TITLE: ESTIMATION OF ISCHEMIC TERRITORY BY CONTINUOUS VECTORCARDIOGRAPHY IN A CLOSED CHEST MYOCARDIAL INFARCTION MODEL.

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The size of ischemic territory during an evolving myocardial infarction (RZ) is a major determinant for final infarct size and prognosis. Reliable non-invasive methods to quantitate RZ are not available. We have evaluated the ability of continuous vectorcardiography (MIDA 1000, Ortivus Medical AB, Täby, Sweden) to estimate and predict RZ during experimental coronary occlusion. Our hypotheses were (1): the magnitude of change in the spatial ST vector (STC-VM) during the initial phase of a myocardial occusion reflects RZ and (2) RZ can be predicted from the STC-VM change during the early occlusion period.

After approval by the national ethics committee for animal research, 41 pigs were anesthetized with a continuous infuction of pentobarbital and mechanically ventilated with oxygen enriched air to a stable normal end-tidal carbon dioxide tension. Coronary occlusion was established by injection of a 2 mm teflon coated lead ball via an angiography catheter directed into either of the three main coronary arteries. Cerium-141 microspheres were injected during occlusion for post-mortem delineation of RZ in autoradiograms. In 20 pigs, the occlusion was sustained for 24 hours. 21 animals were reperfused after 60 min (n=15) or 90 min (n=5) by retraction of the ball via a thin surgical filament. Reperfusion was continued up to 24 hours after occlusion.

Seven animals were excluded due to ventricular fibrillation (n=5) or technical problems. Conventionel regression analysis demonstrated a good correlation between STC-VM and RZ regardless of artery occluded (r= 0.83 to 0.91, $p<0.001$). Partial least square regression analysis demonstrated that six ST-variables recorded during the first 60 min of occlusion significantly reflected the size of RZ (measured as % of total heart weight). STC-VM over the first 30 min of coronary occlusion predicted RZ measured by microspheres (RZ = 1.04xSTC-VM - 0.21, r=0.82, $p<0.001$, n=34).

It is concluded that changes in ST vector magnitude during the early period of myocardial ischemia produced by coronary artery occlusion can be used to estimate the mass of ischemic territory.

References

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TITLE: DOES LIQUID CRYSTALLINE TEMPERATURE MONITORING ESTIMATE CORE TEMPERATURE IN ANESTHETIZED CHILDREN?

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Pediatric anesthetists are faced daily with the task of maintaining body temperature in their patients. Implicit in this task is the accurate measurement of core temperature with the use of noninvasive monitors. Various sites, invasive and noninvasive, have been used to measure temperature. Core temperature sites like esophageal, rectal, axillary and tympanic membrane (gold standard)[1] have been used. Liquid Crystalline Temperature (LCT) strips have been utilized since 1978 to measure temperature intraoperatively and have been met with varying enthusiasm.[2,3,4] This study was designed to evaluate the accuracy of corrected forehead LCT strip in estimating core temperature in anesthetized infants and children.

After approval from our Ethics Committee, 100 ASA I or II infants and children undergoing elective surgery were studied. All patients were fasted and unpremedicated. Anesthesia was induced with thiopentone 5mg/kg, vecuronium 0.1 mg/kg, and fentanyl 2 mcg/kg. After the trachea was intubated, anesthesia was maintained with either a caudal or lumbar epidural and isoflurane, 0.5-1.5 MAC. Standard temperature conservation methods were used, including passive humidification and a warming blanket. After induction, an estimated core temperature LCT strip with an upward correction factor of 2.2°C was placed on the forehead. Thermocouple probes were used to measure tympanic, axilla, rectal, oesophageal, finger, forearm, and forehead (on the right and left side of the LCT strip) temperature. Recordings of temperature were made every ten minutes for the first 100 minutes of the surgery. Demographics are reported as means ± S.D. Differences between and within groups were compared using ANOVA and SNK tests for multiple comparisons. Statistical significance ($p<0.05$) was accepted.

The mean (±S.D.) age and weight was 55.0±45.8 mo and 20.1±14.7 kg, respectively. Mean LCT differed significantly from all measured core sites ($p<0.001$) (fig 1). Mean LCT was ≈1.1°C greater than tympanic temperature (*$p<0.001$) while forehead Right and Left were ≈2.3°C less than tympanic temperature (*$p<0.0001$) (fig 2). After subtraction of the correction factor (2.2°C), mean LCT was ≈1.1°C less than and statistically different from tympanic temperature (*$p<0.001$). Even after subtracting the compensation factor, the LCT failed to estimate forehead Right and Left (+$p<0.001$) (fig 2).

Our findings showed that during normothermia compensated LCT failed to estimate core temperature. Previous investigators have shown good correlation between tympanic, esophageal, rectal, and axillary temperatures in pediatric patients.[5] Indeed, our data validates these findings. The failure to even estimate forehead temperature makes the compensated LCT strip unreliable as a sole measure of core temperature.

We thank Sharn Inc. for providing the LCT strips.

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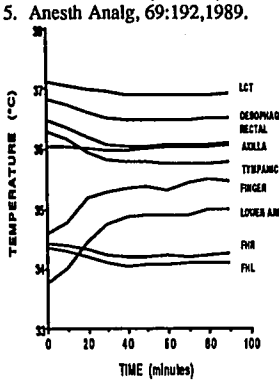

fig 1

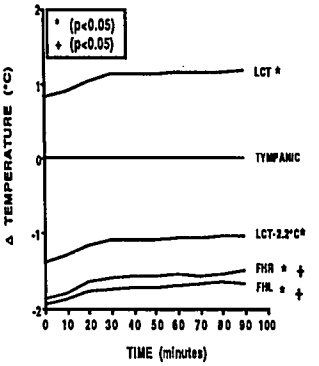

fig 2