

2005 ANGIOPLASTY SUMMIT TRANSCATHETER CARDIOVASCULAR THERAPEUTICS ASIA PACIFIC

Poster Abstract Presentations

All Poster Abstracts will be available for viewing in the Exhibit Hall, Level B1 at the following times:

Friday, April 29, 2005

9:00 AM–11:00 AM

2:00 PM–4:00 PM

Saturday, April 30, 2005

9:00 AM–11:00 AM

Moderated Poster Abstract Presentations

These presentations, moderated by world-celebrated experts, will honor some of the best abstracts during each poster abstract presentation session in the Exhibit Hall, Level B1 at the following times:

Friday, April 29, 2005, 9:00 AM–11:00 AM
(Abstract nos. 7–9, 43)

Friday, April 29, 2005, 2:00 PM–4:00 PM
(Abstract nos. 72–75, 124)

Saturday, April 30, 2005, 9:00 AM–11:00 AM
(Abstract nos. 140, 175, 184, 188, 198)

Acute Myocardial Infarction

Friday, April 29, 2005

9:00 AM–11:00 AM

Exhibit Hall, Level B1

(Abstract nos. 7–30)

AS-7

Influence of Patency of the Infarct-Related Artery Before Coronary Intervention on Myocardial Salvage in Patients with Acute Myocardial Infarction. W. Cui¹, M. Sarai², T. Kondo², T. Sato², K. Oshima², H. Naruse², J. Ishii², Y. Mori², H. Hishida². ¹The Second Hospital of Hebei Medical University, Shijiazhuang, China; ²Division of Cardiology, Department of Internal Medicine, Fujita Health University, Toyoake, Japan.

Background: We studied the influence of patency of the infarct-related artery (IRA) before emergency percutaneous coronary intervention (PCI) on the amount of salvaged myocardium from the procedure in patients with acute myocardial infarction (AMI) to provide evidence for facilitated PCI.

Methods: A total of 45 patients with AMI who underwent emergency PCI within 12 hours of symptom onset were enrolled in this study. Iodine-123-BMIPP and technetium-99m tetrofosmin dual isotope scintigraphy performed in the subacute phase were retrospectively analyzed. Patients were divided into occluded and nonoccluded groups according to the status of IRA patency before emergency PCI. The amount of salvaged myocardium was calculated by the difference between defect size derived from simultaneous iodine-123-BMIPP and technetium-99m tetrofosmin scintigraphy.

Results: We studied 37 men and 8 women, with mean age of 62.62 ± 9.59 years. IRA was the right coronary artery in 18 patients, left anterior descending coronary artery in 22, and left circumflex artery in 5. There were 27 patients in the group with patent IRA and 18 in the group with occluded IRA. The mean interval between symptom onset and scintigraphic examination was 17.31 ± 8.24 days. There was no significant difference between the 2 groups in age, interval between symptom onset, scintigraphic examination, and sex distribution. Risk areas assessed by BMIPP scintigraphy were similar between the 2 groups, with $35.05 \pm 16.94\%$ in the patent IRA group versus $35.99 \pm 16.67\%$ in the occluded group ($p = 0.857$). The final infarct size as determined by technetium-99m tetrofosmin was smaller in patients with patent IRA ($25.03 \pm 19.81\%$) than that in patients with occluded IRA ($34.07 \pm 17.09\%$, $p = 0.047$). However, the amount of salvaged myocardium was significantly greater in patients with patent IRA ($10.03 \pm 12.15\%$) compared with patients with occluded IRA ($1.91 \pm 8.17\%$, $p = 0.006$).

Conclusion: Patients with AMI with a patent IRA before emergency PCI can benefit more from the procedure than patients with occluded IRA. This result supports the recently proposed concept of facilitated PCI, which means that even in the era of mechanical reperfusion, open IRA as early as possible can salvage more myocardium.

AS-8

Effectiveness of Thrombectomy and Distal Protection for Non-ST-Segment Elevation Myocardial Infarction. Y. Furuse, T. Muramatsu, R. Tsukahara, Y. Ito, K. Hirano, S. Nishimura, T. Tsubota. Division of Cardiology, Kawasaki Social Insurance Hospital, Kawasaki, Japan.

Background: The effectiveness of thrombectomy and distal protection for non-ST-segment elevation myocardial infarction (NSTEMI) still remains to be elucidated.

Methods: We enrolled consecutive 254 myocardial infarction (MI) patients from January 2002 to December 2003. Patients were classified into 2 groups: STEMI (group S) and NSTEMI (group N). Findings from coronary angiography, percutaneous coronary intervention procedures, target lesion revascularization (TLR), left ventricular ejection fraction (LVEF) at 6-month follow-up, major adverse cardiac events (cardiac death, acute MI, coronary artery bypass grafting, TLR), and

effectiveness of thrombectomy (including distal protection) were compared between the 2 groups.

Results: NSTEMI was seen in 21% (54 of 254 cases) of all MI. No differences existed in patient characteristics between groups. Chronic total occlusion complicated cases (29% vs 6%) and spontaneous recanalization cases (48% vs 22%) were more common significantly ($p < 0.05$) in group N versus group S, respectively. Thrombolysis in Myocardial Infarction (TIMI) grade 3 flow acquisition rate was lower in group N (86% vs 98%). However, in cases in which thrombectomy (including distal protection) was performed, it was high (100%) in both groups. TLR (20% vs 27%), LVEF at 6-month follow-up (57.7% vs 59.3%, $p < 0.05$), and incidence of major adverse cardiac events (27% vs 31%) were similar in groups N and S, respectively.

Conclusion: As thrombectomy (including distal protection) increased the TIMI grade 3 flow acquisition rate in both types of MI, thrombectomy and distal protection seems to be beneficial, not only in STEMI, but also in NSTEMI patients.

