

Spinal Anesthesia and its Association with Deep Vein Thrombosis following Intertrochanteric Fracture Repair: A Retrospective Cohort Study

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INTRODUCTION: Intertrochanteric fractures are common in the elderly and often require surgical fixation. While both general and spinal anesthesia are widely used for operative management, their effect on postoperative outcomes such as DVT remains unclear. This study sought to assess the relationship between anesthesia modality and DVT occurrence in patients who underwent an intertrochanteric fracture repair.

METHODS:

The study was performed using the National Surgical Quality Improvement Program (NSQIP) database of open treatment of femoral fractures between the trochanters, occurring between 2010-2022. Inclusion criteria was age \geq 18 years. Patients were divided into two cohorts based on if they underwent general or spinal anesthesia. The primary outcome was procedure-related complications such as DVT, myocardial infarction, sepsis, septic shock, pneumonia, and pulmonary embolism, renal injury, wound disruption, and urinary tract infection. Potential confounders included demographics (age, sex, race, ethnicity), baseline health status (BMI, smoking status, history of diabetes, immunosuppressive therapy). Univariate analyses were performed to assess differences between the two cohorts. Multivariable regression analysis adjusted for confounders, was performed to assess the relationship between anesthesia modality and procedure outcomes.

RESULTS:

During the study period, 127,125 patients underwent this surgery. 92,624 patients received general anesthesia, whereas 25,570 patients underwent spinal anesthesia. The most common demographics are: 80+ y/o, female, white, non-hispanic, normal BMI, ASA class 3, non-smokers, non-diabetics, and not on immunosuppressive therapy. On multivariate regression analysis, patients who received spinal anesthesia, rather than general anesthesia, had 22% lower odds (95% CI: 0.67-0.90; $p < 0.001$) of DVT [table 2].

DISCUSSION AND CONCLUSION: Patients undergoing a repair of an intertrochanteric fracture who received spinal anesthesia may have decreased risk of a DVT than those receiving general anesthesia.

Analysis of Patients Undergoing Intertrochanteric Fracture Open Reduction and Internal Fixation (ORIF) under General Anesthesia (GA) or Spinal Anesthesia (SA)

Characteristic	General	Spinal	p-value ^a
Sex			<0.001
Male	40,239 (50.4%)	14,801 (57.9%)	
Female	39,351 (50.1%)	7,189 (28.0%)	
Missing	8,035 (10.2%)	5,576 (21.6%)	
Age Group			<0.001
18-29	1,166 (1.5%)	83 (0.3%)	
30-39	1,319 (1.7%)	118 (0.5%)	
40-49	4,808 (6.1%)	378 (1.5%)	
50-59	12,360 (15.7%)	2,845 (11.1%)	
60-69	20,977 (26.6%)	5,541 (21.5%)	
70-79	31,834 (40.3%)	18,924 (73.4%)	
80+	491 (0.6%)	78 (0.3%)	
Race			<0.001
American Indian or Alaska Native	3048 (3.9%)	247 (1.0%)	
Asian	3727 (4.7%)	303 (1.2%)	
Black or African American	108 (0.1%)	22 (0.1%)	
Native Hawaiian or Pacific Islander	225 (0.3%)	17 (0.1%)	
Some Other Race	10,606 (13.5%)	12,581 (49.1%)	
Unspecified Hispanic	89,807 (114.0%)	11,749 (46.0%)	
Ethnicity (Hispanic?)			<0.001
No	11,658 (14.8%)	12,519 (49.1%)	
Unknown	14,568 (18.7%)	11,773 (46.0%)	
Yes	5,208 (6.7%)	622 (2.4%)	
BMJ Group			<0.001
Normal	36,810 (46.5%)	8,883 (34.3%)	
Obese	18,849 (23.9%)	2,719 (10.6%)	
Overweight	23,872 (30.2%)	6,154 (24.1%)	
Underweight	18,424 (23.4%)	7,773 (30.4%)	
Unknown	1,518 (2.0%)	0 (0.0%)	
Smoking Status (last year)			<0.001
Yes	12,866 (16.3%)	2,882 (11.3%)	
No	79598 (101.6%)	22678 (88.7%)	
Diabetes			<0.001
Insulin	8,972 (11.4%)	1,801 (7.1%)	
No	71,666 (90.6%)	21,717 (84.9%)	
Missing	10,389 (13.2%)	2,712 (10.6%)	
History (last year)			0.015
No	10,001 (12.7%)	1,582 (6.2%)	
Yes	8722 (11.1%)	2428 (9.5%)	
ASA Class			<0.001
1-2	891 (1.1%)	230 (0.9%)	
3	16,507 (21.0%)	4,481 (17.5%)	
4	65,437 (83.5%)	18,391 (72.0%)	
5	17,488 (22.2%)	6,139 (24.0%)	
6	128 (0.2%)	48 (0.2%)	
Missing	143 (0.2%)	51 (0.2%)	
Functional Status at Discharge			<0.001
Independent	71,998 (91.2%)	18,333 (71.6%)	
Partially Dependent	16,595 (21.1%)	4,209 (16.5%)	
Totally Dependent	3,139 (4.0%)	1,038 (4.0%)	
Unknown	900 (1.1%)	234 (0.9%)	
Wound Complications			<0.001
All within 7 days	3,316 (4.2%)	665 (2.6%)	
None within 7 days	2,186 (2.8%)	408 (1.6%)	
All within 30 days	384 (0.5%)	78 (0.3%)	
None within 30 days	318 (0.4%)	60 (0.2%)	
All within 90 days	1,155 (1.5%)	232 (0.9%)	
None within 90 days	62 (0.1%)	12 (0.0%)	
All within 180 days	403 (0.5%)	81 (0.3%)	
None within 180 days	1,854 (2.4%)	343 (1.3%)	
All within 365 days	7,142 (9.1%)	1,581 (6.2%)	
None within 365 days	3,854 (4.9%)	738 (2.9%)	
All within 7 days	303 (0.4%)	60 (0.2%)	
None within 7 days	1,712 (2.2%)	333 (1.3%)	

Deep Vein Thrombosis

Anesthesia Type	OR ^a	95% CI ^b	p-value
General	---	---	---
Spinal	0.78	0.67 – 0.90	<0.001

^aOdds Ratio ^bConfidence Interval