Effect of Spinal Versus General Anesthetic on 30-Day Outcomes in Patients with Chronic Obstructive Pulmonary Disease Undergoing Hip Arthroplasty for Femoral Neck Fracture

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INTRODUCTION: Patients with chronic obstructive pulmonary disease (COPD) and femoral neck fractures are at high risk for postoperative complications and mortality. One consideration to reduce risk is the type of anesthesia, although this has not been investigated. The purpose of this study was to compare 30-day complications between use of general and spinal anesthetic in patients with COPD and femoral neck fractures who underwent hip arthroplasty. METHODS:

Patients with COPD treated with hip arthroplasty for femoral neck fractures were identified on the American College of Surgeons' National Surgical Quality Improvement Program (ACS-NSQIP) database between January 1, 2015 and December 31, 2020. Demographics, patient variables, and surgical variables were recorded. Patients were divided into cohorts based on general or spinal anesthetic. 30-day outcome measures were compared between groups using Chi-squared test. Logistic regression was used to assess for risk factors for 30-day complications. Statistical significance was defined as p<0.05.

RESULTS: 5,040 patients with COPD were identified who underwent arthroplasty for femoral neck fracture – 3,800 with general anesthesia and 1,240 patients with spinal anesthesia. The general anesthesia cohort had higher rates of diabetes (18.4 vs. 15.1%, p=0.007), congestive heart failure (10.7 vs. 6.7%, p<0.001), and chronic kidney disease requiring dialysis (2.6 vs. 1.5%, p=0.019) (Table 1). The general anesthesia cohort had higher rates of 30-day readmission (13.7 vs. 11.5%, p=0.041), mortality (8.7 vs. 6.5%, p=0.015), prolonged intubation (1.7 vs. 0.8%, p=0.026), and unplanned intubation (2.9 vs. 0.9%, p<0.001) (Table 2). Logistic regression analysis identified general anesthetic to be an independent risk factor for 30-day mortality (RR 1.362 [1.144 – 1.621]), non-home discharge (RR 1.362 [1.144 – 1.621), surgical complications (RR 1.253 [1.035 – 1.518]), and unplanned intubation (RR 3.115 [1.661 – 5.841]) (Table 3).

DISCUSSION AND CONCLUSION: General anesthesia is an independent risk factor for 30-day mortality, non-home discharge, and unplanned intubation in patients with COPD undergoing arthroplasty procedures for femoral neck fractures. If possible, spinal anesthetic should be used to reduce risk of complications in this patient population.