AS-9

Long-Term Results of Drug-Eluting Stents Compared with Bare-Metal Stents in Patients with Acute Myocardial Infarction. Y-S. Lee, S-H. Lee, C-W. Nam, S-W. Han, S-H. Hur, Y-N. Kim, K-S. Kim, K-B. Kim. Division of Cardiology, Dongsan Medical Center, Keimyung University, Daegu, Korea.

Background: Sirolimus-eluting stents (SES) have recently been shown to reduce restenosis and reintervention compared with bare-metal stents (BMS). Effectiveness of SES in acute myocardial infarction (AMI) remains unknown. The aim of this study was to evaluate the efficacy of an SES implantation in patients with AMI compared with BMS.

Methods: From January 2003 to April 2004, angioplasty was performed with drug-eluting stents in 76 patients (82 lesions) with AMI who were compared with 107 patients (114 lesions) treated with BMS. The incidence of major adverse cardiac events (MACE), which included angina, heart failure, death, nonfatal MI, target lesion revascularization (TLR), and binary angiographic restenosis, were evaluated.

Results: Results were as follows (Table).

Baseline characteristics	BMS	DES	p Value
	N = 107	N = 76	
Age (yr)/Male (%)	60 ± 10/77 (72.0%)	60 ± 11/58 (76.3%)	NS
Hypertension (%)	38 (35.5%)	32 (42.1%)	NS
In-hospital outcomes			
Stent thrombosis/Death (%)	0/0	1 (1.3%)/0	NS
Nonfatal MI (%)	9 (15.3%)	9 (13.2%)	NS
MACE @ 6 Mo	42 (39.3%)	6 (8.2%)	< 0.01
Death/Stroke	1 (0.9%)/0	0/0	NS
TLR	15 (22.1%)	3 (6.5%)	0.02
Lesion characteristics	N = 114	N = 82	
TIMI 0/1	40 (35.1%)	19 (24.4%)	NS
Pre-MLD	0.39 ± 0.33	0.39 ± 0.27	0.02
Acute gain	2.94 ± 0.48	2.55 ± 0.39	< 0.01
CAG FU @ 6 Mo	73 (64.0%)	51 (62.2%)	
Late loss	1.34 ± 0.96	0.38 ± 0.54	< 0.01
ISR	26 (35.6%)	3 (5.9%)	< 0.01

Conclusion: The SES implantation may be a safe and effective strategy for the treatment in patients with AMI in early and late clinical outcomes.

AS-10

Radial Access in Acute Myocardial Infarction: Single-Center Experience After 7 Years. J. Gaspar, B. Erramun, C. Pardinas, D. Fiandra, A. Fiandra, A. Firszt, J. Musetti, S. Lopez, F. Urrutia. Instituto Nacional de Cirugia Cardiaca, Montevideo, Uruguay.

Background: The use of coronary angioplasty in acute myocardial infarction (AMI) was well established by the literature. Radial access provides reduction of vascular complications, early deambulation, and reduction of hospital stay. We evaluated the benefits of radial access in this patient population.

Methods: Between June 1997 and September 2004, the National Institute of Cardiac Surgery in Montevideo, Uruguay used radial access ad hoc for cardiovascular interventional procedures. We searched our database for patients with AMI within <12 hours of symptom onset treated by coronary angioplasty. In the radial group, exclusion criteria were an ischemic Allen Test, right and left mammary artery graft, Raynaud disease, and arteriovenous fistula for dialysis in the same arm. A retrospective analysis was performed to evaluate this population.

Results: From a total of 819 patients, we found 625 (76.3%) treated by radial access. Baseline demographics showed that 65% were men, and the mean age was 62 ± 12 years. We used right radial access in 513 cases (82.08%) and left radial in the remaining 112 (17.92%); in this group, 21 procedures were performed because of an ischemic Allen test in the right hand, and the rest were for previous bypass surgery with the left mammary artery graft. Access time was 2.4 ± 2 minutes. Sheath size was 6Fr in 582 (93.1%) patients and 7Fr in 43 patients (6.9%). Procedure success was achieved in 96.7% of the patients. Crossover to femoral access was necessary in 18 patients (2.8%) because of spasm or insoluble anatomic difficulty. Glycoprotein IIb/IIIa inhibitors were needed in only 32 patients (5.12%). A total of 671 stents (1.15 stents per patient) were implanted in 579 patients, and 46 (7.36%) patients were treated with balloon angioplasty only. Fluoroscopy time measured in a series of 100 patients in 2003 was 11.4 ± 4.2 minutes. The sheath was removed after electrocardiography outside of the catheter laboratory in all patients. We achieved adequate hemostasis with pressure dressing for a minimum of 3 hours. There were no major vascular access complications in 99.83% of patients; 1 patient developed compartmental syndrome that required vascular surgery. No blood transfusions were needed. In addition, small hematomas occurred in 21 patients (3.36%), postprocedure stay was 1.8 ± 0.5 days, combination with intra-aortic balloon pump was 1.16%, incidence of in-hospital major adverse cardiac events was 6.2%, and loss of the radial artery pulse 30 days after procedure occurred in 19 cases (3.04%).

Conclusion: The extremely low number of vascular complications and the reduction of postprocedure hospital stay show that radial access is a safe procedure to use in the AMI population.

AS-11

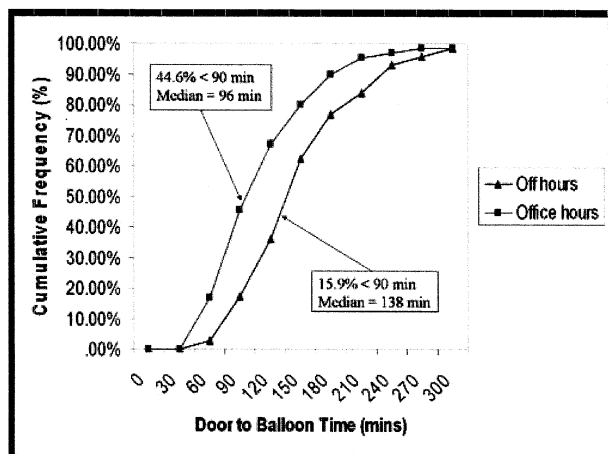
Clinical Outcomes of Modern Primary Angioplasty for Acute Myocardial Infarction During “Office” Hours Versus “Off” Hours. C.Y. Soon¹, W.X. Chan¹, Y.J. Wu², H.C. Tan¹. ¹National University Hospital Singapore; ²Clinical Trial Epidemiological Research Unit, Singapore.

