

### 859 Long-Term Effect of Intervention to Reduce Myocardial Ischemia

Tuesday, March 31, 1998, 4:00 p.m.-5:30 p.m.  
Georgia World Congress Center, Room 364W

4:00

### 859-1 Clinical Results and Revascularization Status Five Years Following Randomization to PTCA or CABG in Bypass Angioplasty Revascularization Investigation (BARI)

E.L. Alderman, M.G. Bourassa, P.L. Whitlow, R.M. Califf, L. Schwartz, K.E. Kip. *Stanford University, Stanford, CA; University of Pittsburgh, Pittsburgh, PA, USA*

**Background & Methods:** Out of a consecutive series of 512 patients (pts) at 4 of 18 clinical sites, 407 (79%) had 5 yr follow-up angiography to relate angiographic disease to clinical outcome. Compared with the other 1208 surviving pts in BARI, 5 yr angio pts were younger, had less 3 vessel disease with fewer total occlusions and had better LV function with less CHF. Pts having PTCA or CABG were similar, with 34% having 3 vessel disease (3.3 lesions  $\geq$  50%/pt) and 60.1% mean jeopardized myocardium (MyoJep) per pt, estimated as % of LV territory distal to  $\geq$  50% lesions.

**Results:** For 202 PTCA treated pts, there were 232 initial procedures attempting 2.6 lesions/pt with 82% initial lesion success ( $\geq$  50%). Of those pts, 53.6% had additional procedures (PTCA: 39.6%, CABG: 20.8%). Of all 522 initial and 59 incremental attempted lesions/pt, 78.8% were  $\geq$  50% at 5 yrs. Among pts with initially successful PTCA ( $\geq$  1 lesion successfully treated), 41% required retreatment by PTCA or CABG. For 200 CABG treated pts, there were no additional CABGs and 17 PTCA. Of 334 vein grafts restudied, 87% were patent and 84% were free of lesions  $\geq$  50%. Of 198 mammary grafts restudied, 95% were patent and 89% were free of lesions  $\geq$  50%. MyoJep fell from 60.1% to 19.5% at 5 yrs in CABG pts and to 24.8% in PTCA pts ( $p < 0.01$ ). Of 289 pts with MyoJep  $\geq$  33% at 5 yrs, 20.4% of PTCA pts vs. 17.2% of CABG pts had angina (NS). Of 118 pts with MyoJep  $<$  33%, 41.4% of PTCA pts vs. 22.9% of CABG pts had angina ( $p = 0.05$ ). Regression analysis showed 5 yr MyoJep, severe angina at entry and smoking history in rank order to be associated with angina at 5 yrs.

**Conclusion:** For pts surviving 5 yrs, CABG yielded 9.2 percentage points less angina than PTCA, a result consistent with the 5.3 percentage point difference in MyoJep.

4:15

### 859-2 Results of the Multicenter Study of Enhanced External Counterpulsation (MUST-EECP): Clinical Benefits are Sustained at a Mean Follow-up Time of One Year

R. Arora, T. Chou, D. Jain, R. Nesto, B. Floishman, L. Crawford, T. McKlemm. *For the MUST-EECP investigators: Columbia University, New York, USA*

**Background:** In May 1997 enrollment concluded in the first national, multicenter, randomized, placebo-controlled trial of enhanced external counterpulsation (EECP), a non-invasive therapy for pts with coronary artery disease (CAD) and chronic angina pectoris (AP).

**Methods:** Between 1995 and 1997, 139 pts were enrolled (mean age 63, range 35-81 yrs), 57% had coronary artery bypass surgery and/or angioplasty, 49% had prior myocardial infarctions, 74% were in Canadian Class 2 or 3, and 56% had "residual" multivessel CAD despite revascularization. Pts were randomized to active counterpulsation (AC) or inactive (sham) counterpulsation (IC) for 35 hrs of outpatient therapy over a 4-7 week period. Pre- and post-counterpulsation EX tests and first-and-last week anginal diaries were analyzed in a blinded fashion. Using mail and telephone follow-up procedures, 80 pts who were at least 3 mos post treatment were contacted.

**Results:** Baseline clinical and angiographic characteristics were similar in the AC and IC groups. AC resulted in a significant increase in EX duration and in time to onset of ischemic ST depression and a decrease in weekly anginal episodes. IC resulted only in increased EX duration. No serious complications occurred in either the AC or IC groups. Eighty patients were contacted during the followup period, 40 in each group. Mean followup time was 11.7 and 12.1 mos respectively (pNS) with a mean followup of 11.9 mos for the total group. Hospitalization rates for both groups were not significantly different (9/40 vs 5/40) but improvement in symptoms was more significant in the AC group (28/40 vs. 15/40,  $p < 0.01$ ).

