

Impact of Regional Anesthesia on Outcomes of Trauma Patients Undergoing Surgical Rib Fixation: A TQIP-Based Study

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Introduction

Multimodal analgesia for rib fractures can include regional anesthesia (RA), like epidural/peripheral blocks.

Rib fixation is used in cases of severe displacement, flail segment or refractory pain

No clear guidelines regarding use of RA for patients undergoing surgical rib fixation^{1,2,3}

Study Aim: Assess impact of RA on patient outcomes and complications for those undergoing rib fixation. **Hypothesis:** RA does not impact mortality, LOS, or vent days.

Methods

Patients with isolated AIS-Chest who had rib fixation were identified in TQIP Jan – Dec 2021.

N_{total} = 290, N_{RA} = 150, N_{none} = 140

Matching criteria: GCS, ISS, AIS Chest, flail chest, hospital teaching status, hospital type

Data collected: Demographics, flail chest, injury severity, hospital complications, ventilator days, ICU days, hospital LOS, in-hospital mortality

Statistics: Numerical variables examined with Median Two-Sample T-Tests. Categorical variables examined with Fisher's Exact Test

Results

Demographics by Anesthesia Group			
Variables	Plating without RA	Plating with RA	p-value
	n = 140	n = 150	
	Median [IQR]	Median [IQR]	
Age	63.5 (55.5-74.5)	64 (55-73)	0.9248
	n (%)	n (%)	
Sex	Male 100 (71.43%)	99 (66.00%)	0.3756
Race	White 119 (85.00%)	133 (88.67%)	0.3874

Cohort Clinical Characteristics by Anesthesia Group			
Variables	Plating without RA	Plating with RA	p-value
	n = 140	n = 150	
	Median [IQR]	Median [IQR]	
Total GCS	15 (15-15)	15 (15-15)	0.1714
ISS	9 (9-9)	9 (9-9)	0.2356
AIS Chest	3 (3-3)	3 (3-3)	0.2356
	n (%)	n (%)	
Flail Chest	49 (35.00%)	44 (29.33%)	0.3162
Teaching Status	Academic 84 (64.00%)	100 (66.67%)	0.4955
Hospital Type	Non-Profit 136 (97.14%)	143 (95.33%)	0.5437

Cohort Outcomes by Anesthesia Group			
Outcomes	Plating without RA	Plating with RA	p-value
	n = 140	n = 150	
	n (%)	n (%)	
	Median [IQR]	Median [IQR]	p-value
Hospital Mortality	3 (2.14%)	1 (0.67%)	0.3559
	n (%)	n (%)	
HLOS	9 (7-11)	9 (7-12)	0.6119
ICU LOS	0 (0-4)	0 (0-4)	0.9418
	n (%)	n (%)	
ICU Days	0 Days 75 (53.57%)	81 (54.00%)	1.0000
	1-2 Days 11 (7.86%)	11 (7.33%)	
	3+ Days 54 (38.57%)	58 (38.67%)	
	n (%)	n (%)	
ICU Admission	65 (46.43%)	69 (46.00%)	1.0000
	Median [IQR]	Median [IQR]	p-value
Vent Days	0 (0-0)	0 (0-0)	0.1457
	n (%)	n (%)	
Vent Days	0 Days 118 (84.29%)	135 (90.00%)	0.3386
	1-2 Days 8 (5.71%)	6 (4.00%)	
	3+ Days 14 (10.00%)	9 (6.00%)	

Results

Cohort Complications by Anesthesia Group			
Complications	Plating without RA	Plating with RA	p-value
	n = 140	n = 150	
	n (%)	n (%)	
AKI	3 (2.14%)	1 (0.67%)	0.3559
Acute Respiratory Distress	1 (0.71%)	0 (0%)	0.4828
Cardiac Arrest with CPR	1 (0.71%)	1 (0.67%)	1.0000
DVT	1 (0.71%)	1 (0.67%)	1.0000
MI	1 (0.71%)	0 (0%)	0.4828
PE	0 (0%)	0 (0%)	N/A
Stroke/CVA	1 (0.71%)	2 (1.33%)	1.0000
Unplanned Intubation	5 (3.57%)	3 (2.00%)	0.4888
Unplanned Admission to ICU	9 (6.43%)	12 (8.00%)	0.6558
Severe Sepsis	2 (1.43%)	2 (1.33%)	1.0000
CAUTI	0 (0%)	0 (0%)	N/A
Ventilator-Associated Pneumonia	2 (1.43%)	1 (0.67%)	0.6111
Pressure Ulcer	1 (0.71%)	1 (0.67%)	1.0000
Delirium	4 (2.86%)	2 (1.33%)	0.4340

Conclusions

- No benefit with regional anesthesia for patients undergoing rib fixation
- Randomized controlled trials are warranted to inform clinical decision-making

Sources

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