Background: Delay in time to reperfusion during primary angioplasty (PA) is associated with poorer outcomes. We compared the outcomes of PA for acute ST-segment elevation myocardial infarction (STEMI) during “office” versus “off” hours.

Methods: In a prospective observational study of data collected between June 2001 and May 2003, 135 consecutive patients (64.9%) with STEMI underwent PA without antecedent fibrinolytic therapy during office hours (8:00 a.m. to 5:30 p.m. Monday to Friday, 8:00 a.m. to 12:30 p.m. Saturday). They were compared with 73 consecutive

patients (35.1%) who underwent PA during off hours (any other time). The primary endpoints of this study were mortality and major adverse cardiac events (MACE) at 1 and 6 months.

Results: (figure) Baseline demographics were similar for both groups. Mortality at 1 month (office, 8.3%; off, 8.3%; $p = 1.000$) and 6 months (9.4% vs 11.4%, $p = 0.647$) did not show any significant difference. MACE rates at 1 month (office, 9.1%; off, 8.5%; $p = 0.878$) and 6 months (14.1% vs 13.0%, $p = 0.843$) were also similar. The door-to-balloon time (median: 96 minutes for office hours, 138 minutes for off hours; $p < 0.001$) was significantly prolonged during off hours but not the symptom-to-balloon time (231 min vs 237 min, $p = 0.234$).



Conclusion: Primary angioplasty for acute myocardial infarction can be performed with equal safety and efficacy during off hours compared with during office hours, despite longer door-to-balloon time.

AS-12

Short-Term Clinical Outcomes of Primary Percutaneous Coronary Intervention in 214 Patients with Acute Myocardial Infarction. W. Wei, G.P. Li, Y.M. Xu, S.T. Chen, H.L. Cong, Y.X. Gao, T.G. Huang. Department of Cardiology, 2nd Hospital of TianJin Medical University, TianJin, China.

Background: The aim of this study was to evaluate the effectiveness and safety of primary percutaneous coronary intervention (PCI) for treatment of acute myocardial infarction (AMI).

Methods: Retrospective analysis of immediate and in-hospital outcomes was performed in 214 consecutive patients with AMI who underwent primary PCI from January 2000 to December 2003. Of the 214 patients with AMI, 169 were men, 45 were women; the average age was 61.5 ± 10.7 years (range, 33 to 86); 110 had anterior AMI, 104 had inferior AMI; and the average time from the onset of AMI to primary PCI was 5.78 ± 3.62 hours (range, 1.5 to 20).

Results: A successful procedure was achieved in 208 of 214 patients (97.2%) with AMI who underwent primary PCI, and 189 of the 208 successful procedure cases (90.8%) had Thrombolysis in Myocardial Infarction (TIMI) grade 3 blood flow. No-reflow phenomenon occurred in 19 of 208 cases (9.1%) and reperfusion arrhythmia in 101 of 208 cases (48.5%). Of the 6 unsuccessful procedure cases, 4 failed in the passage of the guiding wire through the lesions. In the 214 patients with AMI who underwent primary PCI, 5 patients died (2.3%); 2 of the 5 deaths occurred during the procedure (0.93%), 1 within 2 hours after PCI, 1 within 2 days after the procedure, and 1 death

occurred within 7 days from recurrent AMI because of subacute in-stent thrombosis confirmed by angiography. In patients who survived PCI, the average in-hospital time was 11.25 ± 6.26 days (range, 1 to 32). Among the successful procedure cases, the incidence of in-hospital major adverse cardiac events (MACE) was 7.2% (15 of 208), including death (1.4%, 3 of 208), AMI (2.4%, 5 of 208), and angina pectoris (3.4%, 7 of 208).

Conclusion: Primary PCI for the treatment of AMI had a high rate of procedural success and good short-term effect. With the high patency rate of the infarct-related arteries, primary PCI may shorten the length of in-hospital stay, improve survival, and decrease MACE in patients with AMI. Primary PCI may be used as first-line therapy for AMI in most patient populations.

AS-13

Predictive Factors of Major Adverse Cardiac Events in Acute Myocardial Infarct Patients Complicated by Cardiogenic Shock Who Underwent Primary Percutaneous Coronary Intervention.

S.Y. Lim, M.H. Jeong, E.H. Bae, W. Kim, J.H. Kim, Y.J. Hong, H.W. Park, D.G. Kang, Y.S. Lee, K.H. Kim, S.H. Lee, K.H. Yun, S.N. Hong, J.G. Cho, Y.K. Ahn, J.C. Park, B.H. Ahn, S.H. Kim, J.C. Kang. Chonnam National University Hospital, Gwang Ju, Korea.

Background: The aim of this study was to assess in-hospital mortality and major adverse cardiac events (MACE) during long-term clinical follow-up of patients with cardiogenic shock (CS) after acute myocardial infarction (AMI) who underwent primary percutaneous coronary intervention (PCI).

Methods: We analyzed data in 147 patients with CS after AMI (age, 61.7 ± 10.4 years; 108 men, 39 women), who underwent primary PCI at Chonnam National University Hospital between January 1999 and December 2002. Data included clinical characteristics, coronary angiography findings, mortality during admission, and major adverse cardiac event (MACE) during a 1-year clinical follow-up.

