Neuraxial vs. General Anesthesia in Total Hip Arthroplasty for Femoral Neck Fracture: A Comparison of Post-operative Complications

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INTRODUCTION:

Rates of complications with differing anesthetic choices has not been directly compared for patients undergoing total hip arthroplasty (THA) for femoral neck fractures. This study sought to directly compare neuraxial vs. general anesthetic use and compare post-operative outcomes for patients undergoing THA for a femoral neck fracture.

METHODS:

From 2012-2021, the National Surgical Quality Improvement Project (NSQIP) database was used to identify all patients undergoing THA for a femoral neck fracture. Anesthetic type was identified and categorized as neuraxial (spinal, epidural) or general. Demographic and comorbid variables were collected. Days from admission to surgery was also identified. Postoperative complications were then compared between cohorts.

RESULTS:

8,130 patients were included in analysis. 26% received neuraxial anesthesia. There was no difference in age, gender, or smoking status between cohorts. Patients receiving neuraxial anesthesia had a slightly lower BMI, less comorbidities, and were more likely to undergo surgery on the day of admission or the day after admission, but these differences were small (**Table 1**). On univariate analysis, patients receiving neuraxial anesthesia had a lower risk of readmission (5.8 vs 7.1%), discharge to a non-home destination (44.5 vs. 55.8%), an extended post-operative LOS (36.8 vs. 42.3%), or any post-operative medical complication (6.4% vs. 8.4%) (**Table 2**). On multivariate analysis, there was a 1.30 (p=.009) times increased odds of any medical complication, a 1.22 (p<0.001) times increased odds of an extended post-operative LOS, and a 1.60 (p<0.001) times increased odds of a non-home discharge destination for those receiving general vs. neuraxial anesthesia. There was no difference in readmission rates (1.19, p=0.100) (**Table 3**).

DISCUSSION AND CONCLUSION:

his study finds that neuraxial anesthesia is associated with improved short-term outcomes compared to general anesthesia for patients receiving THA for a femoral neck fracture. The results of this study would suggest that in the appropriate patient, spinal anesthesia may be preferable to general anesthesia for THA done for femoral neck fractures.

Table 1. Univariate comparison of patient variables between those receiving general vs. neuraxial anesthesia

Characteristic		General	Neuraxial	P-value
Total Patients		6057 (74%)	2123 (26%)	
Sex	Male	1997 (33.0%)	696 (32.8%)	0.875
	Female	4060 (67.0%)	1427 (67.2%)	
Average BMI (Standard Deviation)		25.9 (5.7)	25.3 (5.1)	<0.001
BMI Category	<21	1891 (31.2%)	698 (32.9%)	0.005
	21-25	1065 (17.6%)	407 (19.2%)	
	25-29	1958 (32.3%)	686 (32.3%)	
	30-34	786 (13.0%)	247 (11.6%)	
	35-39	232 (3.8%)	60 (2.8%)	
	≥40	125 (2.1%)	25 (1.2%)	
Median Age (Interquartile Range)		71.9 (11.1)	71.8 (10.9)	0.461
Age Category	<54 yrs	414 (6.8%)	122 (5.7%)	<0.001
	55-64 yrs	1316 (21.7%)	466 (22.0%)	
	65-74 yrs	1897 (31.3%)	754 (35.5%)	
	75-84 yrs	1727 (28.5%)	528 (24.9%)	
	≥85 yrs	703 (11.6%)	253 (11.9%)	
Modified Frailty Score	0	2112 (34.9%)	865 (40.7%)	<0.001
	1	2600 (42.9%)	846 (39.8%)	
	2	1126 (18.6%)	342 (16.1%)	
	3+	219 (3.6%)	70 (3.3%)	
Smoking Status	Past or non-smoker	5093 (84.1%)	1789 (84.3%)	0.843
	Current Smoker	964 (15.9%)	334 (15.7%)	
Days to Surgery from Admission	0 or 1 day	4392 (72.5%)	1598 (75.3%)	0.013
	2 days	1158 (19.1%)	345 (16.3%)	
	3+ days	507 (8.4%)	180 (8.5%)	

*Chi-square analysis for categorical variables , independent samples t-test for continous variables

Table 2. Univariate analysis of post-operative outcomes in those receiving general vs. neuraxial anesthesia

Characteristic	General	Neuraxial	P-value
30-day readmission	433 (7.1%)	124 (5.8%)	0.040
Extended post-operative length of stay (>3 days)	2,562 (42.3%)	2,123 (35.8%)	<0.001
Any 30-day medical complication	509 (8.4%)	136 (6.4%)	0.003
Non-home discharge destination	6,057 (55.8%)	944 (44.5%)	<0.001
Unplanned post-operative intubation	51 (0.8%)	9 (0.4%)	0.052
Deep vein thrombosis or pulmonary embolism	98 (1.6%)	25 (1.2%)	0.151

*Chi-square analysis for categorical variables

Table 3. Multivariate analysis of post-operative outcomes comparing those receiving general to neuraxial anesthesia

Characteristic	Odds Ratio	P-value
30-day readmission	1.91 (0.96-1.47)	0.100
Extended post-operative length of stay (>3 days)	1.22 (1.10-1.35)	<0.001
Any 30-day medical complication	1.30 (1.07-1.51)	0.009
Non-home discharge destination	1.59 (1.43-1.78)	<0.001
Unplanned post-operative intubation	1.92 (0.94-3.94)	0.075
Deep vein thrombosis or pulmonary embolism	1.34 (0.86-2.09)	0.194

*Chi-square analysis for categorical variables