

788-2 Myocardial Viability Imaging Using Sestamibi Scintigraphy and F-18 Fluoro-Deoxyglucose (FDG) Positron Emission Tomography Identifies Patients With Greatest Benefit From Coronary Revascularization

Jürgen vom Dahl, Carsten Altehoefer, Petra Büchin, Gernot Schulz, E. Rüdiger Schwarz, Florence H. Sheehan, Udalrich Büll, Peter Hanrath, Univ. of Aachen, Germany; Div. of Cardiology, Univ. of Washington, Seattle, WA

161 patients with coronary artery disease and regional wall motion (RWM) abnormalities (EF 44 ± 15%) who underwent viability imaging using Tc-99m sestamibi scintigraphy and PET with FDG were followed for 29 ± 6 (22–44) months. The target region for viability imaging in each patient was categorized as predominantly scar (group A, n = 90), viable but not compromised (B, n = 26), or ischemically jeopardized myocardium (C, n = 45) in regions considered for revascularization. 63/90 patients in group A were treated medically (group A1), and 27 were revascularized (A2). Revascularization in group B and C was performed in 81% (B2) and 80% (C2). Cardiac (CE) events during follow-up were defined as cardiac death, infarction, late revascularization, or resuscitation. Improvement of angina pectoris according to the C.C.S.-classification (CCS+) at follow-up was defined as change ≥ 1 grade. RWM was analyzed serially using the centerline method in 65/84 patients with coronary revascularization and follow-up angiography after 6 ± 1 months. Δ-RWM represents the change of RWM from baseline to follow-up angiography expressed in SD of a normal reference population.

Group (n)	A1(63)	A2(27)	B1(5)	B2(21)	C1(9)	C2(36)
CE (%)	17	18	20	9	22	0*
CCS+ (%)	25	63†	0	76	11	69*
ΔRWM		-0.1 ± 0.8		0.1 ± 0.4		1.1 ± 0.7**

†p < 0.05 vs. A1, *p < 0.05 vs. C1, **p < 0.01 vs. A2 and B2

Patients revascularized due to symptoms despite evidence for scar tissue improved clinically without change of RWM and no reduction of CE. Patients with preoperative ischemic tissue by viability imaging benefited most with regard to function, symptoms, and events. Thus, viability imaging using sestamibi and FDG provides clinically important information for treatment planning and prognosis.

788-3 I-123 Iodophenylpentadecanoic Acid (IPPA) Metabolic Imaging Predicts Improvement of Global Left Ventricular Function After Coronary Revascularization

Mario S. Verani, Raymond Tallifer, John J. Mahmarian, Zuo-Xiang He, Cesare Oriandi, Ami S. Iskandrian for the IPPA Study Group. Baylor College of Medicine, Houston, TX

We assessed whether viability assessment by IPPA metabolic imaging prior to coronary revascularization (CABG) may assist in guiding therapy in patients (pts) with severe left ventricular (LV) dysfunction. As part of the multicenter IPPA viability trial, a total of 188 pts with ischemic cardiomyopathy scheduled for CABG were studied by rest-redistribution IPPA tomography. Radionuclide ventriculography was performed before and 6–8 weeks after CABG. IPPA distribution as well as global and regional LV function were evaluated in a blinded fashion.

Results: The study was completed by 138 pts (78.4%). Death occurred in 6 pts (8.2%) after CABG. The mean ejection fraction (EF) was 33.4 ± 12.5% prior to CABG and 36.5 ± 12.9 post CABG (p < 0.001). An EF improvement > 10 units was observed in 16.8% and > 5 units in 29.6% of pts after CABG. Initial analysis of rest-redistribution SPECT IPPA images showed that IPPA-viable myocardium (normal IPPA uptake or presence of redistribution) was 75% accurate in predicting EF improvements ≥ 10%. Deterioration of LV function (EF decrease > 5%) occurred in 12% of pts, a likely reflection of perioperative infarction.

Conclusions: Significant improvement of LV-EF occurs in about one-third of pts with ischemic cardiomyopathy undergoing revascularization. Substantial enhancement of LV-EF can be predicted by IPPA metabolic imaging. This potentially enhanced noninvasive viability assessment may help identify the pts most likely to benefit from CABG.