Results: Of the enrolled patients, 121 patients survived (94 men, 27 women) and 26 died (14 men, 12 women) during admission. By binary logistic regression analysis, in-hospital death was associated with low Thrombolysis in Myocardial Infarction (TIMI) flow after coronary revascularization ($p = 0.02$; odds ratio, 1.3). A total of 89 patients (60.5%) survived without MACE over the 1-year clinical follow-up. MACE was associated with a C-reactive protein level >1 mg/dL ($p = 0.002$; odds ratio, 6.3) and low TIMI flow after coronary revascularization ($p < 0.001$; odds ratio, 7.8).

Conclusion: Primary PCI achieving TIMI 3 flow reduces in-hospital death in AMI with CS. High levels of CRP and low TIMI flow are associated with MACE during long-term clinical follow-up.

AS-14

Complement Factors in Acute Myocardial Infarction and Unstable Angina. M. Namdari, S. Nadri, M.J. Tarrahi, A.E. Nadimi. Lorestan Medical University, Lorestan, Iran.

Background: Coronary artery disease (CAD) is the most common and lethal disease in the world. CAD represents a broad spectrum of disease from silent ischemia at one end to sudden cardiac death at the other end. The middle of this spectrum consists of acute myocardial infarction (AMI) and unstable angina pectoris (UA). Recent data show that the inflammatory process plays a major role in the pathogenesis of acute coronary syndrome. In this study, we evaluated the difference in complement factors C3 and C4 between AMI and UA, and the relation between early complications of AMI and UA and the amount of C3 and C4.

Methods: In this cross-sectional analytic study, 30 patients with AMI and 30 patients with UA were compared with healthy subjects.

Clinical and laboratory data were collected. Blood samples were obtained on arrival and at 12, 24, and 48 hours, and electrocardiography and echocardiography were performed. All patients were monitored for 14 days.

Results: Complement activation occurred in patients with AMI and UA. In AMI, activation of complement factors was significantly higher than in UA ($p < 0.01$). In Q-wave MI and congestive heart failure, this elevation of activity was prominent ($p < 0.01$). In AMI, a positive relation was found between complement factors and creatine phosphokinase level ($r = 0.71$). There was a positive relation between complement and mortality, and an inverse relation with ejection fraction ($r = 0.71$). There was significant difference among complement factors in the UA, AMI, and control group ($p < 0.01$).

Conclusion: Elevated levels of complement factors in AMI were related to the degree of left ventricular ejection fraction (LVEF), Q-wave MI, and mortality. However, in UA, elevated levels of complement factors were unrelated, with the exception of the serum C3 level, which was related to LVEF.

■ AS-15

Practice Variation for Guidelines Application in Patients with Acute ST-Segment Elevation Myocardial Infarction Who Arrived at Hospitals Within 12 Hours of Onset of Chest Pain. Y. Chen,

X. Song, S. Lv, H. Zhu, W. Pan, S. Ning, T. Kang. Capital Medical University Affiliated Beijing Anzhen Hospital, Beijing, China.

Background: The aim of this study was to evaluate current therapies in patients with acute ST-segment elevation myocardial infarction (STEMI) in China.

Methods: We analyzed the application of reperfusion guidelines, such as the use of fibrinolytic therapy and percutaneous coronary intervention (PCI), aspirin, angiotensin-converting enzyme (ACE) inhibitors, β -blockers, and cholesterol-lowering agents in patients with acute STEMI who entered the project from 12 hospitals in the country.

Results: (1) Almost 33% of STEMI patients received no reperfusion; 50% received primary PCI, and 20% received fibrinolytic therapy. (2) Age > 75 years and comorbidity with diabetes were predictors for patients who should not receive any type of reperfusion therapy. (3) Although the rate of administration of aspirin was nearly 100%, administration of β -blockers was 65.2% to 71.4%, ACE inhibitors was 52.1% to 60.4%, and cholesterol-lowering agents was 69.8% to 73.5%. (4) Duration of hospital stay in patients who received primary PCI was shorter than those who did not. (5) The curative effectiveness for in-hospital patients who received primary PCI was better than those who did not receive primary PCI.

Conclusion: There is room for improvement for application of reperfusion guidelines, such as in the use of fibrinolytic therapy and primary PCI, aspirin, ACE inhibitors, β -blockers, and cholesterol-lowering agents, in patients with acute STEMI in China.

■ AS-16

Clinical Results of Intravascular Ultrasound-Guided Distal Protection Therapy for Acute Myocardial Infarction. T.

Tsubota, T. Muramatsu, R. Tsukahara, Y. Ito, K. Hirano, Y. Furuse, S. Nishimura. Division of Cardiology, Kawasaki Social Insurance Hospital, Kanagawa, Japan.

Background: No-reflow phenomenon after reperfusion therapy of acute myocardial infarction (AMI) can lead to deterioration of cardiac function in the long term. Although the distal protection device has come into use in daily practice, the efficacy for clinical outcome has not been proved. We examined clinical results of intravascular ultrasound (IVUS)-guided distal protection therapy for AMI.

Methods: From February 2003 to September 2004, 192 patients with AMI were admitted our hospital. Group I (67 patients) treatment consisted of IVUS-guided percutaneous coronary intervention (PCI). Group D (30 patients) treatment consisted of distal protection therapy for all patients without IVUS guidance. Criteria for IVUS-guided distal protection therapy included (1) an external elastic membrane (EEM) cross-sectional area (CSA) at the culprit site $> 20 \text{ mm}^2$, (2) an EEM CSA at the distal lesion site $> 18 \text{ mm}^2$, (3) echolucent area or plaque rupture, (4) attenuation, and (5) thrombus. Exclusion criteria were (1) AMI ≥ 24 hours from development of symptoms, (2) low ejection fraction (< 0.40), (3) previous MI, (4) cardiogenic shock, and (5) Killip class > 3 . Endpoints of this study were (1) occurrence of slow and no-reflow phenomenon, (2) thrombolysis in myocardial infarction and blush grade, (3) change of ejection fraction, (4) major adverse cardiac events (cardiac death, recurrent MI, coronary artery bypass grafting) at 6-month follow-up.

