mostly associated with impairment of myocardial perfusion even after successful intervention. Indicating distal protective devices may benefit for myocardial perfusion during PCI in these lesions.

1120-42 Improved Myocardial Blush Grade Is Associated With Reduced Troponin I Elevation in Unstable Angina Patients Undergoing Percutaneous Intervention

Ananth M. Prasan, Christopher Flood, Cheryl Friend, Mark R. Pitney, Roger M. Allan, Warren Walsh, Robert W. Giles, Nigel S. Jepson, Eastern Heart Clinic, Prince of Wales Hospital, Sydney, Australia

Background: Improved myocardial blush grade (MBG) is associated with better MACE outcomes in MI patients. However, the utility of MBG assessment in unstable angina (UAP) patients undergoing percutaneous intervention (PCI) is unknown. We sought to determine MBG, post procedural troponin I (TnI) elevation and long term outcome in a cohort of UAP patients. **Methods**: 372 consecutive UAP patients (mean age 68±1 years) treated with PCI were included. No patients had a pre procedural TnI elevation. Final MBG was recorded for the territory subserving the PCI treated culprit lesion in each patient and graded 0 (no blush), 1 (minimal blush), 2 (moderate blush) and 3 (normal blush). TnI (normal range <0.1 ug/L) was measured 24 hours post procedure. Patients who did not have a TnI elevation (ie.<0.1 ug/L) were ascribed a value of 0.1 ug/L. Patients were followed up (mean 962±83 days) by postal questionnaire. **Results**: Baseline risk factors were comparable between MBG groups. There was a decrease in post procedural TnI in patients with an improved final myocardial blush grade (Table). Patients with poor MBG (0/1) underwent proportionately more target vessel revascularisation. There was no significant difference in mortality between MBG groups. **Conclusions**: Improved blush grade in UAP patients undergoing PCI is associated with lower TnI elevation. Identification of UAP patients with poor final MBG may allow a window of opportunity for the administration of adjuvant therapies to improve microvascular perfusion in the future.

	MBG 0	MBG 1	MBG 2	MBG 3	p value
n	69	58	112	133	
Death	5	2	3	4	NS
Troponin I (ug/L)	0.34±0.12	0.68±0.26	0.14±0.01	0.11±0.01	<0.001
TVR	11	19	18	18	<0.05

1120-43 Distal Protection Device Was Associated With Better Left Ventricular Function by Improving Microcirculation After Primary Coronary Intervention

Il Rhee, Sang Hoon Lee, Kyung Pyo Hong, Jung Euy Park, Sung Don Seo Seo, Hyeon-Cheol Gwon, Sungkyunkwan University School of Medicine, Samsung Medical Center, Seoul, South Korea

BACKGROUND: The primary angioplasty has been reported to be successful in more than 90% of patients with acute myocardial infarction. The distal embolization of thrombus/plaque components, however, remains a challenge for the interventional cardiologists. The distal protection device is expected to improve the clinical outcome by reducing the distal embolization. The goal of this study was to evaluate whether PercuSurge®, the distal protection device, improves 30-day clinical outcomes after primary angioplasty.
METHODS: From April 2002 to July 2003, 29 patients with acute myocardial infarction within 12 hours after symptom onset were included to undergo primary angioplasty using PercuSurge® (PS group). Among the patients who underwent primary angioplasty without PercuSurge® during previous one year, 30 patients were selected by matching the following criteria (C group): (1) infarct-related artery; (2) pre-angioplasty TIMI flow grade; (3) sex; (4) age; and (5) pain-to-balloon time. We reviewed and analyzed the medical records and coronary angiograms.
RESULTS: There were no significant differences in the baseline characteristics including baseline left ventricular ejection fraction and the incidence of TIMI 3 flow before and after angioplasty between two groups. The procedures were successful without complications in all patients of both groups. PS group, however, was associated with higher occurrence of grade 3 myocardial blush (PS 62% versus C 30%; p=0.04) and early ST-segment elevation resolution (PS 76% versus C 47%; p=0.02) compared to C group. PS group also showed greater left ventricular ejection fraction (PS 52%±9 versus C 45%±10; p=0.01). There was no significant difference in the incidence of death or myocardial infarction between two groups.
CONCLUSIONS: PercuSurge® was safe and feasible during primary angioplasty. PercuSurge® was also associated with a better recovery of myocardial function as well as better microcirculatory function at 30 days after primary angioplasty.

1120-44 Objective Evaluation of Tissue Level Perfusion Using Parametric Analysis of Myocardial Blush Kinetics

Helmut Kuecherer, Urban Malsch, Thomas Hilbel, Hartmut Dickhaus, University of Heidelberg, Heidelberg, Germany

