1072-30 Heterogenous Reperfusion, Assessed by Myocardial Contrast Echocardiography During Myocardial Infarction, is Associated With a Substantial Delayed Recovery of Wall Motion

D. Czitrom, D. Karila-Cohen, E. Brochet, P. Seknadji, A. Boccara, P. Assayag, P.G. Steg. *Service de Cardiologie, Hopital Bichat, Paris, France*

During acute myocardial infarction (AMI), among patients with TIMI 3 patency, no-reflow (NR), defined by absence of perfusion on myocardial contrast echocardiography (MCE), is associated with impaired left ventricular function recovery. To explore the relation between acute myocardial perfusion and wall motion recovery, we performed MCE immediately after successful restoration of TIMI 3 patency by PTCA (n = 16) or i.v. thrombolysis (n = 3) in 19 patients with AMI < 6 hours (age: 49 ± 3 years, 68% anterior, time to TIMI 3 patency: 226 ± 15 min), via intracoronary injections of sonicated ioxaglate. Myocardial echographic perfusion was graded according to a semi-quantitative score (0, 0.5, 1) in all hypo or akinetic ASE segments. Echocardiography was repeated 9 ± 1 days in all patients and 6 weeks later in 13 patients. Echographic wall motion score (WMS) was graded from 1 (normokinesia) to 3 (akinesia).

MCE grade	0	0.5	1	p
Akinetic segments (day 9)	94%	83%[a]	41%	0.001
Average WMS (day 9)	2.9 ± 0.04	2.7 ± 0.1	2.1 ± 0.1	0.01
Akinetic segments (6 weeks)	87%	59%*	50%	0.04
Average WMS (6 weeks)	2.9 ± 0.1	2.5 ± 0.1*	2.2 ± 0.1	0.02

*p < 0.05 vs corresponding value at day 9. [a]p < 0.05 vs perfusion grade 1 segments

This suggests that in patients with TIMI grade 3 patency during AMI, a complete NR is highly predictive of an absence of wall motion recovery. However, segments with incomplete myocardial perfusion, although associated with a poor early wall motion recovery, underwent substantial late recovery, indicating a more profound, but still reversible, myocardial stunning.

1072-45 Both Repetetive Stunning and Hibernation are Present in Chronic Ischemic Left Ventricular Dysfunction: Serial Flow-Function Studies in a Chronic Canine Model

S. Firoozan, K. Wei, A. Linka, G. Ates, N. Goodman, S. Kaul. *University of Virginia, Charlottesville, VA, USA*

There is debate whether LV dysfunction seen in chronic coronary artery disease (CAD) is due to repetetive stunning or hibernation. To address this question, we have developed a canine model of chronic CAD where ameriod constrictors are placed on the proximal left anterior descending (LAD) and left circumflex (LCx) arteries. Indwelling catheters are placed in the AO and LA and these are externalized. The dogs then undergo radiolabeled microsphere myocardial blood flow (MBF) assessment and regional LV wall thickening analysis by 2D echo serially over 3 to 6 weeks. The dogs are killed when severe global LV dysfunction and dilatation is manifest. We studied 6 dogs in this manner. MBF and regional wall thickening (using the entire systolic contraction sequence) was measured separately in the LAD and LCx beds. Severe stenosis was noted on postmortem angiography and necrosis was absent on tissue analysis. Of the 12 beds studied, MBF was significantly reduced in 5 (hibernating) and was not reduced in 7 (stunned) despite severe dysfunction in all 12 beds by the time of sacrifice. MBF ($mL \cdot min \cdot g^{-1}$) in the hibernating beds declined from 1.6 ± 0.4 at baseline to 0.6 ± 0.2 at sacrifice (p = < 0.01), while thickening decreased from 31 ± 5% to 10 ± 4% (p < 0.01). In the stunned beds, MBF ($mL \cdot min \cdot g^{-1}$) was 1.4 ± 0.6 at baseline and 1.1 ± 0.2 at sacrifice (p = 0.3), while thickening decreased from 33 ± 11% to 14 ± 6% (p < 0.01). It is concluded that both repetetive stunning and hibernation are present in chronic ischemic LV dysfunction. Our model could be used to provide further pathophysiologic insights into this important condition.