Results: In Group I, 30 cases (45%) received aspiration therapy with a distal protection device. There was no difference in patient background, lesion characteristics, and arrival time from onset between groups.

Conclusion: Short-term clinical results showed that IVUS-guided PCI was equivalent to thrombus aspiration therapy with distal protection.

■ AS-17

A Comparative Study on Transradial Versus Transfemoral Artery Access for Primary Percutaneous Coronary Intervention in Patients with Acute Myocardial Infarction. X. Fu, J. Liu, W.

Wu, X. Gu, S. Li. The 2nd Hospital of Hebei Medical University, Shijiazhuang, China.

Background: Compared with transfemoral artery access for primary percutaneous coronary intervention (TFA-PPCI), transradial artery access for primary percutaneous coronary intervention (TRA-PPCI) has many advantages. This prospective comparative study aimed to analyze the feasibility and effectiveness of performing PCIs through the radial artery in patients with acute myocardial infarction (AMI) with stable hemodynamics in China.

Methods: A total of 208 patients with AMI episodes occurring within 12 hours (159 men, 49 women; age, 58.9 ± 11.9 [range, 34 to 88] years) were randomly divided into a TRA-PPCI group (106 cases) and a TFA-PPCI group (102 cases) from September 2000 to August 2002. Protocols of the manipulation duration, effectiveness, and the incidence of complications, such as bleeding, vessel injury, thrombi, and embolism of TRA-PPCI and TFA-PPCI procedures were compared, as well as the incidence of vessel spasm. The inner diameter and blood velocity of the right and left radial artery as well complications of the radial artery were compared 1 month after the TRA-PPCI procedure.

Results: There were 2 cases in each of TRA-PPCI groups and TFA-PPCI groups that crossed over each other because of the failed procedure of the transradial or transfemoral access. A total of 106 vessels associated with 28 vessels of total occlusion in TRA-PPCI group and 102 vessels with 34 vessels in total occlusion in TFA-PPCI group underwent angioplasty. There were no significant differences in the average time of puncture in the access artery, of engaging in target vessels of guiding catheters, door to balloon time, and time of the total procedure of PCI between the 2 groups, respectively ($18.3 \pm 3.3 \text{ sec}$ vs $16.9 \pm 4.2 \text{ sec}$; $6.0 \pm 1.6 \text{ min}$ vs $5.8 \pm 0.9 \text{ min}$; $45.3 \pm 19.6 \text{ min}$ vs $42.8 \pm 22.7 \text{ min}$; $49.2 \pm 24.1 \text{ min}$ vs $46.5 \pm 26.4 \text{ min}$, $p > 0.05$). The success rates of the first-time puncture in the access artery, the restoration of patency in the infarct-related artery, and PPCI were similar in the TRA-PPCI and TFA-PPCI groups (93.4% vs 96.1%; 100% vs 100%; 96.2% vs 97.1%; $p < 0.05$). The access artery complications, such as bleeding, thrombosis/embolism, as well as vessel complications

in TFA-PPCI group were much more than those in TRA-PPCI group (12.7% vs 0; 6.9% vs 0; 5.9% vs 0, $p < 0.05$). Although slight artery spasm occurred in 4.7% of the cases in the TRA-PPCI group during PCI, the procedure was continued with administration of medicine to release the spasm. There were no significant changes in the time of the Allen test, the diameter, and the systolic velocity of blood in dual radial arteries before and after PPCI.

Conclusion: Duration and effectiveness by TRA-PPCI are similar to those by TFA-PPCI in AMI with stable hemodynamics. Complications, such as bleeding, vessel injury, thrombi, and embolism, by TRA-PPCI are few. With the benefits of safety and efficiency of anticoagulation, TRA might be selected as an access vessel for PPCI in AMI patients with stable hemodynamics.

AS-18

Short-Term Outcomes of Sirolimus-Eluting Stent Implantation in Patients with ST-Elevation Myocardial Infarction: Comparison with Bare-Metal Stent Implantation. T-H. Yang, Y-H. Kim, K-M. Park, D-W. Park, K-H. Ko, B-R. Choi, S-H. Lee, Y-H. Jung, K-H. Han, C-W. Lee, M-K. Hong, J-J. Kim, S-W. Park, S-J. Park. Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea.

Background: Sirolimus-eluting stents (SES; Cypher, Cordis) are commonly used in primary angioplasty for patients with acute ST-segment elevation myocardial infarction (STEMI). However, the safety and efficacy of SES implantation in primary angioplasty remains unclear.

Methods: From June 2003 to June 2004, 108 consecutive patients within 24 hours of chest pain underwent primary angioplasty. SES and bare-metal stents (BMS) were implanted in 51 patients (group I) and 57 patients (group II), respectively. The 30-day incidence of major adverse cardiac events (MACE), including cardiac death, nonfatal reinfarction, and target lesion revascularization (TLR), was compared between the 2 groups. Triple antiplatelet therapy composed of aspirin (200 mg once daily, indefinitely), clopidogrel (300 mg loading, 75 mg once daily for ≥ 6 months), and cilostazol (200 mg loading, 100 mg twice daily for ≥ 1 month) was prescribed in 24 patients (47.1%) in group I and 23 patients (40.4%) in group II.

