are controversial and the ability of preop ischemia severity to predict events after CABG has not been defined. Accordingly, we followed 47 consecutive clinically stable MED pts with angiographically documented 2-v CAD who previously had undergone rest and ex RNCA and compared their course with a parallel group of 37 consecutive pts who underwent CABG after RNCA without known intercurrent ischemic event. All pts had LVEF ≥ 30% at rest. During av 10 ± 4 yr followup, initial CE included 7 deaths (CD) and 7 nonfatal myocardial infarctions (MI) among MED pts vs 1 CD and 5 MI among those with CABG. For the entire pop, CABG tended to cause a decrease in CD ($p < 0.06$ vs MED). However, this finding masked important subgroup differences: in pts whose LVEF fell 5% or more from rest to ex (Δ LVEF ≤ −5%), CABG significantly improved survival (av annual CD risk [AAR]:0.6%[CABG] vs 4.0%[MED], $p < 0.04$). In contrast, CABG produced no survival benefit among pts with no or less severe ischemia (Δ LVEF > −5%), all of whom remained free of CD irrespective of treatment. CABG also tended to reduce total CE rates (including MI) for pts with preop Δ LVEF ≤ −5% (AAR:2.2%[CABG] vs 6.3%[MED], $p = 0.07$), but among pts with Δ LVEF > −5%, CABG had no impact on CE (AAR:1.4%[CABG,MED],NS). Thus, preop ischemia severity predicts CABG-mediated prolongation of survival and event reduction in pts with 2-v CAD. Determination of ischemia may inform selection of pts with 2-v CAD for CABG.

11:15

707-4 Direct Comparison of FDG SPECT With Stress-Reinjection Thallium SPECT and Dobutamine Echocardiography for Predicting Regional Improvement After Revascularization

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The aim was to compare 3 techniques to predict functional outcome after revascularization (R). Seventeen patients (mean EF 38 ± 11%) with chronic coronary artery disease (CAD) were studied prior to surgical R. Regional function was evaluated before and 3 months after R by echo (13-segment model). Regional FDG uptake (during hyperinsulinemic glucose clamp) was compared with resting perfusion assessed with early Tl-201 (Tl) SPECT. All SPECT data were analyzed quantitatively. On FDG SPECT, viability was defined as normal perfusion or mismatch (≥ 7% increased FDG uptake relative to Tl). For Tl stress-reinjection, viability was defined when there was normal uptake, (partially) reversible uptake or irreversible mild fixed uptake (> 50% of normal activity). Dyssynergic segments were considered viable on echo in presence of improved wall thickening during dobutamine (10 μg/kg/min) infusion. Improvement of regional function was observed in 27 of 92 successfully R segments.

	FDG sens/spec (%)	Tl-reinj sens/spec (%)	DE sens/spec (%)
All segm	89/77	93/43	88/63
Akinetic	78/80	78/69	67/93
Hypokinetic	94/67	100/22	94/39

Logistic regression showed that in akinetic segments FDG was the best predictor for recovery and that in hypokinetic segments the combination of FDG and DE yielded the most accurate prediction for functional recovery. Integration of metabolic and functional data is necessary, particularly in hypokinesia, for the optimal prediction of improvement of regional function in patients with CAD.

11:30

707-5 Coronary Vasodilatory Capacity and Flow Reserve Are Attenuated in Normal Myocardium Supplied by Bypass Grafts

