0.902	11 (3.24%)	1.046 [0.512 - 1.932]	0.895	25 (3.05%)	1.114 [0.701 - 1.704]	0.633	33 (2.62%)	0.981 [0.653 - 1.435]	0.925	26 (3.04%)	1.077 [0.680 - 1.642]	0.74	31 (2.33%)	0.797 [0.517 - 1.191]	0.285

Values are reported as n [%]

***OR**: Odds Ratio; **CI**: Confidence Interval; **CAG**: Coronary Angiography; **TKA**: Total Knee Arthroplasty; **SSI**: Surgical Site Infection; **PJI**: Periprosthetic Joint Infection; **VTE**: Venous Thromboembolism; **MI**: Myocardial Infarction; **CVA**: Cerebrovascular Accident; **ARF**: Acute Renal Failure, *: Number of patients is less than 10.*

Table 2. Comparison of Complication and Outcome Rates After Total Hip Arthroplasty Between Patients with prior Stent CAG history and Matched Controls, and Evaluation of Timing Impact Using Multivariate Analysis

Variables	Patients with Prior Stent CAG	Matched Control Group	OR [95% CI]	P-value	Within 6 mo Before TKA			Within 6-12 mo Before TKA			Within 12-18 mo Before TKA			Within 18-24 mo Before TKA			Within 24-36 mo Before TKA		
					No. of CAG patients	OR [95% CI]	P-value	No. of CAG patients	OR [95% CI]	P-value	No. of CAG patients	OR [95% CI]	P-value	No. of CAG patients	OR [95% CI]	P-value	No. of CAG patients	OR [95% CI]	P-value
Readmission [90 days]	275 [8.04%]	235 [6.87%]	1.192 [0.990 - 1.435]	0.064	36 (8.76%)	1.300 [0.873 - 1.884]	0.179	59 (8.51%)	1.236 [0.901 - 1.670]	0.178	73 (8.22%)	1.206 [0.903 - 1.591]	0.195	40 (7.5%)	1.151 [0.794 - 1.628]	0.443	67 (7.47%)	1.081 [0.799 - 1.443]	0.604
Blood Transfusion [10 days]	135 [3.95%]	114 [3.33%]	1.308 [1.004 - 1.707]	**0.047**	28 (6.81%)	2.040 [1.276 - 3.164]	**0.002**	36 (5.19%)	1.631 [1.071 - 2.428]	**0.019**	26 (2.93%)	0.935 [0.584 - 1.443]	0.771	20 (3.75%)	1.241 [0.733 - 2.002]	0.397	25 (2.79%)	1.022 [0.629 - 1.598]	0.928
Myocardial Infarction [90 days]	90 [2.63%]	15 [0.44%]	6.371 [3.777 - 11.530]	**<0.001**	* (0%)	5.681 [2.392 - 12.915]	**<0.001**	26 (3.75%)	9.151 [4.832 - 17.955]	**<0.001**	16 (1.8%)	4.012 [1.929 - 8.345]	**<0.001**	14 (2.63%)	5.899 [2.727 - 12.613]	**<0.001**	24 (2.68%)	6.662 [3.446 - 13.385]	**<0.001**
Cerebrovascular Accident [90 days]	152 [4.44%]	91 [2.66%]	1.882 [1.435 - 2.482]	**<0.001**	26 (6.33%)	2.497 [1.530 - 3.948]	**<0.001**	32 (4.62%)	1.847 [1.178 - 2.822]	**0.006**	38 (4.28%)	1.951 [1.294 - 2.891]	**0.001**	24 (4.5%)	1.828 [1.107 - 2.909]	**0.014**	32 (3.57%)	1.456 [0.937 - 2.207]	0.085
Venous Thromboembolism [90 days]	91 [2.66%]	87 [2.54%]	1.082 [0.798 - 1.468]	0.611	* (0%)	0.837 [0.384 - 1.615]	0.624	21 (3.03%)	1.125 [0.657 - 1.833]	0.652	21 (2.36%)	0.938 [0.562 - 1.499]	0.798	16 (3.0%)	1.166 [0.641 - 1.982]	0.592	24 (2.68%)	1.187 [0.728 - 1.868]	0.473
Surgical Site Infection [90 days]	51 [1.49%]	47 [1.37%]	1.166 [0.777 - 1.752]	0.458	* (0%)	0.749 [0.250 - 1.799]	0.559	15 (2.16%)	1.614 [0.857 - 2.875]	0.119	11 (1.24%)	0.943 [0.458 - 1.782]	0.865	* (0%)	1.095 [0.447 - 2.306]	0.826	13 (1.45%)	1.294 [0.660 - 2.378]	0.427
Periprosthetic Joint Infection [90 days]	73 [2.13%]	81 [2.37%]	0.893 [0.643 - 1.238]	0.498	13 (3.16%)	1.280 [0.647 - 2.321]	0.445	17 (2.45%)	0.939 [0.523 - 1.587]	0.824	12 (1.35%)	0.584 [0.300 - 1.042]	0.088	13 (2.44%)	1.052 [0.538 - 1.883]	0.873	18 (2.01%)	0.931 [0.535 - 1.538]	0.789
Periprosthetic Joint Infection [2 years]	105 [3.07%]	127 [3.71%]	0.836 [0.638 - 1.092]	0.19	19 (4.62%)	1.257 [0.723 - 2.063]	0.39	21 (3.03%)	0.760 [0.454 - 1.209]	0.269	23 (2.59%)	0.740 [0.457 - 1.146]	0.196	20 (3.75%)	1.080 [0.637 - 1.736]	0.763	22 (2.45%)	0.715 [0.437 - 1.118]	0.16
Acute Renal Failure [90 days]	132 [3.86%]	129 [3.77%]	1.145 [0.885 - 1.482]	0.304	16 (3.89%)	1.166 [0.651 - 1.956]	0.582	31 (4.47%)	1.223 [0.783 - 1.849]	0.356	38 (4.28%)	1.324 [0.896 - 1.914]	0.146	19 (3.56%)	0.970 [0.564 - 1.576]	0.907	28 (3.12%)	0.915 [0.587 - 1.380]	0.681
Revision Surgery [2 years]	81 [2.37%]	85 [2.48%]	0.946 [0.692 - 1.292]	0.728	* (0%)	0.757 [0.331 - 1.504]	0.465	20 (2.89%)	1.113 [0.657 - 1.798]	0.675	18 (2.03%)	0.832 [0.481 - 1.365]	0.488	12 (2.25%)	0.990 [0.508 - 1.763]	0.974	21 (2.34%)	1.034 [0.617 - 1.660]	0.894

Values are reported as n [%]

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