**Conclusion:** In addition to significant immediate improvement in ischemic parameters, beneficial clinical effects were present 1 yr after treatment in 70% of pts undergoing EECP.

### 859-3 Percutaneous Myocardial Revascularization, a New Approach to Patients With Intractable Angina Pectoris

B. Lauer, U. Junghans, F. Stahl, E. Brennan, S. Oestler, G. Schuler. *Heart Center, Leipzig, Germany; Stanford University, Palo Alto, CA, USA*

**Background:** Transmyocardial laser revascularization (TMLR) in patients with coronary artery disease and intractable angina pectoris is associated with considerable perioperative morbidity and mortality. Therefore, a catheter-based system was developed for laser revascularization of the myocardium from the left ventricular cavity.

**Methods:** 16 Patients (P) (64.3  $\pm$  5.7 years) with severe coronary artery disease not amenable to bypass grafting or coronary angioplasty were treated with percutaneous myocardial revascularization (PMR). Scintigraphic evidence of ischemia was demonstrated in the anterior wall in 10 P, in the lateral wall in 3 P and in the inferior wall in 4 P (1 P had ischemia in the anterior and the inferior wall).

**Results:** PMR was successfully performed in all P. 11.8  $\pm$  3.0 (7-15) laser channels were created per region treated. Creatine kinase levels rose from 72  $\pm$  21 U/l to 158  $\pm$  40 U/l. Minor adverse effects were a non-sustained ventricular tachycardia in 1 P and a small pericardial effusion (2 mm) in 1 P detected by echocardiography not requiring drainage. After 3 months, Canadian Cardiology Society - class had improved 1 or 2 classes in 6/7 P. Exercise time on bicycle exercise test increased from 6.0  $\pm$  4.0 to 8.7  $\pm$  4.5 min (not significant). Scintigraphically, 14/28 ventricular segments treated with PMR had improved perfusion, 3 segments had deteriorated and 11 segments were unchanged.

**Conclusion:** PMR is a safe and feasible technique. There were no serious complications in the first P. PMR seems to relieve angina pectoris similar to TMLR, preliminary data suggest a trend towards increased exercise capacity and improved regional perfusion.

4:45

### 859-4 Correlates of Cardiac Death Early After Hospital Discharge in Patients who Have Undergone Percutaneous Treatment of Unprotected Left Main Stenoses - What Are the Lessons?

S. Ellis, M. Nobuyoshi, H. Tamai, T. Plokker, S.-J. Park, T. Suzuki. *Cleveland Clinic Foundation, Cleveland, OH, USA*

Concern has been raised about the risk of early ( $\leq$  9 mos) cardiac death (ECD) after patient (pt) discharge from hospital after percutaneous rx of unprotected left main stenoses (ULMS). To evaluate the incidence and correlates of ECD we queried a registry of 262 consecutively treated pts from 25 centers rx'd since 1/94. Pts with definite non-cardiac cause of death were excluded (n = 4). 9% of pts had ECD (6 MI including 2 stent thrombosis, 4 sudden, 2 during rx of stenosis, 4 other). Odds ratios (OR) for correlates of ECD with univariate  $p < 0.10$  are shown.

	Univariate OR	Multivariate OR	P value
LVEF $<$ 30%	12.44	17.09	0.001
Not CABG candidate	10.50	-	
Creatinine $\geq$ 2 mg%	4.46	-	
Prior bypass surgery	3.02	-	
Rest/progressive angina	3.09	4.26	0.028
DCA	-	0.69	0.65
Stent	-	0.72	0.62
PTCA	-	3.54	0.13

Age, diabetes, lesion morphology, post-rx  $\geq$  stenosis and Ticlopidine use had  $p \geq 0.10$ . Pts with  $>$  1 risk factors (†) and stent or DCA had ECD = 15%, with neither ECD = 3.2%. ECD after percutaneous ULMS rx remains fairly common, difficult to predict, and the primary reason to be cautious about percutaneous rx of ULMS.

5:00

### 859-5 Has the Prognosis for Left Main (LM) and Left Main Equivalent (LMEQ) Coronary Disease Changed: Analysis of a Long Waiting List

J.M. Elliott, N.W. Jackson, M.P. Doogue, D.W. Smyth. *Christchurch Hospital, Christchurch, New Zealand*

**Background:** The long waiting times for coronary bypass surgery (CABG) in New Zealand enable analysis of outcomes on medical therapy in patient groups that receive early CABG in other countries.

**Methods:** We have reviewed clinical characteristics at referral and outcomes while waiting in 412 consecutive patients referred from our institution