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Invasive studies demonstrated a normal or attenuated flow velocity increases in patent bypass grafts (CABG) in response to pharmacologic vasodilation. However, the hyperemic flow response of normal myocardium subtended by CABG has not been studied. Also, it is unknown if pharmacologic vasodilation evokes comparable hyperemic responses in arterial and venous CABG. Therefore, myocardial blood flow (MBF) and flow reserve (FR) were quantified at rest and during dipyridamole hyperemia in normal myocardium (polar map analysis) supplied by arterial (n = 10) and venous CABG (n = 15) in 14 patients (66 ± 6 years) at 8 ± 4 years after surgery with N-13 ammonia and PET. Ten healthy individuals (62 ± 6 years) served as controls. Rate pressure products (RPP) were similar in patients and controls at baseline (7851 ± 1299 vs 7606 ± 2292) and during dipyridamole (10118 ± 2532 vs 10424 ± 1799; p = NS). Accordingly, MBF at rest did not differ (0.65 ± 0.16 vs 0.68 ± 0.16 ml/g/min; p = NS) and was correlated to RPP in both groups ($y = 8.07E-5x + 0.02$; $r = 0.66$; $p = 0.01$ and $y = 11090.28x + 75.2$; $r = 0.77$; $p < 0.02$). The hyperemic MBF response in normal myocardium supplied by CABG was less than in controls (1.62 ± 0.33 vs 2.02 ± 0.32 ml/g/min; $p < 0.01$). Hyperemic MBF was similar in normal myocardium supplied by arterial and venous grafts (1.65 ± 0.29 vs 1.62 ± 0.35 ml/g/min; p = NS). The similar resting MBF together with the blunted hyperemic response resulted in a lower FR in normal myocardium supplied by CABG than in controls (2.54 ± 0.49 vs 3.12 ± 0.86 ml/g/min; $p < 0.05$). Thus, the coronary vasodilatory capacity is impaired to a similar degree in normally perfused myocardium subtended by arterial and venous grafts, possibly due to proliferation of vascular smooth muscle cells and intimal thickening altering smooth muscle cell relaxation in response to dipyridamole. Further, an impairment in flow mediated, endothelium dependent coronary vasodilation might contribute to the impaired hyperemic response.

11:45

707-6 Assessment of Coronary Flow Reserve After Stent Implantation Using Positron Emission Tomography

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Numerous stress perfusion studies have demonstrated that coronary angioplasty despite successful dilation of a flow-limiting stenosis fails to normalize coronary flow reserve within several days after the intervention. No data are available following stent placement at the site of balloon dilatation. In 11 patients 1.6 ± 0.9 days after coronary stent implantation myocardial blood flow was measured by N-13 ammonia positron emission tomography at rest and during adenosin induced maximal vasodilation. The coronary reserve (maximal/basal coronary blood flow) was calculated in regions supplied by stented arteries and was compared with that in control regions (CR). All patients had single-vessel coronary disease. Four had a history of previous myocardial infarction (PMI) with preserved left ventricular function. At rest, coronary flow in the vascular territory (VT) of the stented artery did not differ significantly from that in CR (75.0 ± 13.6 and 73.5 ± 14.1 ml/min/100 g, respectively). At maximal vasodilation, the coronary reserve was at least 90% of that in CR in 7 of 11 patients (3.2 ± 0.8, corresponding to 130% ± 5% of the CR). 3 of the 4 patients showing coronary reserve less than 90% of CR had PMI in the stented VT. Repeated coronary reserve determination after 13 days in one of these 3 patients showed no change (73% and 79% of CR, respectively) suggesting a chronic deterioration of vasoregulation due to the previous ischemic injury. Thus, most patients without PMI in the VT of stented arteries show normalised comary reserve within three days after complete revascularisation with stent implantation.

708 Novel Approaches to the Echocardiographic Assessment of Systolic Function

Monday, March 25, 1996, 10:30 a.m.–Noon
Orange County Convention Center, Room F3

10:30

708-1 Automated Diagnosis of Regional Wall Motion Abnormalities Using Segmental Analysis of End-Systolic Color Kinesis Images

Philippe Vignon, Victor Mor-Avi, James Bednarz, Lynn Weinert, Claudia Korcarz, David Prater, Rick Koch, Roberto Lang. *University of Chicago, Chicago IL*

This study evaluated the accuracy of quantitative segmental analysis of Color Kinesis (CK) images to provide objective echocardiographic assessment of LV regional wall motion abnormalities (RWMA). *Methods.* Echocardiograms were obtained in 40 patients with RWMA's and in 20 normal subjects End-systolic color maps were divided into segments using custom software (fig. 1).