



Pectointercostal Fascial Plane Block with or without Rectus Sheath Block in Cardiac Surgery: A Double-Blind Prospective Randomized Controlled Trial

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knowledge changing life

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Background

- Median sternotomy, chest tube insertion, and internal chest tube sites primarily drive post-cardiac surgical pain¹
- Pectointercostal fascial plane blocks (PIFB) provide analgesic benefit for median sternotomy pain after cardiac surgery²
- Rectus Sheath Block (RSB) targets anterior cutaneous branches of intercostal nerves that innervate sub-xiphoid chest tube insertion site³
- Studies examining the combination of PIFB + RSB are limited, with conflicting findings^{4,5,6}

Hypothesis

PIFB + RSB will provide more effective pain control than PIFB alone in patients undergoing cardiac surgery

Methods

- Inclusion criteria:** 18-85 year-olds undergoing CABG +/- single valve surgery with primary median sternotomy
- Exclusion criteria** designed to identify patients unlikely to be extubated within six hours, or chronic opioid use
- Patients randomized** to bilateral PIFB (15mL 0.25% bupi w/epi 1:200k) + RSB (10mL 0.25% bupi w/epi 1:200k OR placebo, 0.9% NS)

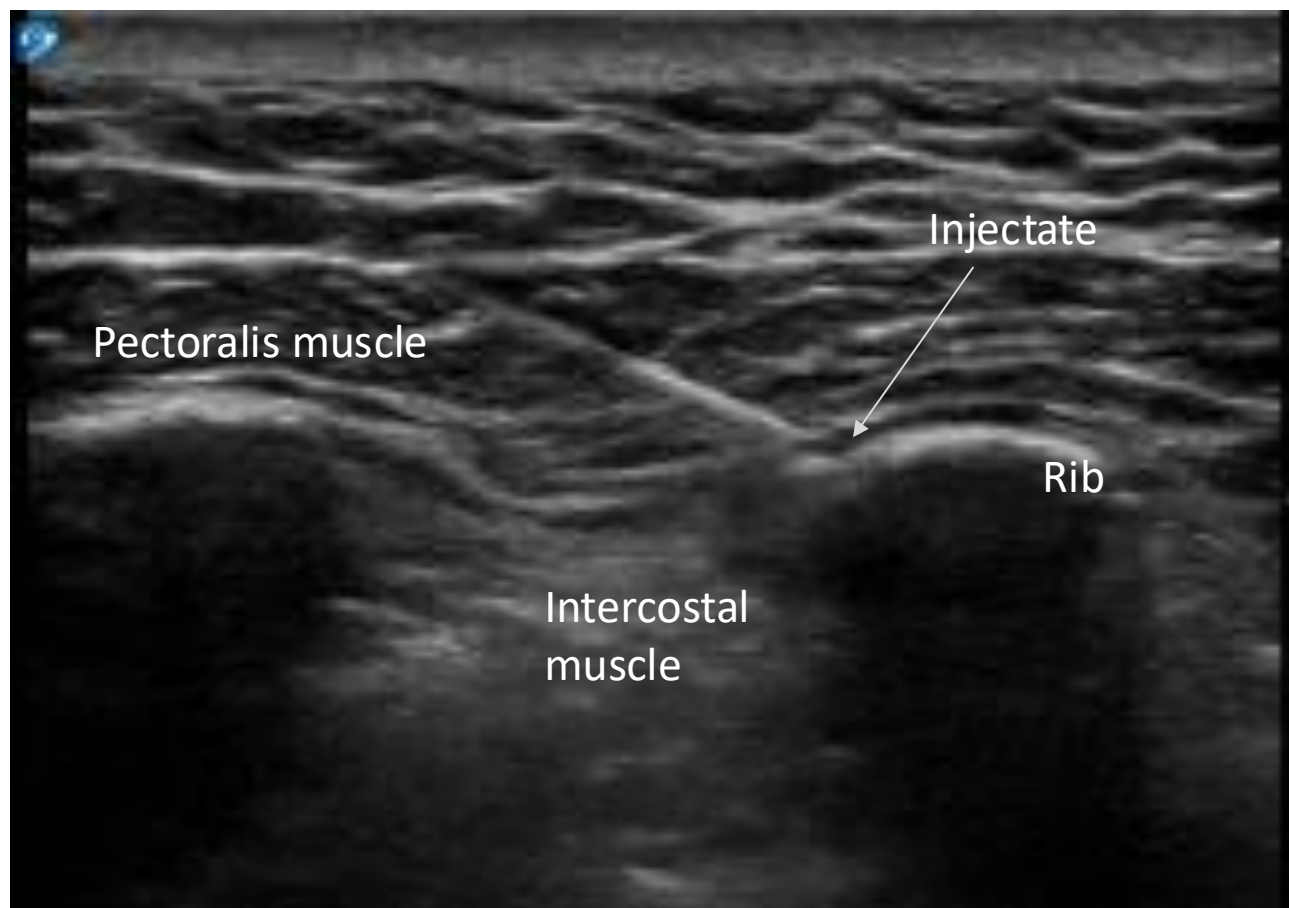


Figure 1. Pectointercostal fascial plane block



Figure 2. Rectus sheath block

Methods

- Primary Outcomes:** Pain scores at rest and with deep breathing within the first 24h after anesthesia stop
- Secondary Outcomes:**
 - Total cumulative opioid consumption at 24 and 48 hours postop
 - Change from baseline on incentive spirometry in first 24h
 - Time to extubation after surgery
 - Hospital and ICU length of stay
 - QoR-15 score⁷ 24 hours after extubation

