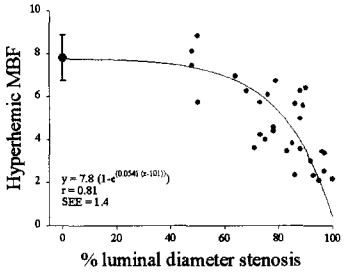
>90% graded CS, respectively with p<0.01 by ANOVA). By contrast, hyperhemic MBV only decreased with the highest graded CS (10.3 ± 1.3, 10.5 ± 1.9, 10.3 ± 1.6 and 8.9 ± 1.3% in <50%, 50-70%, 70-90%, and in >90% CS, respectively with p<0.05 ANOVA). As shown in the figure, calculated hyperhemic MBF correlated inversely with the severity of the underlying CS as previously described in animal experiments. Our study thus demonstrates that the physiological significance of human CS can be quantitatively evaluated by power modulation RT-MCE.



2:15 p.m.

864-2 Reversible Perfusion Defects During Dipyridamole Myocardial Contrast Echocardiography for the Detection of Coronary Artery Disease: A Multicenter Study

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Background: We hypothesized that stress myocardial contrast echocardiography (MCE) technique can detect coronary artery disease (CAD) in the absence of prior infarction on the basis of reversible perfusion defects.

Methods: 55 patients with suspected CAD and no previous myocardial infarction or wall motion abnormality were recruited from 3 centers in Europe. They underwent high mechanical index intermittent B-mode MCE during a continuous infusion of Sonazoid (Nycomed-Amersham) and coronary arteriography (CA) within 1 month of each other. Visual analysis of MCE data and quantitative CA were performed by blinded observers at 2 different centers in the United States.

Results: Forty-two (76%) had ≥ 50% stenosis of one or more coronary arteries. MCE detected reversible perfusion defect in one or more segment in 83% of these patients. The rate of CAD detection increased with higher degrees of stenosis: 88% in >75% stenosis and 100% in more than 90% stenosis. The specificity for a cut-off <50% stenosis was 44% in this patient population with chest pain. The accuracy of dipyridamole MCE for the detection of ≥ 50% stenosis was 76%.

Conclusion: MCE (using intermittent high mechanical index B-mode imaging) performed very well against quantitative coronary angiography for the detection of CAD in patients without previous infarction or wall motion abnormality. The relatively lower specificity was probably related to selection bias in patients undergoing coronary angiography for chest pain evaluation.

2:30 p.m.

864-3 Collateral Flow Can Prevent Myocardial Necrosis Despite Persistent Coronary Occlusion: Insights Using Myocardial Contrast Echocardiography in Patients

Wolfgang Lepper, Eduardo Balcells, Jonathan R. Lindner, Sanjiv Kaul, Todd Belcik, Eric Powers, Kevin Wei, *University of Virginia, Charlottesville, Virginia.*

Background: Primary determinants of infarct size include the duration of coronary occlusion, the size of the risk area, and also the adequacy of collateral perfusion. Myocardial blood flow (MBF) can now be quantified non-invasively with myocardial contrast echocardiography (MCE). We hypothesized that the presence of adequate collateral MBF within the risk area can be determined with MCE, and would prevent significant no reflow injury despite a persistently occluded infarct-related artery (IRA).

Methods: Patients presenting with a first acute ST-elevation myocardial infarction at least 2 hours from symptom onset, and were found to have an occluded IRA were enrolled. The risk area was defined as the akinetic area on 2D echocardiography. MCE was performed using continuous infusion of Optison (Mallinckrodt) and intermittent ultraharmonic imaging (Agilent) prior to primary angioplasty (PCI). Collateral MBF velocity was quantified using the rate of rise of video intensity (VI) from pulsing interval versus VI curves. Infarct size was determined with MCE >48 hrs after PCI, and was defined as the area of no reflow (persistent hypoperfusion at a PI of >8 cardiac cycles) and expressed as a ratio of the risk area.

Results: We enrolled 11 patients (7 male) who presented at a mean of 5.1+/-1.4 h from symptom onset. Median age was 58 yrs (range 36 - 83). The occluded IRA was identified as the left anterior descending in 4, right coronary in 6 and circumflex in 1. In 7 patients with no stenoses apart from the IRA, MBF velocity in normal myocardium was 0.73+/-10.25 s^{-1}. Collateral MBF velocity within the risk area ranged from 0 - 1.2 s^{-1} (mean 0.49+/-0.47 s-1). A significant inverse correlation was found between collateral MBF velocity and the extent of no reflow (r=-0.79,p=0.001). Patients with no reflow areas <50% of the risk area had significantly greater collateral MBF velocity than those with significant no reflow (0.93+/10.27 versus 0.12+/-0.14, p<0.001).

Conclusion: Adequate collateral MBF velocity can prevent myocardial necrosis despite persistent occlusion of the IRA in patients. Quantification of collateral MBF velocity with MCE may be a useful non-invasive test in patients presenting with acute MI.

2:45 p.m.

