

EP185

RELATIVE EFFECTS OF VARIOUS FACTORS ON ICE BALL FORMATION AND ABLATION ZONE DURING ULTRASOUND-GUIDED PERCUTANEOUS CRYONEUROLYSIS

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Background and Aims Ultrasound-guided percutaneous cryoneurolysis provides analgesia using cold temperatures to reversibly ablate peripheral nerves. Cryoneurolysis probes pass a gas through a small internal annulus, rapidly lowering pressure and temperature, and forming an ice ball to envelope the target nerve. Analgesia is compromised if a nerve is inadequately frozen, and laboratory studies suggest that pain may be paradoxically induced with a magnitude and duration in proportion with incomplete ablation.

Methods A cryoprobe (PainBlocker, Epimed International, Dallas, Texas) was inserted into a piece of meat, a gas passed through for 2 minutes, and resulting ice ball width (cross-section) and length (parallel axis) measured using ultrasound with temperature evaluated in 9 concentric locations concurrently.

Results Greatest influence on ice ball size was probe gauge: change from 18 to 14 increased ice ball width, length, and volume by up to 70%, 113%, and 512%, respectively, with minimum internal temperature decreasing as much as from -5°C to -32°C. In contrast, alternating the type of meat (chicken, beef, pork) and the shape of the probe tip (straight, Coude) effected ice ball dimensions to a negligible degree. Ice ball dimensions and the zone of adequate temperature drop were not always correlated, and even within a visualized ice ball the temperature was often inadequate to induce Wallerian degeneration.

Abstract EP185 Table 1 Factors and ice ball dimensions as well as minimum temperature. The lowest temperatures at the tip of the probes are presented, with minimum temperatures higher than -20°C denoted in red

Table 1. Factors and ice ball dimensions as well as minimum temperature. The lowest temperatures at the tip of the probes are presented, with minimum temperatures higher than -20°C denoted in red.

Factor	Temp	Muscle	Shape	Crease	Gauge	End	Gas	Lowest ice temp	Width		Length		Volume	
									mm	Change	mm	Change	mm ³	Change
Temperature	37°C	Pork	Straight	Yes	14	Trocar	N ₂ O	-15°C	9.8	14%	10.8	40%	543	83%
	20°C							11.2	15.1	991				
Medium	20°C	Beef	Straight	Yes	14	Trocar	N ₂ O	-28°C	11.2	0%	16.0	0%	1050	0%
		Chicken						-32°C	11.2	16.0	1050			
		Pork						-32°C	11.2	0%	15.1	-6%	991	-6%
Shape	20°C	Pork	Coude	Yes	14	Trocar	N ₂ O	-29°C	11.1	1%	14.7	3%	948	4%
			Straight					-32°C	11.2	15.1	473			
Crease	20°C	Pork	Straight	No	14	Trocar	N ₂ O	-14°C	9.7	15%	9.6	57%	473	110%
				Yes				-32°C	11.2	15.1	991			
				No				-16°C	6.2	5.9	119	36%		
				Yes				-5°C	6.6	7.1	162			
Gauge	20°C	Pork	Straight	No	18	Trocar	N ₂ O	-16°C	6.2	56%	5.9	63%	119	298%
				Yes				-14°C	9.7	9.6	473			
				No				-5°C	6.6	7.1	162	512%		
				Yes				-32°C	11.2	15.1	991			
				No				-12°C	7.6	8.6	260	101%		
				Yes				-18°C	10.3	9.4	522			
End	20°C	Pork	Straight	Yes	14	Trocar	N ₂ O	-18°C	10.3	9%	9.4	61%	522	90%
								-32°C	11.2	15.1	991			
Gas *	20°C	Pork	Straight	Yes	14	Trocar	N ₂ O	-33°C	7.7	10%	10.0	14%	310	42%
								CO ₂	-24°C	8.6	11.4	441		

Conclusions Percutaneous probe design can significantly influence the effective cryoneurolysis zone; visualizing a nerve fully encompassed in an ice ball does not guarantee adequate treatment to induce desired Wallerian degeneration. How specific temperatures transfer from pieces of meat to the human body remains unknown.

