

**MAPPING-GUIDED SURGICAL THERAPY OF REFRACTORY VENTRICULAR TACHYCARDIA (VT) DUE TO CORONARY ARTERY DISEASE.**

Jay W. Mason MD, FACC, Edward B. Stinson MD, FACC, Philip E. Oyer MD, PhD, FACC, Roger A. Winkle MD, FACC and Gerry C. Derby, RN. Stanford University, Stanford, California

Electrical activation sequence mapping was used to guide surgical therapy in 50 patients with medically refractory VT due to prior myocardial infarction. Age of the 45 men and 5 women was  $59 \pm 9$  (SD, range 36 to 73) years. The primary procedure was endomyocardial excision in 31, cryothermal ablation in 13 and transmural or endo-ventriculotomy in 6. Concomitant coronary grafting was done in 24 and mitral valve replacement in 3. Mean follow-up is 268 (range 1 to 768) days. Fifteen patients (30%) have died. Death resulted from left ventricular (LV) failure in 8, a stroke in 1, and exsanguination in 1. Three died of documented arrhythmia recurrence at 1, 6 and 24 days and two had sudden, presumed arrhythmic, deaths at 75 and 157 days. By actuarial analysis  $79 \pm 6$  (SEM)% at 1 month,  $69 \pm 7\%$  at 6 months, and  $66 \pm 7\%$  at 11 through 25 months survived. A total of 11 (22%) have had documented or suspected post-operative VT recurrence. Six additional patients (12%) had inducible VT before discharge but have not had spontaneous recurrence; 4 of them are receiving antiarrhythmics. Actuarial analysis shows  $87 \pm 5\%$  at 1 month,  $75 \pm 7\%$  at 5 months and  $71 \pm 8\%$  at 10 through 25 months to be free of VT recurrence.

Of the 13 patients who underwent cryoablation, only 1 died of LV failure; one died suddenly and 1 died with refractory ventricular tachycardia.

We conclude: (1) Mapping-guided surgical therapy of medically refractory VT is associated with compromise of LV function in some patients. (2) Mapping-guided surgery provides long-term arrhythmia prophylaxis in most patients. (3) Cryothermal ablation is probably as effective and may be less damaging to the LV than endocardial incision or excision.

**TUESDAY, APRIL 27, 1982**

**AM**

**CORONARY ANGIOGRAPHY AND CORONARY BLOOD FLOW 10:30-12:00**

**ANGIOGRAPHIC AND FUNCTIONAL CORRELATION IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION.** Arturo Cortina MD, J Prieto-Granda MD, Fernando Torre MD, Augusto D. Pichard MD, FACC, Ciudad Sanitaria Oviedo, Facultad de Medicina, Spain.

Acute myocardial infarction (AMI) can be the first manifestation of coronary disease or can be preceded by a long history of angina pectoris. To determine whether the anatomic substrate is different in these 2 groups, we studied the coronary anatomy and LV function in 70 consecutive patients (pts) who underwent angiography 1-4 weeks after AMI: 40 pts had AMI as first manifestation of coronary artery disease (Gr I) and 30 pts had a long history of angina pectoris prior to MI (Gr II).

**Results:** Gr I vs Gr II respectively: Anterior MI 72.5% vs 43.2% †; inferior MI 27.5% vs 56.3%†; normal LV function 10% vs 50%\*; hypokinesis 40% vs 33.3% (NS); akinesis or dyskinesis 50% vs 16.6%\*; Friesinger coronary score 5.3 vs 8.5; collaterals present 15% vs 76.7%\*; collaterals absent 85% vs 23.3%\*.

\*  $p < .005$  Gr I vs Gr II.

†  $p < .02$  Gr I vs Gr II.