Results: Baseline clinical and angiographic characteristics were similar between the 2 groups except for longer lesion length in group I (26.8 ± 12.9 mm vs 22.1 ± 7.8 mm, $p = 0.01$). Cardiogenic shock was noted in 9 patients (22.5%) in group I and 10 patients (17.9%) in group II ($p =$ not significant [NS]). Glycoprotein IIb/IIIa inhibitor was used in 3 patients in each group ($p =$ NS). Procedural success, defined as postprocedural diameter stenosis $< 30\%$ and Thrombolysis in Myocardial Infarction grade 3 flow, was achieved in 88.2% of group I and 89.5% of group II ($p =$ NS). Cardiac death was documented in 3 patients in each group during hospitalization (5.9% in group I vs 5.3% in group II, $p =$ NS). In group I, 1 patient had subacute stent thrombosis and received additional SES implantation. No additional MACE was documented for 30 days. The MACE-free survival rate at 30 days was 92.2% in group I and 94.7% in group II ($p =$ NS).

Conclusion: The use of SES in patients with STEMI compared with BMS appears safe and feasible with similar short-term outcomes.

AS-19

Distal Protection Reduces Infarct Size After Primary Angioplasty in Acute Myocardial Infarction: Magnetic Resonance Imaging Study. I. Rhee, H-C. Gwon, Y.H. Choe, J.H. Choi, S.H. Lee, K.P. Hong, J.E. Park, J.D. Seo. Cardiac and Vascular Center, Sungkyunkwan University School of Medicine, Samsung Medical Center, Seoul, Korea.

Background: A recent study showed the distal protection device improved neither ventricular function nor infarct size after primary angioplasty in acute myocardial infarction (AMI). Contrast-enhanced magnetic resonance (CE-MR) imaging may be sensitive enough to show the benefit of the distal protection device. The purpose of this study was to evaluate the efficacy of the distal protection device using CE-MR during primary angioplasty.

Methods: From September 2003 to May 2004, 23 patients who underwent primary angioplasty due to ST-segment elevation AMI within 12 hours after symptom onset were randomized to either PercuSurge GuardWire system (PS group) or no protection (control group). All patients underwent CE-MR before discharge (6 ± 6 days after procedure). Steady-state and 5-minute delayed CE-MR images were acquired to determine left ventricular ejection fraction (LVEF), regional wall thickening, regional wall motion, and the volume of delayed contrast hyperenhancement (DCH).

Results: There were no significant differences in the baseline clinical and angiographic characteristics between the 2 groups. The procedures were successful without complications in all patients. The PS group was associated with a significantly higher incidence of myocardial blush score 3 compared with the control group (PS, 75%; control, 36%; $p = 0.055$). As shown in the Table, there was no difference in LVEF, regional wall motion, and systolic thickening. The volume of delayed DCH, however, was significantly smaller in the PS group. The incidence of clinical events was similar between the 2 groups during the follow-up period.

	LVEF (%)	Regional wall motion (mm)	Systolic wall thickening (%)	DCH volume (cm ³)
PS	58 ± 2	8.0 ± 0.1	68 ± 3	3.7 ± 2.1
Control	51 ± 3	7.1 ± 0.3	64 ± 7	6.7 ± 2.3
p value	0.067	0.021	0.630	0.002

Conclusion: The distal protection device may be useful to reduce the infarct size after primary angioplasty in AMI. CE-MR may be a useful tool to demonstrate the reduction in infarct size in this setting.

AS-20

Acute Myocardial Infarction from Left Main Occlusion: Clinical Finding and Strategy of Percutaneous Coronary Intervention.

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Background: Acute myocardial infarction (AMI) with a tight occluded left main (LM) coronary artery is not compatible with life. Urgent on-site recognition of this clinical condition and evaluation for percutaneous coronary intervention (PCI) is mandatory.

Methods: We analyzed 40 cases of AMI with LM stenosis on coronary angiography from 1994 to November 2004. The infarct-related artery (IRA) was defined as total LM occlusion, the most severe lesion, or thrombus formation in the lesion. They were divided into 2 groups according to the site of IRA: (1) LM total occlusion or subtotal (group A); and (2) LM stenosis with IRA other than LM (group B). Clinical risk factors, infarction site and electrocardiographic changes, cardiac enzyme changes, hemodynamic changes, medical, invasive therapy, or coronary artery bypass surgery (CABG), and mortality rate were included for analysis.

Results: Of the 40 AMI cases with LM lesion, 31 were men and 9 were women. Group A comprised 14 cases, including 3 cases with total LM occlusion, and group B comprised 26 cases. Group A had significantly higher heart rate (HR) and lower systolic blood pressure. Initial creatine kinase-MB (CK-MB) and maximal CK-MB values were also significantly higher in group A. On electrocardiography, the ST-segment elevation on aVR was also higher. In addition, the Killip classification and left ventricular end-diastolic pressure (LVEDP) were significantly higher in group A.

whereas LVEF was significantly lower in that group. Most had either PCI or CABG. The mortality rate was 64% in group A, whereas it was only 23% in group B. The Table includes the clinical findings.

Clinical finding of AMI with LM lesion

	Group A (n = 14)	Group B (n = 26)	p Value
Male/Female	11/3 (79%)	20/6 (77%)	
Age	65.79 ± 10.15	66.12 ± 9.93	NS
HR (/min)	97.86 ± 33.19	74.12 ± 22.74	0.027
SBP (mm Hg)	105 ± 33.39	136 ± 25.93	0.006
DBP (mm Hg)	63.36 ± 24.33	76.23 ± 14.29	NS
Initial CK (IU/L)	2708 ± 2556	1,021 ± 2,487	NS
Initial CK-MB (IU/L)	147 ± 157	34 ± 33	0.024
Max CK (IU/L)	13,701 ± 16,942	2,115 ± 1,640	NS
Max CKMB (IU/L)	1,150 ± 629	121 ± 99	0.005
RBBB (%)	5 (36%)	4 (15%)	NS
ST ↑ in aVR (mV)	0.12 ± 0.11	0.05 ± 0.08	0.040
ST ↑ in V1 (mV)	0.13 ± 0.11	0.06 ± 0.07	NS
Killip	3.50 ± 0.94	1.88 ± 0.86	0.000
LVEF (%)	37.09 ± 10.60	52.40 ± 13.40	0.001
LVEDP (mm Hg)	35.18 ± 6.18	29.54 ± 8.79	0.038
Medical	2 (14%)	8 (31%)	
PCI (PTCA/Stent)	2/9 (79%)	8/8 (62%)	
CABG	1 (7%)	8 (31%)	
Mortality	9 (64%)	6 (23%)	0.027

Conclusion: The cases of AMI from LM occlusion had significantly higher HR, higher ST-segment elevation on aVR, more shock, worse Killip classification scores, higher LVEDP, and lower LVEF. The mortality rate was as high as 64% in this group, even with urgent PCI and CABG in a majority of cases.