EP186

INTEROBSERVER RELIABILITY OF SONOGRAPHIC MEASUREMENT OF INFERIOR VENA CAVA AND AORTA PARAMETERS IN FASTING CHILDREN IN THE PERI-OPERATIVE PERIOD: A PROSPECTIVE OBSERVATIONAL STUDY

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Background and Aims Inferior vena cava and Aortic measurements and indices like IVC and Aorta diameter, collapsibility index, distensibility index etc are established parameters for intravascular volume assessment in adults. Literature in pediatric patients is scanty especially in the perioperative setting. This study was planned to evaluate the inter-observer reliability of ultrasound measurements of the IVC and Aortic diameters using the sub-xiphoid trans-abdominal long axis (SXTL) view in fasting pediatric patients, both during spontaneous and controlled ventilation.

Methods After institutional ethics approval and informed consent 50 patients, aged 1 to 12 years, were assessed for intravascular volume indices during spontaneous ventilation and controlled ventilation by two blinded observers, one experienced in ultrasound and one trainee using the SXTL view.

Results The inter-observer reliability for SXTL view was assessed using intraclass correlation coefficient (ICC) and was found to be excellent to good. The ICC for the maximum IVC diameter (IVC max) during spontaneous ventilation was 0.879 (0.787-0.931), for minimum IVC diameter (IVC min) was 0.708 (0.485-0.834) and for maximum aorta diameter (Ao max) was 0.695(0.459-0.827). The ICC for IVC max during controlled ventilation was 0.866 (0.758-0.925), for IVC min was 0.851(0.735-0.915) and for Ao max was 0.866 (0.765-0.924).

Conclusions There was good inter-reliability for measuring the diameter of IVC and aorta during both spontaneous and controlled ventilation, using the SXTL view. After a short training session, a trainee can reliably measure the diameter of these vessels using this view.

ePoster session 6 – Station 2

EP187

COMPARISON OF BLOCK CHARACTERISTICS AND OUTCOMES IN OPIOID BASED AND OPIOID FREE THORACIC CONTINUOUS SPINAL ANAESTHESIA IN PATIENTS UNDERGOING MAJOR ABDOMINAL SURGERY: A DOUBLE BLINDED RANDOMIZED CONTROL TRIAL."

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Background and Aims Thoracic continuous spinal anaesthesia (T-CSA) is emerging as a sole anaesthetic for major abdominal surgeries due to its better perioperative outcomes. The present study is designed to evaluate block characteristics and outcomes in opioid-based (Bupivacaine with Fentanyl-group BF) versus opioid-free (Bupivacaine alone- group B), T-CSA for

major abdominal surgeries in a doubled blinded randomized control trial.

Methods Patients were randomized into B and BF groups. The outcomes measured were peri-operative rescue opioid requirement, opioid-related side effects, dose of bupivacaine required to achieve T4 level, pain scores, conversion to general anaesthesia, hemodynamic stability, patient and surgeon satisfactions, gut motility, length of hospital stays, in-hospital morbidity and mortality

Results A total of 50 patients underwent T-CSA technique, 25 in each group. The opioid based group performed significantly better compared to bupivacaine alone group with respect to decreased intrathecal bupivacaine requirement [induction (p=0.012) and maintenance (p=0.031)], post-operative rescue fentanyl requirement (p=0.018), pain scores at rest at 0, 18, 24 hours and patient satisfaction (p =0.032) at the cost of increased post-operative nausea and vomiting (PONV)

Conclusions Opioid based T-CSA reduced postoperative rescue analgesia requirement, improved patient satisfaction and better postoperative analgesia with manageable PONV when compared with bupivacaine alone group. But both groups, provided equal surgical anaesthesia conditions. We did not observe single morbidity, re-exploration, re-admission and in hospital mortality in any of groups. However, more studies with the larger sample size and different optimal combinations of drugs are required to establish the role of CTSA in major abdominal surgery.