788-4 Myocardial Tc-99m Sestamibi Activity Predicts Recovery of Function After Coronary Bypass Surgery: Correlation With Histopathology

Habib A. Dakik, Donald G. Wellbaecher, Jimmy F. Howell, Rafael Espada, Gerald M. Lawrie, Zuo-Xiang He, Periyaran Vaduganathan, John J. Mahmarian, Mario S. Verani. Baylor College of Medicine, Houston, TX

The use of Tc-99m sestamibi for assessing myocardial viability remains controversial. Accordingly, we performed resting gated radionuclide angiography (RNA) and sestamibi single photon tomography (SPECT) within 48 hours before coronary artery bypass grafting (CABG) in 17 patients with abnormal wall motion and a mean ejection fraction of 42%. During CABG, transmural myocardial biopsies were obtained, fixed and stained for morphometric analysis. RNA was repeated 8 weeks later. In the RNA study, the left ventricle was divided into 10 segments and the wall motion scored as normal, mildly hypokinetic, moderately hypokinetic, severely hypokinetic, and akinetic. Sestamibi count activity was quantified using computer-derived polar maps. A total of 22 segments were biopsied (6 akinetic, 3 severely hypokinetic, 3 moderately hypokinetic, 5 mildly hypokinetic, and 5 normal). There was a strong inverse correlation between extent of histologic fibrosis (assessed by computerized microscopy of trichrome-stained myocardium) and sestamibi activity (r = -0.86, p < 0.001). Nine of 17 (53%) biopsied segments with abnormal wall motion improved their function after CABG. The mean % fibrosis was significantly lower in segments with, than in those without, improved function (8 ± 5% vs 31 ± 14%, p = 0.002). Sestamibi count activity was significantly higher in segments with, than in those without, improved function (81 ± 5% vs 53 ± 15%, p < 0.001). Thus, sestamibi myocardial activity is strongly correlated to extent of myocardial fibrosis and predicts recovery of function after CABG.

788-5 Effect of Preoperative PET Viability on Peri- and Postoperative Risk

Felix Haas, Christoph Hähnel, Fritz Sebening, Hans Meisner, Markus Schweiger. Deutsches Herzzentrum München, Munich, Germany; Technische Universität München, Munich, Germany

Patients (pts) with coronary artery disease and marked LV-dysfunction have increased peri- and postoperative morbidity and mortality. In order to balance the operative risks and long term benefits associated with CABG, it is important to identify pat. who will benefit from CABG. The aim of this study was to examine whether the determination of tissue viability using Positron Emission Tomography (PET) may improve patient selection with consecutive decreased peri- and postoperative complications. Thus far, we have studied 49 pts. with 3-vessel disease and marked LV-dysfunction who underwent CABG. Of these patients, 24 were selected based on clinical status and angiographic data (group A), while 25 also underwent preoperative PET imaging (group B). In group B, 8 of the pts. were previously declined for CABG based on clinical status or angiographic data.

	Group A (no PET)	Group B (PET)
Congestive heart failure	45%	60%
Ejection fraction (%)	28.9 ± 4.8	28.3 ± 5.0
LVedP (mmHg)	20.3 ± 9.5	20.0 ± 11.3
Catecholamines postop.	95.5%	75%
Low-output-syndrome	18.2%	0%
postop. ICU-days	5.9 ± 5.7	3.2 ± 1.4
Readmittance to ICU	13.6%	4.0%
Hospital mortality	12.5%	0%

The results suggest that pts with preoperative PET viability study had decreased peri- and postoperative complications compared to those without. Therefore, preoperative PET viability study may provide unique information, which may lead to more appropriate selection of patients for CABG.

788-6 Comparison of Thallium-201 Rest-Redistribution SPECT and FDG SPECT in Predicting Functional Recovery After Revascularization

Jeroen J. Bax, Jan H. Cornelis, Frans C. Visser, Paolo M. Fioretti, Arthur van Lingen, Cees A. Visser. Free University Amsterdam, Netherlands; Academic Hospital Rotterdam, Netherlands

The aim of the study was to compare in the same patients (n = 24), FDG SPECT and Tl-201 rest-redistribution (RR) to predict functional recovery after revascularization. Regional myocardial function was evaluated before and 3 months after revascularization with echocardiography, using a 13-segment model and a 4-grade scoring system. The patients underwent Tl-201 RR

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