Impact of Preoperative Platelet Count on Readmission and Reoperation Following Total Hip Arthroplasty: A Retrospective Cohort Analysis Using the ACS NSQIP Database

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INTRODUCTION: Total hip arthroplasty (THA) is a common orthopedic procedure, yet factors influencing readmission and reoperation rates remain unclear. Abnormal platelet counts may reflect underlying systemic inflammation or coagulopathy that predispose patients to complications. Prior studies suggest platelet abnormalities may influence perioperative bleeding risk and healing responses, potentially affecting surgical outcomes. This study investigates the association between preoperative platelet counts and readmission and reoperation rates in THA patients.

METHODS: We performed a retrospective analysis using the ACS NSQIP database (2010-2022) of adults undergoing primary THA. Patients were stratified by preoperative platelet counts: thrombocytopenia ($<150 \times 10^3/\mu L$), normal ($150-400 \times 10^3/\mu L$), and thrombocytosis ($>400 \times 10^3/\mu L$). Multivariable regression analyses assessed associations between platelet categories and outcomes while controlling for confounders including age, sex, BMI, comorbidities, smoking status, operative time, and anesthesia type.

RESULTS: Among 304,078 patients analyzed, 13,876 (4.6%) had thrombocytopenia, 281,678 (92.6%) had normal counts, and 8,524 (2.8%) had thrombocytosis. Both platelet abnormalities were independently associated with increased readmission and reoperation risks. Thrombocytopenia conferred 36% higher odds of readmission (OR=1.36; 95% CI: 1.26-1.47; p<0.001) and 23% higher odds of reoperation (OR=1.23; 95% CI: 1.10-1.37; p<0.001). Thrombocytosis was associated with 56% higher odds of readmission (OR=1.56; 95% CI: 1.41-1.72; p<0.001) and 48% higher odds of reoperation (OR=1.48; 95% CI: 1.29-1.68; p<0.001).

DISCUSSION AND CONCLUSION: This research suggests that abnormal preoperative platelet counts may correlate with increased readmission and reoperation rates following THA, with particularly elevated risks associated with thrombocytosis. These findings align with expected pathophysiology, as thrombocytosis may promote bleeding complications through platelet dysfunction while thrombocytopenia may reflect systemic conditions impairing recovery. Future studies may want to investigate underlying mechanisms, evaluate targeted perioperative interventions, and assess whether preoperative optimization could improve outcomes. These findings highlight the potential utility of preoperative platelet counts in risk stratification protocols for THA patients.

Table 1: Univariable Analysis of Patients Undergoing Total Hip Arthroplasty with Thrombocytopenia, Thrombocytosis, or Normal platelet count

Characteristic	<150 N = 13,876	150-400 (Reference) N = 281,678	>400 N = 8,524	p-value
Age (years)				<0.001
18-39	248 (1.8%)	6,182 (2.2%)	405 (4.8%)	
40-49	529 (3.8%)	16,173 (5.7%)	719 (8.4%)	
50-59	2,136 (15%)	57,066 (20%)	1,791 (21%)	
60-69	4,163 (30%)	96,774 (34%)	2,727 (32%)	
70-79	4,272 (31%)	75,175 (27%)	1,994 (23%)	
80+	2,528 (18%)	30,308 (11%)	888 (10%)	
Sex				<0.001
Female	4,959 (36%)	156,495 (56%)	6,479 (76%)	
Non-Female	8,917 (64%)	125,108 (44%)	2,043 (24%)	
Unknown	0	75	2	
Race				<0.001
White	10,177 (73%)	205,144 (73%)	6,004 (70%)	
Asian	196 (1.4%)	4,781 (1.7%)	184 (2.2%)	
Black or African American	1,081 (7.8%)	22,265 (7.9%)	973 (11%)	
Native Hawaiian or Pacific Islander	75 (0.5%)	1,655 (0.6%)	69 (0.8%)	
Other	16 (0.1%)	521 (0.2%)	19 (0.2%)	
Unknown/Not Reported	2,331 (17%)	47,312 (17%)	1,275 (15%)	
Ethnicity				<0.001
Non-Hispanic	11,009 (79%)	223,322 (79%)	6,896 (81%)	
Hispanic	476 (3.4%)	9,547 (3.4%)	332 (3.9%)	
No Response	2,391 (17%)	48,809 (17%)	1,296 (15%)	
BMI Classification				<0.001
Healthy	2,910 (21%)	54,523 (20%)	2,333 (28%)	
Underweight	212 (1.5%)	2,560 (0.9%)	260 (3.1%)	
Overweight	4,554 (33%)	92,597 (33%)	2,540 (30%)	
Obese	6,002 (44%)	129,595 (46%)	3,288 (39%)	
Unknown	198	2,403	103	
ASA Classification				<0.001
1-No Disturb	249 (1.8%)	9,565 (3.4%)	145 (1.7%)	
2-Mild Disturb	4,509 (33%)	144,623 (51%)	4,035 (47%)	
3-Severe Disturb	8,103 (58%)	121,250 (43%)	4,099 (48%)	
≥4-Life Threat / Moribund	5,000 (7.2%)	5,886 (2.1%)	234 (2.7%)	
Unknown	15	354	11	
Smoking Status	1,808 (13%)	34,770 (12%)	1,687 (20%)	<0.001
Preoperative Functional Health Status				<0.001
Independent	13,248 (96%)	274,403 (98%)	8,120 (96%)	
Partially Dependent	517 (3.7%)	5,852 (2.1%)	336 (4.0%)	
Totally Dependent	57 (0.4%)	391 (0.1%)	29 (0.3%)	
Unknown	54	1,032	39	
Immunosuppressive Therapy	799 (5.8%)	10,557 (3.7%)	624 (7.3%)	<0.001
Surgical Indication				<0.001
Other	3,739 (27%)	38,001 (13%)	1,902 (22%)	
Inflammatory Arthritis	17 (0.1%)	274 (<0.1%)	27 (0.3%)	
Osteoarthritis	10,120 (73%)	243,403 (86%)	6,595 (77%)	
Emergency Procedure	490 (3.5%)	2,772 (1.0%)	139 (1.6%)	<0.001
Unknown	0	1	0	
Diabetes				<0.001
No	11,431 (82%)	247,068 (88%)	7,339 (86%)	
Non-Insulin	1,643 (12%)	26,447 (9.4%)	902 (11%)	
Insulin	802 (5.8%)	8,163 (2.9%)	283 (3.3%)	
Unplanned Readmission	804 (5.8%)	9,040 (3.2%)	465 (5.5%)	<0.001
Unplanned Reoperation	387 (2.8%)	5,195 (1.8%)	255 (3.0%)	<0.001

1 n (%); Mean (SD)
2 Pearson's Chi-squared test; Kruskal-Wallis rank sum test

Table 2: Adjusted Multivariable Regression of Preoperative Platelet Count with Readmission and Reoperation

Platelet Count	Readmission OR[a] (95% CI[b])	p-value	Reoperation OR[a] (95% CI[b])	p-value
$150-400 \times 10^3/\mu L$ (Ref)	—	—	—	—
$<150 \times 10^3/\mu L$	1.36 (1.26, 1.47)	<0.001	1.23 (1.10, 1.37)	<0.001
$>400 \times 10^3/\mu L$	1.56 (1.41, 1.72)	<0.001	1.48 (1.29, 1.68)	<0.001

[a] Odds Ratio [b] Confidence Interval