

Spinal versus General Anesthesia Effects on Postoperative Recovery and 1-year Reoperation Rate in Total Hip Arthroplasty

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INTRODUCTION: Existing literature suggests spinal anesthesia in total hip arthroplasty (THA) results in lower pain scores, length of stay (LOS), and in some cases revision rates at 30 and 90-day post-op compared to general anesthesia. Our study aims to not only contribute to existing literature, but to also provide further insight into differences in early post-op recovery and survivorship up to one year.

METHODS: A retrospective cohort analysis was performed of all primary THA patients at a large teaching hospital. Standard 3-hour nursing post-op assessments of pain, mobility, function, and reoperations within 1 year were assessed. Patients missing postoperative notes assessing pain and ambulatory ability or anesthesia data were excluded. Statistical analysis involved t-tests for continuous variables and chi-squared tests for categorical variables.

RESULTS: 457 patients (98 general, 359 spinal) were analyzed. Spinal anesthesia patients displayed lower average Charlson Comorbidity scores, Elixhauser 30-day readmission scores, and Elixhauser Inpatient Mortality scores ($p < 0.01$), however, BMI was not significantly different (27.63 kg/m^2 vs 29.04 kg/m^2 , $p = 0.08$). Length of surgery was decreased in patients receiving spinal anesthesia (105.12 minutes vs 118.47 minutes, $p < 0.01$). Spinal anesthesia patients had lower rates of all-cause reoperations within 90-days post-op (0% vs 3.1%, $p = 0.01$) and within 1-year post-op (0% vs 3.1%, $p = 0.01$). At 3-hours post-op, no significant differences in average distance ambulated, pain score, or flexion ability were observed ($p > 0.05$), however, the capacity to dangle the affected limb was improved (291 seconds vs 73 seconds, $p = 0.02$). No differences in length of stay or average morphine milligram equivalent usage during inpatient stay were observed ($p > 0.05$).

DISCUSSION AND CONCLUSION: The study suggests that spinal anesthesia is associated with lower reoperation rates up to one year following THA. However, physical function recovery at 3 hours post-op was largely unchanged. This reaffirms prior literature findings at 90 days and provides information on more immediate as well as one-year outcomes. Further study, or multivariate analysis to isolate for the effects of anesthesia type, may be performed to better understand the role of anesthesia in THA outcomes.

Table 1: Demographics

	General n=98		Spinal n=359		Overall p-value
	N	Mean %SD	N	Mean %SD	
Demographics and Comorbidities					
Male	47	48.0	176	49.0	0.882
Age	67.41	11.2	65.3	10.5	0.448
BMI (kg/m ²)	28.04	7.3	27.83	5.3	0.078
CCI	21	2.9	0.71	1.6	0.000
CCI	0.000				
0	47	48.0	261	72.7	
1-2	23	23.5	69	19.2	
3-4	15	15.3	19	5.3	
5+	13	13.3	10	2.8	
Elixhauser 30 Day Readmission Index	22.97	27.4	8.7	15.3	0.000
Elixhauser Inpatient Mortality Index	5.37	12.5	1.52	7.1	0.004
Race	0.314				
American Indian/Alaska Native	0	0.0	3	0.8	
Asian	2	2.0	14	3.9	
Black or African American	16	16.3	42	11.7	
Native Hawaiian or Other PI	1	1.0	0	0.0	
White	73	74.5	282	78.6	
Other/Unknown/Declined	6	6.1	19	5.0	
Current Smoker	5	5.1	16	4.5	0.787
Current Drinker	39	39.8	178	49.8	0.088
ASA Rating	0.000				
1	9	9.2	26	7.2	
2	45	45.9	253	70.5	
3	44	44.9	79	22.0	
4	0	0.0	1	0.3	
Length of Surgery (mins)	118.47	33.0	105.12	30.9	0.000

Table 2: Outcomes

	General n=98		Spinal n=359		Overall p-value
	N	Mean %SD	N	Mean %SD	
Revision Data					
ED Visit 90 Days	6	6.1	23	6.4	0.919
Reoperation 90 Days	3	3.1	0	0.0	0.010
Reoperation 1 Year	3	3.1	0	0.0	0.010
Post-op Function and Recovery					
Length of Stay (days)	1.57	2.2	1.3	1.7	0.254
Total Inpatient MME	513.09	350.9	417.77	252.5	0.051
Ambulation 3 Hours	23.73	36.4	31.72	43.8	0.068
Pain Score 3 Hours	4.18	2.5	3.89	2.8	0.330
Flexion 3 Hours	0.296				
Moderate	18	28.6	58	27.5	
Strong	41	65.1	148	70.1	
Weak	4	6.3	5	2.4	
Dangle 3 Hours (seconds)	73	81.1	291	90.1	0.020