864-4 Incremental Value of Intravenous Myocardial Contrast Echocardiography in the Prediction of Contractile Recovery and Left Ventricular Remodeling Early After Acute Myocardial Infarction

Giovanna Mengozzi, Roberta Rossini, Caterina Palagi, Giuseppe Musumeci, Luigia Garritano, Maria Molfese, Anna S. Petronio, Duccio Volterrani, Vitantonio Di Bello, Mario Mariani, *CardioThoracic Dpt University of Pisa, Pisa, Italy, Oncology Dpt University of Pisa, Pisa, Italy.*

Background: Aim of this study was to assess the role of intravenous myocardial contrast echocardiography (IVMCE) in the prediction of contractile recovery and left ventricular (LV) remodeling in patients (pts) with acute myocardial infarction (AMI), successfully treated with PTCA.

Methods: Thirty-nine pts with AMI, successfully treated with PTCA, underwent IVMCE and low-dose dobutamine echocardiography (LDDE) on day 6 and 99mTc-Tetrofosmin SPECT at four weeks. IVMCE was graded semiquantitatively on a score of 0 (absent), 0.5 (partial) and 1 (normal). Pts were considered to have microvascular impairment, if 0.22 and an increase of LV end diastolic volume (EDV) >20%, respectively.

Results: At six-month follow-up, 16 (41%) out of the 39 patients showed contractile recovery (Group I), while the remaining 23 (59%) pts did not (Group II). In the prediction of contractile recovery, IVMCE showed a very high sensitivity (94,7%) but a low specificity (43,5%); LDDE had a sensitivity of 94%, with a specificity of 70%; SPECT showed a sensitivity of 94% and a specificity of 39% (P=0.02). By stepwise multiple regression analysis, the reduction of WMSI during dobutamine was the only significant independent predictor of contractile recovery (P=0.02).

At six-month follow-up, 10 patients showed LV remodeling (group A), while 29 did not (group B). In the prediction of LV remodeling, IVMCE had a very high sensitivity (100%) and specificity (96%). LDDE showed a high sensitivity (80%) and a lower specificity (69%), while SPECT showed a sensitivity of 70% and a specificity of 86% (P=0.007).

At stepwise multiple regression analysis, microvascular integrity at IVMCE was the only significant independent predictor of LV remodeling (P<0.0001; O.R. 0.34). In the prediction of LV remodeling, IVMCE increased the chi-square from 40.1 (obtained using clinical, basal echocardiographic, LDDE and SPECT data) to 88.2, while in the prediction of contractile recovery, no increase in chi-square was obtained.

Conclusions: IVMCE seems to be an important diagnostic tool, able to predict contractile recovery and LV remodeling after AMI. In the prediction of LV remodeling, it can add incremental value to LDDE and SPECT.

3:00 p.m.

864-5 Microcirculation Recovery After Primary Coronary Angioplasty in Patients With Acute Myocardial Infarction Treated With Abciximab or Intracoronary Adenosina

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Background: Despite the recanalization of the infarct related artery (IRA), microvascular integrity of downstream myocardium affects the recovery of left ventricular (LV) function and patient outcome. We investigated the effects of Abciximab and Adenosina on microvascular integrity and LV functional recovery in patients (pts) with acute myocardial infarction (AMI) treated with primary coronary angioplasty (PTCA).

Methods: Forty-seven pts (38 male; 57.1 ± 8 yrs), with first AMI (<6 hrs after onset), were treated successfully with primary PTCA. Before the procedure pts were randomized to abciximab (0.25 mcg/kg bolus plus 12-h infusion; Group A, n = 17), intracoronary adenosina (4 mg in 2 mL saline; Group B, n = 15) and conventional therapy (Group C, n = 15). Baseline clinical and angiographic characteristics were similar. Myocardial Contrast Echocardiography (MCE), using intracoronary injection of sonicated contrast medium, was performed immediately after successful PTCA; at 48 hrs and at 1 month MCE was performed using intravenous injection of echocontrast medium. Myocardial perfusion with MCE was scored as 0 (absent), 0.5 (partial) or 1 (normal). For each patient a perfusion score index (PSI) was calculated by averaging the contrast scores of the segments within the area at risk. Wall motion score index (WMSI) was assessed by 2D-echocardiography on admission and 3 months later.

Results: Immediately after IRA recanalization PSI was higher in abciximab and adenosina treated pts than in those of Group C (Group A 0.83±0.13 vs. Group C 0.72±0.16; p <0.05. Group B 0.89±0.16 vs Group C; p<0.005); this result was confirmed at 48 hours (Group A 0.88±0.14 vs. Group C 0.75±0.17; p <0.05. Group B 0.9±0.15 vs Group C; p<0.05). At one month intravenous MCE, only abciximab pts still showed a higher PSI than Group C pts (0.88±0.18 vs. 0.63±0.3; p <0.005). At three months 2D-echo the mean improvement of WMSI from baseline to 90 days was significantly higher in Group A pts (0.42±0.2 vs 0.14±0.1 vs 0.23±0.1; p<0.01).

Conclusion: In pts with AMI treated by successful primary PTCA abciximab and adenosina may improves microvascular perfusion of the infarct related territory. Moreover abciximab improves LV functional recovery.