Platelet-Rich Plasma Injections Within Six Months Prior to Total Shoulder Arthroplasty Are Associated with Increased Early Infection Risk

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INTRODUCTION: Platelet-rich plasma (PRP) is increasingly used for management of shoulder osteoarthritis. However, the impact of PRP injections when administered shortly before total shoulder arthroplasty (TSA) has not been studied. The purpose of the present study is to evaluate the risk of postoperative infection and revision after total shoulder arthroplasty.

METHODS: Using the PearlDiver Mariner database (2010–2022), we identified 83 patients who received PRP injections within one year of undergoing TSA. These patients were matched 1:4 to 332 controls based on demographics and comorbidities. This methodology mimics that of previously published studies evaluating risk of infection after cortisone shots. Postoperative outcomes, including 3-month and 3-year infection rates and revision TSA, were compared. A subgroup analysis was performed based on timing of PRP injection: 0–6 months versus 6–12 months before surgery.

RESULTS: Baseline characteristics were well-matched between groups (p > 0.9 for all variables) (Table 1). While not statistically significant, patients who received PRP within one year prior to TSA experienced higher rates of 3-month infection (2.4% vs. 0.3%, OR 8.17; p = 0.192), 3-year infection (3.6% vs. 1.5%, OR 2.45; p = 0.421), and revision TSA (4.8% vs. 1.2%, OR 4.15; p = 0.090). Subgroup analysis revealed a significantly increased risk of 3-month infection in patients who received PRP within 0–6 months before TSA (6.1% vs. 0.3%; OR 21.4, 95% CI 1.88–242.21; p = 0.001). No acute infections occurred in the 6–12 month PRP subgroup.

DISCUSSION AND CONCLUSION:

In this large national database study, PRP administration within six months of TSA is associated with a increased risk of early postoperative infection. The results are limited due to low numbers which may not include all patients who received PRP unless this was coded correctly at the time of administration. These findings suggest the timing of PRP injections may have clinical implications for surgical planning and risk stratification prior to TSA, and further research is needed in this   area.

Table 1: Cohort Demographics for Patients who Received PRP within 1 year of TSA

	PRP Within 1 Year of TSA* (n=83)	Matched Control* (n=332)	P-value†
Age (Mean ± SD)	65.2 ± 7.9	65.2 ± 7.8	0.980
CCI (Mean ± SD)	2.3 ± 2.2	2.3 ± 2.1	0.929
Female	41 (49.4%)	164 (49.4%)	1
Tobacco Use	45 (54.2%)	184 (55.4%)	0.941
Obesity	45 (54.2%)	178 (53.6%)	1
Diabetes	34 (41.0%)	135 (40.7%)	1

*Data reported as n (%) unless otherwise indicated.
†Statistical comparison performed using Student t-test or chi-squared test; bolded values are statistically significant at P<0.05
PRP: platelet-rich plasma; CCI: Charlson Comorbidity Index

Table 2: Post-Operative Outcomes for Patients who Received PRP within 1 year of TSA

	PRP Within 1 Year of TSA (n=83)	Matched Control (n=332)	Odds Ratio (95% CI)	P-value†
3-Month Infection	2 (2.4%)	1 (0.3%)	8.17 (0.73-91.24)	0.192
3-Year Infection	3 (3.6%)	5 (1.5%)	2.45 (0.57-10.48)	0.421
Revision TSA	4 (4.8%)	4 (1.2%)	4.15 (1.02-16.96)	0.090

Data reported as n (%) unless otherwise indicated.
†Statistical comparison performed using Student t-test or chi-squared test; bolded values are statistically significant at P<0.05
PRP: platelet-rich plasma

Table 3: Statistical Comparisons of Infection Rates Based on Time of PRP Injection

	3 Month Infection			3 Year Infection		
Variable	N (%)	Odds Ratio (95% CI)	P-value†	N (%)	Odds Ratio (95% CI)	P-value†
PRP 0-6 Months (n=33)	2 (6.1%)	21.4 (1.88-242.21)	**0.001**	2 (6.1%)	4.22 (0.79-22.65)	0.431
PRP 6-12 Months (n=50)	0 (0.0%)	-		1	1 (2%)	1.33 (0.15-11.67)	1

Data reported as n (%) unless otherwise indicated.
†Odds ratio compared versus control group; Statistical comparison performed using Student t-test or chi-squared test; bolded values are statistically significant at P<0.05