AS-21

Cardiac Magnetic Resonance Imaging in the Acute Phase Predicts Improvement of Left Ventricular Function in Chronic Phase in Acute Coronary Syndrome. S. Miyata, K. Igarashi, J. Furuya, R. Shinohe. Division of Cardiology, Hokkaido Social Insurance Hospital, Sapporo, Japan.

Background: Viable myocardium was recently identified with gadolinium delayed enhancement (DE) on cardiac magnetic resonance imaging (CMR).

Methods: We studied the relation between the total area of myocardium exhibiting DE in the acute phase (within 14 days after acute coronary syndrome [ACS]) and predictors of prognosis of ACS, such as troponin I (TnI), creatine kinase-MB (CK-MB), and ejection fraction (EF), in the acute phase. Moreover, we examined whether DE in the acute phase can predict left ventricular (LV) function in the chronic phase (6 months after ACS). A total of 73 consecutive patients with first ACS all received acute revascularization. CMR was performed on 57 of the 73 ACS patients in the acute phase; 38 (culprit lesion: left anterior descending coronary artery [13], right coronary artery [19], circumflex coronary artery [6]) of 57 patients underwent follow-up CMR in the chronic phase. The EF was measured by CMR. The summation of area of DE (cm²) was calculated in 8 short-axis slices.

Results: Peak myoglobin, peak TnI, and peak CK-MB significantly correlated with the total area of DE (myoglobin: $r = 0.47$, $p = 0.0002$; TnI: $r = 0.60$, $p = 0.0001$; CK-MB: $r = 0.81$, $p = 0.0001$). In the acute phase, EF significantly correlated with the total area of DE ($r = 0.54$, $p = 0.0001$). The EF in the chronic phase significantly correlated with the total area of DE in the acute phase ($r = 0.68$, $p = 0.0001$). The LV function recovery of segments with <50% extent of DE was >75% extent of DE.

Conclusion: The total area of DE in the acute phase significantly correlates with biochemical predictors of LV function in the chronic

phase and actual EF in the chronic phase. The total area of DE as an anatomic indicator of injured myocardium could also be useful to evaluate PCI procedures in ACS.

AS-22

Efficacy of Thrombosuction Using the Export Aspiration Catheter Before or During Primary Percutaneous Coronary Intervention in Acute Myocardial Infarction. W.C. Kang, T.H. Ahn, S.H. Han, E.K. Shin. Cardiology Division, Cardiovascular Center, Gil Hospital, Gachon Medical School, Incheon, Korea.

Background: Effective myocardial reperfusion after primary percutaneous coronary intervention (PCI) for acute myocardial infarction (AMI) in lesions with a large thrombus is limited by distal embolization and slow/no-reflow phenomenon. We evaluated the safety, feasibility, and efficacy of a thrombus reduction technique using the Export Aspiration Catheter (EAC) for thrombosuction before or during primary PCI in AMI.

Methods: We analyzed 62 patients with AMI who underwent primary percutaneous transluminal coronary angioplasty and had a large thrombi burden by angiography using EAC (EAC group: $n = 31$; 25 men; mean age, 54.5 ± 11.6 years) or not using EAC (control group: $n = 31$; 20 men; mean age, 65.5 ± 12.2 years). After primary PCI, angiographic findings and clinical outcomes at 1 month and 6 months were recorded.

Results: Baseline characteristics in the EAC and control groups were similar. Angiographic success rates were 100% (31 of 31) and 87.1% (27 of 31), respectively ($p = 0.113$). After PCI, the number of patients with a Thrombolysis in Myocardial Infarction (TIMI) grade 3 flow rate was higher in the EAC group than the control group (26 of 31 vs 20 of 31, $p < 0.05$), and the corrected TIMI frame count was less in the EAC group compared with the control group (23.9 ± 15.1 vs 34.8 ± 22.5 , $p < 0.05$). Although there was no difference between the 2 groups in myocardial perfusion grade, incidence of distal embolization was more commonly observed in control group compared with the EAC group (5 of 31 [16.1%] vs 0 of 31, respectively; $p = 0.053$). The incidence of major adverse cardiac events at 1 month (0% vs 12.9%, $p = 0.237$) and at 6 months (6.5% vs 16.1%, $p = 0.145$) was not different between the 2 groups. In 31 patients who underwent thrombosuction successfully, gross thrombi were obtained from 25 patients (80.6%), and TIMI flow improved in 19 patients (61.3%) who underwent thrombosuction only, without additional intervention.

Conclusion: Thrombosuction using EAC provides a simple, rapid, and potentially effective method for removal of thrombi burden and restoration of coronary flow before or during PCI in AMI.

AS-23

Optimal Glycemic Control Does Not Predict Lesser Occurrence of No-Reflow and Better 30-Day Outcomes in Patients with Diabetes Undergoing Primary Angioplasty for Myocardial Infarction. C.H. Lee, S.G. Teo, E. Hong, H.B. Wong, A. Low, A. Sutandar, H.C. Tan, Y.T. Lim. National University Hospital, Singapore.

Background: Diabetes mellitus is associated with endothelial dysfunction and platelet activation, which may contribute to the occurrence of no-reflow. We postulated that optimal glycemic control was associated with lower risk of no-reflow and better outcomes among patients with diabetes undergoing primary angioplasty.