Table 1. Demographics and media	cal comorf	idities of th	2 cohort			Table 2. 30-day outcome measures and co	Table 2. 30-day outcome measures and complications					1	Table 3. Risk Factors Associated w	ith 30-day outcome measures/complications		Bleeding Disorder	1.575 [1.070 - 2.317]
											1		Relative Risk [95% C.I.]	1	ASA 4	2.470 [1.709 - 3.568]	
1	Spinal		Ge	teral	p-value		Spinal		General		p-value		Non-home discharge				
-	n	1,240	[n =	3,800			10	1 = 1,240	n -	3,890		-	General Anesthesia	1.362 [1.144 - 1.621]		Bleeding Requiring Transfusion	
Sex				20.001	A 141	Readmission	142	11.5%	521	13.7%	0.041		<60 years old	0.159 [0.113 - 0.225]		General Anesthesia	1.299 [1.061 - 1.590]
Maie Famile	461	37.2%	1,443	58.0%	0.010	Non-home discharas	908	80.5%	3 183	81.8%	0.795		60-70 years old	0.256 [0.205 - 0.319]		Male	0.833 [0.702 - 0.988]
Female	119	02.8%	2,357	62.0%		Mortality	81	6.5%	111	8 7%	0.015		70-80 years old	0.443 [0.367 - 0.535]		Underweight	1 591 [1 224 - 2 067]
A rest of the second						bonany	0.1	0.574		0.776	0.01.5		Smoking	0.782 [0.661 0.027]		Married Weight	1.334 [1.018 1.448]
Age (years)	22	2.00	140	2.04	0.010	Survical Complications							Distoking	1 226 [1 124 1 666]		Smaking	0.671 [0.656 0.909]
10.00	34	2.0%	145	3.976	0.030	Overall	163	13.1%	661	17,4%	<0.001		ASA 2	0.280 [0.223 0.628]		Caractering Heart Failure	1.366 [1.068 1.744]
70.70	100	28.6%	1 210	13.476	0.011	Superficial surgical site infection	11	0.9%	36	0.9%	0.848		101.2	0.380 [0.273 - 0.328]		Congestive rieart Fantare	1.505 [1.008 - 1.744]
90.90	503	40.6%	1,210	26.09/	0.034	Wound infection	6	0.5%	14	0.4%	0.574		ASA 3	0.744 [0.627 - 0.883]		Hypertension	1.226 [1.009 - 1.491]
001	106	16.99/	461	11.09/	<0.020	Deep surgical site infection	7	0.6%	27	0.7%	0.585		OR time <60 minutes	0.850 [0.725 - 0.995]		Dialysis	2.328 [1.539 - 3.522]
301	190	13.876	401	11.278	-40001	Dehiscence	1	0.1%	5	0.1%	>0.999					Cancer	1.900 [1.208 - 2.987]
m (destarb)						Blooding	143	11.5%	601	15.8%	<0.001		Mortality			Bleeding Disorder	1.343 [1.113 - 1.620]
Dedaraniaht	172	12.054	426	11.2%	0.012								General Anesthesia	1.508 [1.163 - 1.956]		Transfusion within 48 hours	1.386 [1.172 - 1.639]
Normal	608	49.0%	1 794	47.2%	0.265	Medical Complications	202	1.0.00		10.00	0.010		Male	1.534 [1.239 - 1.899]		ASA 4	1.386 [1.172 - 1.639]
Oceaning	216	75.450	072	25.69/	0.002	Overall	200	10.1%	112	18,776	0.038		70-80 years old	1.820 [1.197 - 2.767]		OR time <60 minutes	0.770 [0.644 - 0.922]
Obesity Class I	106	8 5%	413	10.9%	0.020	Unstantia Unstantian	101	0.176	112	2.0%	(0.519		80-90 years old	3.334 [2.247 - 4.945]		OR time >120 minutes	1.939 [1.520 - 2.473]
Oberity Class II	26	2 196	124	3.5%	0.013	Pulmonary embolism	2	0.6%	11	0.9%	0.295		90+ years old	5 143 [3 341 - 7 916]			
Obesity Class III	13	1.0%	61	1.6%	0.157	Ventilator >48 hours	10	0.8%	64	1.7%	0.026		Underweight	1.596 [1.185 - 2.149]		Medical Complications	
						Renal insufficiency	5	0.4%	28	0.7%	0.309		Renal Failure	3 032 [1 570 - 5 856]		Male	1 215 [1 047 - 1 410]
Comarbidities						Renal failure	8	0.6%	18	0.5%	0.464		Dishuis	1 755 [1 027 2 008]		\$0.00 years old	1 283 [1 005 1 505]
Diabetes	187	15.1%	701	18.4%	0.007	Urinary tract infection	43	3.5%	158	4.2%	0.281		Canada	1.840 [1.051 2.353]		904 upper ald	1.504 [1.305 - 1.305]
Smoking	360	29.0%	1.185	31.2%	0.154	Cerebrovascular accident	3	0.2%	21	0.6%	0.235		Cancer	1.649 [1.031 - 3.232]		Chara III Obasita	2,020 (1,214 , 2,262)
Ascites	3	0.2%	13	0.3%	0.586	Cardiac arrest	7	0.6%	- 44	1.2%	0.070		Chronic Steroid Use	1.533 [1.143 - 2.056]		Class III Obesity	2.020 [1.214 - 3.362]
Congestive Heart Failure	83	6.7%	408	10.7%	<0.001	Myocardial infarction	32	2.6%	87	2.3%	0.558		ASA 4	2.513 [2.031 - 3.109]		Ascilles	3.203 [1.162 - 8.823]
Hypertension	831	67.0%	2.850	75.0%	<0.001	Deep veneus thremboembolism	0	0.5%	32	0.8%	0.205		ASA 5	7.441 [2.406 - 23.019]		Congestive Heart Failure	1.447 [1.160 - 1.804]
Renal Failure	14	1.1%	38	1.0%	0.696	Systemic sepsis	16	1.3%	61	1.6%	0.432					Hypertension	1.351 [1.133 - 1.612]
Dialysis	18	1.5%	99	2.6%	0.019	Sepice stock	1 11	0.9%	40	1.276	0.330		Surgical Complications				
Cancer	35	2.8%	80	2.1%	0.142								General Anesthesia	1.253 [1.035 - 1.518]		Readmission	
Chronic Steroid Use	143	11.5%	428	11.3%	0.795								Male	0.804 [0.683 - 0.946]		Congestive Heart Failure	1.484 [1.160 - 1.899]
Bleeding Disorder	128	10.3%	935	24.6%	<0.001								Underweight	1.264 [1.003 - 1.594]		Hypertension	1.345 [1.100 - 1.644]
Transfusion within 48 hours	31	2.5%	116	3.1%	0.315								Smoking	0.778 [0.654 - 0.926]		Bleeding Disorder	1.316 [1.088 - 1.592]
													Congestive Heart Failure	1.318 [1.040 - 1.671]		ASA 4	1.337 [1.128 - 1.586]
													Dialysis	2 181 [1 449 - 3 283]			
ASA Class	1	1	1		1								Canoer	2.065 [1.347 - 3.166]	1	Reoperation	
Class 1 (No disturbance)	1	0.1%	1	< 0.1	0.432								Bleeding Disorder	1 377 [1 151 - 1 647]		Class III Obesity	2.583 [1.205 - 5.538]
Class 2 (Mild disturbance)	65	5.2%	152	4.0%	0.061								Transfusion within 48 hours	4 000 [2 844 5 650]		Smoking	1.469 [1.092 - 1.977]
Class 3 (Severe disturbance)	736	59.4%	2,302	60.6%	0.444								ASA 2	0.607 [0.360 0.007]		Arcitar	4 957 [1 389 - 17 698]
Class 4 (Life threatening)	427	34.4%	1,331	35.0%	0.705								A3A 2	0.007 [0.309 = 0.997]		ASA 4	1.447 [1.000 1.005]
Class 5 (Moribund)	9	0.7%	8	0.2%	0.007								A5A 4	1.363 [1.160 - 1.602]		10014	Trees [1992]
													OR time < 60 minutes	0.762 [0.642 - 0.905]		Vandlatan 5.49 harres	
	1	1	1		1								OR times >120 minutes	1.813 [1.434 - 2.293]	1	ventuator >46 nours	
																Class III Obesity	3.556 [1.344 - 9.408]
													Unplanned intubation		1	Congestive Heart Failure	2.088 [1.169 - 3.730]
													General Anesthesia	3.115 [1.661 - 5.841]	1	ASA 4	2.252 [1.387 - 3.592]
													Normal Weight	0.659 [0.453 - 0.957]	1		
													Chronic Staroid Line	1 047 [1 244 - 2 046]			