EP188

SERRATUS ANTERIOR PLANE BLOCK FOR MINIMAL INVASIVE CARDIAC SURGERY: A SUBGROUP ANALYSIS OF A SINGLE CENTER RANDOMIZED- CONTROLLED TRIAL

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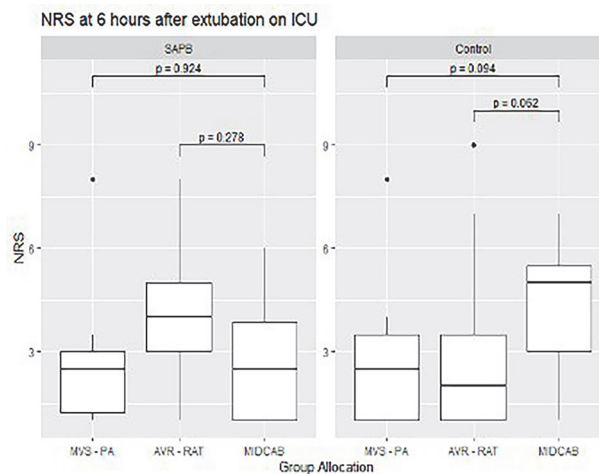
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Background and Aims Regional anesthesia for minimal invasive cardiac surgery (MICS) gained interest as part of Enhanced Recovery After Cardiac Surgery (ERACS) protocols. At our institution, mitral valve surgery through port access (MVS-PA), aortic valve replacement via right anterior thoracotomy (AVR-RAT) and minimally invasive direct coronary artery bypass (MIDCAB) surgery are regularly performed MICS procedures. This study aims to investigate whether the addition of a single-shot SAPB to the standard institutional practice reduces NRS in MICS patients.

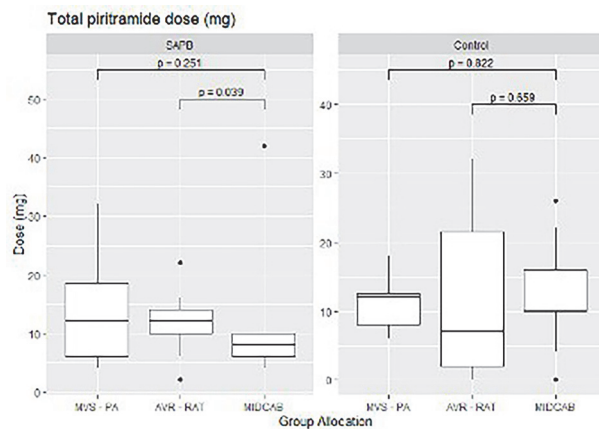
Methods After obtaining consent, 80 MICS patients were randomized to receive either an additional SAPB after surgery (levobupivacaine 0.25%, dosed at 1.25 mL/kg) or IV piritramide as per protocol alone. The primary outcome is Numeric Rating Scale (NRS), 6 hours after extubation. Secondary outcome measure is total piritramide consumption in the ICU. A subgroup analysis per MICS procedure is performed.

Results In the SAPB group (n = 42), MIDCAB patients had a significant NRS reduction of nearly 2 points (difference: 1.71; 95% CI: 0.412 - 2.945; p = 0.023). In the SAPB group,

postoperative opioid consumption was reduced by 2.3 mg; however, the 95% CI spans 0 (-3.948 - 7.344; p = 0.048).



Abstract EP188 Figure 1 NRS at 6h



Abstract EP188 Figure 2 Total piritramide dose

Abstract EP188 Table 1 Demographics

	SAPB group (n = 42)	Control group (n = 38)	
Age (median (IQR))	69,5 (13,75)	67 (10,75)	p = 0,765
Sex – male (n (%))	27 (49,1 %)	28 (50,9 %)	χ ² - p = 0,51
Sex – female (n (%))	15 (60 %)	10 (40 %)	
BMI (mean (95%CI))	26,3 (18,71 – 33,87)	26,4 (19,43 – 33,39)	p = 0,888
Smoking (n (%))	6 (14,3 %)	4 (10,5 %)	χ ² - p = 0,866
Euroscore-II (% , median(IQR))	1,23 (0,78 – 1,57)	0,93 (0,7 – 1,49)	p = 0,461

Conclusions In patients undergoing a MIDCAB procedure, our study demonstrates adequate pain relief when a superficial SAPB is performed. Reported pain scores at 6h and piritramide consumption were lower during ICU stay. Future research needs to investigate the added value of the SAPB in the recovery of MICS patients.

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