Results

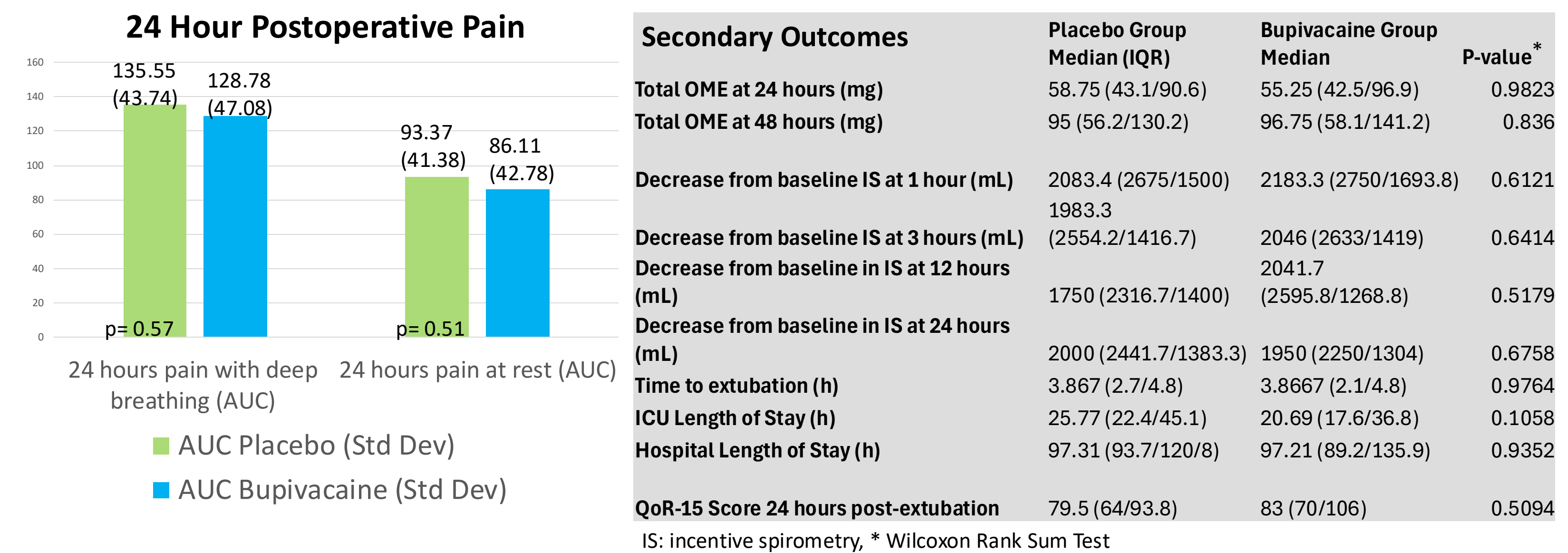
- 167 patients screened → 62 randomized → 60 completed all study procedures (*2 subjects removed post-randomization for surgical complications*)
- No differences in patient group characteristics or multimodal administration

	Placebo (PIFB + Saline RSB) n=30	PIFB + Bupivacai ne RSB n=30	P value ²
Demographics			
Sex, n (%)			0.8
Female	9 (30)	8 (27)	
Age, mean (years)	67.3 (8.79)	67.5 (9.51)	0.9
BMI, kg/m ²	30.8 (6.17)	28.9 (4.31)	0.3
PMH			
HTN, n (%)	21 (72.4)	20 (71.4)	0.8
DM, n (%)	7 (24.1)	8 (28.6)	0.8
CAD, n (%)	25 (86.2)	23 (82.1)	0.5
PVD, n (%)	3 (10.3)	3 (10.7)	>0.9
Neuropathy, n (%)	4 (13.8)	2 (7.1)	0.7
Anxiety, n (%)	5 (17.2)	2 (7.1)	0.4
Depression, n (%)	5 (17.2)	4 (14.3)	>0.9
CVA, n (%)	1 (3.4)	3 (10)	0.6
CKD/ESRD, n (%)	4 (13.8)	5 (21.5)	>0.9
COPD, n (%)	1 (3.4)	0 (0)	>0.9

	Placebo (PIFB + Saline RSB)	PIFB + Bupivacaine RSB	P value ²
Procedure			0.8
CABG, n (%)	20 (67)	18 (60)	
CABG + single valve, n (%)	3 (10)	3 (10)	
Single valve (n (%))	7 (23)	9 (30)	
Aortic crossclamp time (h), mean (SD)	1.32 (0.59)	1.47 (0.53)	0.2
CPB time (h), mean (SD)	1.78 (0.73)	1.85 (0.62)	0.6
Intraoperative OME (mg)	276.64 (102.9)	297.44 (65.13)	0.8
Multimodals in first 48 hours postop			
Ibuprofen (mg)	413.3 (463.7)	386.67 (451.6)	0.83
Ketorolac (mg)	29 (27.8)	30 (29.7)	0.99
APAP (mg)	5803.3 (1090.1)	5516.7 (1405.6)	0.56
Methocarbamol (mg)	1058.33 (548.1)	1166.67 (922.3)	0.88
Dexmedetomidin e (mcg)	47.43 (173.0)	12.44 (41.23)	0.44

Results

- No differences in primary or secondary outcomes between groups**



Key Finding:

The addition of bilateral rectus sheath blocks to bilateral pectointercostal fascial plane blocks DID NOT improve pain control for patients after cardiac surgery

Future Work

Study of opioid-sparing techniques that improve outcomes for patients after cardiac surgery (alternative blocks, medication dosage, catheters, etc.)

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¹Mean (SD) or Frequency (%) unless otherwise noted. ²Wilcoxon rank sum test; Pearson's Chi-squared test; Wilcoxon rank sum exact test