

## 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 mm	Width Change	Length mm	Length Change	Volume mm <sup>3</sup>	Volume Change
Temperature	37°C	Pork	Straight	Yes	14	Trocar	N <sub>2</sub> O	-15°C	9.8	14%	10.8	40%	543	83%
	20°C							-32°C	11.2	15.1	991			
Medium	20°C	Beef	Straight	Yes	14	Trocar	N <sub>2</sub> O	-28°C	11.2	0%	16.0	0%	1050	0%
		Chicken						-38°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 <sub>2</sub> O	-29°C	11.1	1%	14.7	3%	948	4%
			Straight					-32°C	11.2	15.1	991			
Crease	20°C	Pork	Straight	No	14	Trocar	N <sub>2</sub> 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 <sub>2</sub> 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			
				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 <sub>2</sub> 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 <sub>2</sub> O	-33°C	7.7	10.0	310			
							CO <sub>2</sub>	-24°C	8.6	11.4	441	42%		

**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