**In conclusion,** pts who develop an acute myocardial infarction without prior angina pectoris appear to have a different anatomic substrate than those with prior angina. They have anterior MI more often and remain with more LV dysfunction, they have less extensive coronary disease, and less collateral circulation. We propose the hypothesis that MI in Gr I may occur as a result of slow progression of atheroma and that MI in Gr II may be the result of rapid progression of occlusion (superimposition of thrombosis, spasm or hemorrhage).

**REGIONAL ELECTROPHYSIOLOGIC AND RHEOLOGIC EFFECTS OF ENDOCARDIAL CRYOABLATION**

Ross M. Ungerleider, MD; David Calcagno, BS; Masatoshi Ikeshita, MD; William L. Holman, MD; J. Mark Williams, MD; Peter K. Smith, MD; Gary K. Lofland, MD; James L. Cox, MD; Dept. of Surgery, Duke University, Durham, North Carolina

Cryoablation of the ventricular endocardium (CAVE) has been introduced recently as a method for treating refractory ventricular tachycardia. This study was designed to determine the effects of CAVE on local electrophysiology and regional myocardial blood flow (RMBF). Ten dogs underwent cardiopulmonary bypass and multiple epicardial, intramural, and endocardial electrodes were positioned in the left ventricular free-wall. RMBF was determined using  $^{86}\text{Rb}$  radioactive tracer microspheres. Four-5 cm<sup>2</sup> of the endocardium was cryoablated at -50°C for 2 minutes. Interelectrode conduction time was increased by 20% ( $p < 0.008$ ) within the cryolesion (CL) and by 24% ( $p < 0.0001$ ) across its borders, while conduction in adjacent normal myocardium remained unchanged. Total electrical activity was ablated in 39% (12/31) of subendocardial electrograms within the CL but not in the overlying subepicardium. Subendocardial RMBF within the CL decreased by 84% but remained unchanged in adjacent subepicardium. Endocardial cryoablation results in local electrophysiologic changes similar to those produced by an encircling endocardial ventriculotomy (EEV), with the advantage of sparing the RMBF to adjacent myocardium. Although the long-term effectiveness of endocardial cryoablation for the treatment of refractory ventricular tachycardia remains to be determined, it is safer, more rapid, and less destructive than other currently employed surgical procedures.

**SENSITIVITY OF QUANTITATIVE SEGMENTAL WALL MOTION ANALYSIS OF REST AND EXERCISE VENTRICULOGrams IN DETECTING CORONARY ARTERY DISEASE**

Harry T. Colfer, MD; Ka S. Lo, MD; Joseph A. Walton, Jr., MD; Andrew J. Buda, MD; Bertram Pitt, MD, University of Michigan, Ann Arbor, Michigan.

Segmental LV wall motion analysis has been proposed as a useful technique for evaluating the LV for evidence of coronary artery disease (CAD). To assess the sensitivity of segmental analysis of LV wall motion as compared to the global ejection fraction (EF) to detect CAD, 65 patients undergoing diagnostic cardiac cath had right anterior oblique (RAO) contrast LV grams at rest and immediately following symptom limited exercise with a bicycle ergometer. The EF (area-length method) and quantitative regional wall motion (normalized segmental area contraction) were calculated by computer from light pen tracings of the LV grams. Twelve patients had normal coronary arteries. Four patients had one or more vessels 50-70% occluded and 49 patients had one or more vessels 70-100% occluded. The EF and segmental wall motion for the 53 patients with CAD were considered abnormal if they fell 2 standard deviations below the mean for the normal coronary group.

	# Abnormal	% Sensitivity
Rest EF	7	13
Rest wall motion analysis	20	37
Change in EF with exercise	41	77
Exercise wall motion analysis	41	77
Rest-exercise EF & wall motion	50	94

The 3 patients not detected by rest-exercise EF and wall motion analysis had right single vessel CAD.

**CONCLUSION:** Quantitative analysis of resting LV wall motion is more sensitive than measurement of EF for detecting CAD from a single plane RAO ventriculogram. Rest-exercise EF and wall motion analysis detects all but single right CAD which may involve the RV rather than the LV.