Background: Visual estimation of myocardial blush is used to judge adequacy of tissue level perfusion following revascularization in acute myocardial infarction. The two common approaches either analyze temporal kinetics (TIMI myocardial perfusion grade, TMPG) or peak levels of regional contrast intensities (myocardial blush grade). Aim: We developed and tested a computer assisted procedure to visualize and objectively quantitate both temporal and spatial spread of myocardial blush in 8 normals (mean age 61 years) and in 34 patients (mean age 65 years) before and after percutaneous interventions for acute coronary syndrome.
Methods: Sequences of ECG-gated angiograms were obtained during breath hold, logarithmically transformed and automatically corrected for residual motion. The time course of blush intensity was followed on a pixel-by-pixel basis. We defined 4 different parameters for each intensity profile that were displayed as color coded maps: maximal intensity (Gmax), time to maximal intensity (Tmax), maximal upslope (Imax) and maximal downslope (Dmax). Spatial distribution of blush was derived from parametric images. Results: Parameters were useful to define normal and to detect abnormal TMPG (see table). Successful reperfusion at the tissue level was characterized by shorter Tmax (8.6±3.4 vs. 5.6±1.1 cycles from dye injection), faster wash-in (Imax, 6.0±3.0 vs. 17.2±8.2 grey levels/cycle) and faster wash-out (3.8±0.8 vs. 12.6±6.3 grey levels/cycle).
Conclusion: Parametric imaging can be used to objectively analyze tissue level perfusion following percutaneous intervention. This approach may be used to gauge reperfusion strategies in acute coronary syndromes.

1120-45 Epicardial Stenosis Severity Does Not Affect Minimal Microcirculatory Resistance

Wilbert Aarnoudse, Bernard De Bruyne, William Fearon, Philip MacCarthy, Frans van de Vosse, Jacques Koolen, Maartje Geven, Nico Pijls, Catharina Hospital, Eindhoven, The Netherlands

Background: Recently, we introduced an invasive index of microcirculatory resistance (IMR) calculated by the product of distal coronary pressure (P*d*) and thermodilution-derived mean transit time (T*mn*) measured at hyperemia: IMR = P*d* . T*mn* . In the absence of an epicardial stenosis, myocardial flow is equal to coronary flow, and IMR correlates well with true myocardial resistance. In the presence of a stenosis however, myocardial flow is not only determined by coronary flow but also by collateral flow and IMR (and comparable indices of microvascular resistance) should actually be corrected for coronary wedge pressure (P*w*):
IMR = P*a* . T*mn* ((P*d*-P*w*)/(P*a*-P*w*)).
The aims of this study were to investigate the feasibility of determining IMR in humans and to test the hypothesis that microcirculatory resistance is independent of the presence of a stenosis.
Methods: 17 patients scheduled for PCI of a single stenosis were studied. Using a regular 0.014" pressure/temperature guidewire, the lesion was stented and during balloon occlusion, coronary wedge pressure was measured. After stenting, a balloon with a diameter of 1.0 mm smaller than the deployed stent was introduced into the stented segment and inflated with increasing pressures, creating 3 stenoses with increasing severity of 10%, 50% and 75% respectively. At each degree of stenosis, fractional flow reserve (FFR) and IMR were measured, using iv adenosine for steady state hyperemia.
Results: 51 measurements of IMR were done in 17 patients. When IMR was not corrected for P*w* , an apparent increase in microcirculatory resistance was observed with increasing stenosis severity (IMR= 24, 29, and 36 U for the 3 different degrees of stenosis, p=0.02). In contrast, after correcting IMR for P*w* as indicated above, the index did not change with stenosis severity (IMR= 23, 24, and 25 U respectively, p=0.49).
Conclusions: (1) Assessing microvascular resistance by IMR is feasible in humans. (2) When corrected as appropriate for the contribution of collaterals, IMR does not change with stenosis severity. These data indicate that microvascular resistance is independent of epicardial stenosis severity and that IMR is a specific index for assessing microvascular function.

1120-46 Decreased Coronary Flow Reserve After Myocardial Infarction Is Associated With an Elevated Coronary Zero Flow Pressure

Paul L. Van Herck, Stephane G. Carlier, Peter Gorissen, Marc J. Claeys, Johan M. Bosmans, Christiaan J. Vrints, University Hospital Antwerp, Edegem, Belgium, Lenox Hill Hospital, New York, NY

Background: Coronary flow velocity reserve (CFVR) is diminished after myocardial infarction (MI). A higher zero flow pressure (Pzf) in the coronary microcirculation may be a possible explanation. Pzf reflects the back pressure for myocardial perfusion and could be increased by microcirculatory disorders such as intercellular edema and capillary plugging after myocardial infarction. We tested the hypothesis that patients after myocardial infarction have a higher Pzf.
Methods: We measured simultaneously distal intracoronary flow (Flowire) and pressure (Wavewire) after stenting in 15 patients with stable angina pectoris (AP) and 23 patients in the subacute phase of MI (Q wave MI: n=14 (QMI) and Non Q wave MI: n=9 (non-QMI)). The Pzf was determined by extrapolating the diastolic hyperemic intracoronary pressure-flow relation after stenting to the pressure axis.
Results: ANOVA showed a statistical significant difference for CFVR, hAPV (hyperemic average peak velocity) and Pzf (see table). CFVR and hAPV were significantly lower in QMI vs AP. The Pzf was significantly higher in QMI vs AP, but not vs NonQMI.
Conclusion: The present data suggest that the decrease of CFVR after myocardial infarction is associated with an increased back pressure in the coronary microcirculation.

	AP	NonQMI	QMI	ANOVA
CFVR	2.27±0.70	2.27±0.56	1.72±0.39*	p=0.0036
hAPV (m/s)	0.564±0.205	0.524±0.175	0.411±0.146*	p=0.0221
Pzf (mmHg)	14.6±8.2	24.6±12.9	34.4±15.3**	p=0.0005

Mean ± SD; * p<0.01 Bonferroni correction for QMI vs AP; ** p<0.0001 Bonferroni correction for QMI vs AP