

Complication Profiles After Total Hip Arthroplasty in Non-Cirrhotic NAFLD Versus Cirrhotic Patients: A National Matched Cohort Comparison

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INTRODUCTION: Rising obesity has led to a surge in non-alcoholic fatty liver disease (NAFLD), now the most common chronic liver disease in the U.S. As obesity is also a major risk factor for osteoarthritis, orthopedic surgeons increasingly encounter patients with hepatic dysfunction undergoing joint replacement. While the surgical risks of cirrhosis are well-documented, direct comparisons between NAFLD and non-alcoholic cirrhosis in the context of total hip arthroplasty (THA) remain limited. This study compares postoperative outcomes following THA in matched cohorts with NAFLD versus cirrhosis.

METHODS: A retrospective cohort analysis was conducted using the Mariner M170Ortho database (PearlDiver Technologies), a nationally representative claims database. From an initial pool of 1,864,381 patients who underwent primary THA between 2010 and 2020, individuals with NAFLD or non-alcoholic cirrhosis were identified using validated ICD-9 and ICD-10 codes. Following application of inclusion criteria and continuous enrollment filters, 1:1 propensity score matching was performed based on demographics and major comorbidities. The final matched cohort included 6,828 patients (3,414 NAFLD; 3,414 cirrhosis). Multivariable logistic regression models were constructed to compare postoperative outcomes, controlling for age, sex, and Charlson Comorbidity Index (CCI).

RESULTS: At 90 days, cirrhotic patients experienced significantly higher rates of pulmonary embolism (OR 0.20, p = 0.037), hematoma (OR 0.11, p < 0.001), transfusion (OR 0.31, p < 0.001), acute kidney injury (OR 0.64, p = 0.005), and hospital readmission (OR 0.72, p = 0.006). The composite complication rate was also significantly elevated (OR 0.68, p < 0.001). At 1 year, these trends persisted, with significantly higher rates of pulmonary embolism (OR 0.30, p = 0.016), hematoma (OR 0.16, p < 0.001), transfusion (OR 0.33, p < 0.001), acute kidney injury (OR 0.72, p = 0.002), and readmission (OR 0.72, p = 0.006), along with increased overall complication rates (OR 0.77, p < 0.001).

DISCUSSION AND CONCLUSION: Compared to patients with NAFLD, those with non-alcoholic cirrhosis undergoing THA are at significantly increased risk for multiple postoperative complications within both 90-day and 1-year intervals. These findings underscore the need for heightened perioperative vigilance and tailored risk stratification in cirrhotic patients

Variable	Total Hip Arthroplasty Baseline Demographics			90 Day Total Hip Arthroplasty Outcomes					1 Year Total Hip Arthroplasty Outcomes						
	NAFLD	Cirrhosis	p-value	Adverse Events*	NAFLD	Cirrhosis	p-value	OR (95% CI)	Adjusted p-value	Adverse Events*	NAFLD	Cirrhosis	p-value	OR (95% CI)	Adjusted p-value
Age <55	460	460		SSI	37	48	0.275	0.69 (0.42 - 1.13)	0.135	SSI	86	82	0.324	1.17 (0.85 - 1.63)	0.344
Age ≥55	2947	2947		PJI	67	63	0.791	1.01 (0.70 - 1.48)	0.933	PJI	95	92	0.882	1.00 (0.73 - 1.36)	0.983
Male	1635	1635		DVT	45	49	0.755	0.95 (0.62 - 1.45)	0.808	DVT	73	82	0.516	0.91 (0.65 - 1.27)	0.597
Female	1779	1779		Pulmonary Embolism	2	12	0.016	0.20 (0.03 - 0.75)	0.037	Pulmonary Embolism	6	20	0.011	0.30 (0.10 - 0.74)	0.016
Asthma	403	341	0.018	Wound Disruption	47	49	0.918	0.92 (0.59 - 1.42)	0.707	Wound Disruption	66	65	1	1.01 (0.71 - 1.49)	0.872
COPD	465	537	<0.001	Hematoma	7	41	<0.001	0.11 (0.03 - 0.28)	<0.001	Hematoma	13	40	<0.001	0.16 (0.07 - 0.31)	<0.001
CKD	323	346	0.371	Pneumonia	58	74	0.187	0.78 (0.53 - 1.13)	0.199	Pneumonia	141	168	0.130	0.89 (0.70 - 1.14)	0.356
CHF	258	260	0.964	Transfusion	51	143	<0.001	0.31 (0.21 - 0.44)	<0.001	Transfusion	75	181	<0.001	0.33 (0.24 - 0.46)	<0.001
CAD	650	533	<0.001	AKI	91	129	0.011	0.64 (0.47 - 0.87)	0.005	AKI	199	253	0.010	0.72 (0.58 - 0.89)	0.002
Diabetes Mellitus	1077	998	0.040	Cardiac Arrhythmia	3	7	0.342	0.42 (0.06 - 1.81)	0.288	Cardiac Arrhythmia	9	14	0.404	0.64 (0.24 - 1.55)	0.339
HTN	2327	2099	<0.001	UTI	163	200	0.052	0.81 (0.64 - 1.01)	0.064	UTI	385	430	0.101	0.88 (0.75 - 1.03)	0.124
IHD (ischemic heart)	658	579	0.014	Reoperation	53	63	0.399	0.82 (0.55 - 1.20)	0.309	Reoperation	87	106	0.189	0.79 (0.58 - 1.07)	0.134
Obesity	1017	766	<0.001	Readmission	146	191	0.014	0.72 (0.56 - 0.91)	0.006	Readmission	146	191	0.014	0.72 (0.56 - 0.91)	0.006
Osteo	3089	2834	<0.001	Any Complication	538	712	<0.001	0.68 (0.59 - 0.77)	<0.001	Any Complication	919	1090	<0.001	0.77 (0.69 - 0.86)	<0.001
HTD	4	13	0.052	PJI Revision	36	31	0.623	1.13 (0.67 - 1.90)	0.639						
Rheum/Arthritis	162	176	0.468	MUA	1	1	1	28.11 (0.04 - 28.11)	0.941						
Tobacco Use	1219	986	<0.001	Any Revision	101	122	0.173	0.80 (0.60 - 1.07)	0.133						
Alcohol Abuse	522	545	0.463												
Liver Disease	1825	2386	<0.001												
Cancer	846	711	<0.001												
Coagulopathy	295	540	<0.001												
Deficiency Anemia	688	828	<0.001												

Table 1. Matched cohort patient demographics. * Denotes matching criteria. Bold = statistically significant.
 *Adjusted for age, gender, CCI
 Table 2. Complications within 90 days following total hip arthroplasty. Bold = statistically significant
 *Adjusted for age, gender, CCI
 Table 3. Complications within 1 year following total hip arthroplasty. Bold = statistically significant