1072-46 Intracoronary Echocontrast Evaluation of Myocardial Viability After PTCA: A Comparison with Echo Dobutamine low Dose Stress Test

A.S. Petronio, R. Baglini, U. Limbruno, G. Mengozzi, M.G. Delle Donne, M. Vaghetti, A. Cantarelli, G. Amoroso, M. Mariani. *Institute of Cardiology, University of Pisa, Italy*

In 10 pts with previous myocardial infarction (9 males, 1 female, mean age 60 y), submitted to PTCA on the infarct related vessel, intracoronary echocontrast (IE) was compared with low dose echodobutamine stress test (ED) results. IE and ED were performed before PTCA. An echo 90 days follow up was obtained in all pts. Myocardial perfusion was assessed by IE with a semiquantitative score ranging from 0 (no perfusion) to 3 (homogeneous perfusion). ED was carried out by a digitalized approach. *Results:* 41 out of 160 (25%) LV segments showed abnormal motion before ED and IE. ED evidence of viable myocardium was obtained in 24 out of 41; a normal perfusion pattern) (2 or 3 IE pattern) was observed in 20 (83%). Among the 17 non-viable ED segments, 12 showed reduced or absent perfusion (0 or 1 IE pattern) (82%) while 5 segments showed normal perfusion. IE allowed to show 25 segments with normal flow and 16 segments with reduced or absent flow. After 90 days follow up an improvement in wall motion was observed in 75 and 29% of viable and non viable ED segments respectively (specificity 68%, sensitivity 73%). On the other hand, 87% IE normally perfused segments have shown an improvement of their motion and 85% of hypo or non perfused segments confirmed the absence of viability (specificity 72%, sensitivity 90%). Segments showing ED evidence of viable myocardium and IE 2 or 3 score improved their motion after PTCA in 82% of cases. In conclusion, IE shows a better sensitivity than ED in the evaluation of myocardial viability. The simultaneous evaluation of IE and ED data does not improve these results.

1072-47 The *Resting* Myocardial Contrast Defect Seen With Extended Time Intervals Between Frame Rates Following Intravenous Microbubbles Correlates Best With Infarct Size

T. Porter, S. Li, D. Kricsfeld, K. Kilzer. *University of Nebraska Medical Center, Omaha, Nebraska, USA*

The myocardial ultrasound contrast defect observed with conventional (conv) 30 Hz frame rates (FR) following reperfusion (REP) of an occluded vessel correlates with infarct size (IS) *only* when the intravenous (IV) microbubbles (MB) are given during hyperemia. Since conv FR destroy large numbers of MB, we hypothized that newer imaging techniques which reduce MB destruction like triggered imaging (TI) will be more sensitive in identifying infarct zones following REP. To test this hypothesis, we gave IV perfluorocarbon-exposed sonicated dextrose albumin (PESDA) MB (0.0025–0.01 ml/kg) to 11 open chest dogs who had a sustained coronary occlusion (range 1.9–2.5 hours) followed by REP. After 15 minutes of reflow, contrast defects (CD) observed with TI (one frame every 1 to 20 cardiac cycles) following IV PESDA were measured under resting conditions and during low dose dobutamine (LDD). IS was determined post mortem with triphenyl tetrazolium chloride (TTC); risk area (RA) with Monastral Blue.

Results: IS ranged from 23 to 77% of the total RA, and correlated the closest with *resting* contrast defects (CD) using TI, especially defects determined with extended time intervals between FR (r = 0.98, standard error 0.4 cm^2). CD size during LDD correlated less closely with IS (r = 0.77). An example:

We conclude that the *resting* myocardial CD determined with TI following REP can accurately identify zones of no reflow and infarction.

1072-48 The Safety and Efficacy of Intravenous Perfluorocarbon Exposed Sonicated Dextrose Albumin in 110 Patients When Using Conventional or Transient Response Imaging

T. Porter, S. Li, D. Kricsfeld. *University of Nebraska Medical Center, Omaha, Nebraska, USA*

The safety of intravenous (IV) perfluorocarbon-containing microbubbles and newer ultrasound imaging techniques which attenuate microbubble destruction (transient response imaging) in humans has not been evaluated. It is also unknown whether harmonic transient response imaging can repeatedly produce myocardial contrast (MC) in a large group of patients (pts). Accordingly, we assessed the ability of IV perfluorocarbon-exposed sonicated dextrose albumin (PESDA) to consistently produce MC in 110 pts (age 36–80 yrs, weight 47–108 kilograms). MC was determined both visually (0 = no contrast, 1+ = mild, and 2+ = bright MC), and quantitatively using a 1–255 gray scale off line. Safety was assessed by measuring changes (Δ) in oxygen saturation (O2 sat), mean arterial pressure (MAP), respiratory rate (rr), and EKG before and after injection. Four different imaging techniques (IT) were compared: 30 Hertz and triggered (transient response) 1st harmonic (30-1st and TRI-1st) as well as 30 Hertz and triggered 2nd harmonic (30-2nd and TRI-2nd) using a 1.7–2.5 Megahertz fundamental frequency. (;* p < 0.05 compared to other groups; N = number of pts that underwent the IT):