Methods: Patients with diabetes who underwent primary angioplasty for myocardial infarction at the National University Hospital, Singapore, from January 2001 to June 2004 were recruited for analysis. No-reflow during angioplasty was defined as Thrombolysis in Myocardial Infarction flow <3 in the absence of mechanical obstruction.

Glycosylated hemoglobin (HbA_{1c}) levels were used to determine the degree of glycemic control. All HbA_{1c} values used for analysis were obtained 8 weeks from the primary angioplasty procedures. Whenever ≥ 2 tests were done, the test performed closest to the primary angioplasty procedural date would be used for analysis. Patients were placed into 2 groups according to the HbA_{1c} value: optimal glycemic control ($<7\%$) and suboptimal glycemic control ($>7\%$). All HbA_{1c} values used for analysis were 8 weeks from the index procedure.

Results: A total of 183 patients with diabetes (93% noninsulin requiring) were analyzed. Glycemic control was optimal in 20.2% and suboptimal in 79.8% of the patients. The median HbA_{1c} of the optimal ($n = 37$) and suboptimal ($n = 146$) glycemic control groups were 6.5% and 8.5%, respectively. Compared with the suboptimal glycemic control group, the optimal glycemic control group was older and more likely to have hypertension, previous stroke, and renal failure. No-reflow occurred in 16% of the optimal and 18% of the suboptimal glycemic control group. Multivariate analysis showed that optimal glycemic control was not associated with lesser occurrence of no-reflow (odds ratio, 0.8; 95% confidence interval, 0.2 to 8.2; $p = 0.8$). The optimal glycemic control group had 30-day survival (90% vs 93%, $p = 0.7$) and 30-day event-free survival (84% vs 86%, $p = 0.7$) rates similar to that of the suboptimal glycemic control group. There was a weak and negative correlation between HbA_{1c} and left ventricular systolic function.

Conclusion: Among patients with diabetes undergoing primary angioplasty, optimal glycemic control was not associated with lesser occurrence of no-reflow or better 30-day outcomes.

AS-24

Rate of Distal Embolization in Primary Angioplasty in Acute Myocardial Infarction Without Distal Embolization Prevention and Thrombectomy Devices. A. Wong, D. Nait, C. Phay, E.H. Ng, C. Chan, T.H. Koh. National Heart Centre, Singapore.

Background: The pathophysiology of acute myocardial infarction (AMI) is the formation of occlusive thrombus at the site of plaque rupture. Primary angioplasty (PA) has become the preferred treatment of AMI in the large cardiac center. However, disruption of the thrombus during PA frequently leads to distal embolization (DE) of thrombus. We studied the incidence of DE in AMI during PA before the introduction of DE prevention or thrombectomy devices.

Methods: A total of 50 consecutive patients with AMI in 1998 treated with PA in our center before the introduction of DE prevention or thrombectomy devices were selected, and coronary angiograms were reviewed in detail. Angiographic manifestations of DE were graded as slow flow (SL), no-reflow (NRF), or macroscopic embolization (ME). Thrombolysis in Myocardial Infarction (TIMI) flow grade was assessed before and after the procedure.

Results: The mean age was 57.3 ± 9.6 years. Most patients had single-vessel disease (58%), followed by double-vessel disease (30%), and triple-vessel disease (12%). All patients had balloon predilation, and 74% had stent implantation. The overall rate of DE in our study was 38%, with 26% and 16% having angiographic evidence of ME and NRF, respectively. ME was found to be higher in the right coronary artery (RCA) at 56%, compared with non-RCA vessels at 12% ($p = 0.002$). Total occlusion (TIMI 0) of the infarct-related artery pre-PA also resulted in a higher ME when compared with non-total occlusion (TIMI 1 to 3) of the infarct-related artery (35% vs 12%, $p = 0.039$).

Conclusion: The incidence of DE was high during PA. Infarcts with TIMI 0 flow grade and in particular, RCA lesions, had a significantly higher rate of DE compared with TIMI 1 to 3 flow grade and non-RCA lesions, respectively. Therefore, the use of DE prevention or thrombectomy devices during PA, especially in totally occluded RCA lesions, may be beneficial in reducing embolic events during PA.

AS-25

Primary Percutaneous Coronary Intervention in the Octogenarian. Y-C. Wang, C-S. Hung, L-C. Lin, T-D. Wang, H-L. Kao, C-L. Chao, C-M. Lee, K-L. Hsu, F-T. Chiang, C-S. Liao, C-D. Tseng, J-J. Hwang. Yun-Lin Branch Hospital, Yun-Lin Taiwan, and National Taiwan University Hospital, Taipei, Taiwan.

Background: Acute myocardial infarction (AMI) leads to more complications and increased mortality in the octogenarian. Primary percutaneous coronary intervention (PCI) can provide better outcome and less complication than thrombolytic therapy in this population.

Methods: We evaluated data from 35 patients >80 years of age with ST-segment elevation myocardial infarction (STEMI) who were eligible for primary PCI in National Taiwan University Hospital between September 1998 and August 2004.

Results: Of the 35 patients (mean age, 82.5 ± 2.3 years [range, 81 to 88]) with STEMI, 16 (46%) had anterior infarct; 4 (11%) had anterolateral infarct; and 15 (43%) had inferior infarct, including 3 (20%) patients accompanied with right ventricular infarct. Of the 35, 15 (43%) patients were regarded as Killip class I, 5 (14%) patients as Killip class II, and 15 (43%) patients as Killip class IV. Sudden cardiac death was the initial symptom in only 1 patient. The mean delay from onset of symptoms to hospital arrival was 180 ± 132 minutes, and the mean time from hospital arrival to reperfusion was 178 ± 178 minutes. After diagnostic coronary angiography, 31 (89%) patients had multivessel disease. Emergent bypass surgery was performed in 5 patients because of failed PCI or complicated coronary lesions, and stents were implanted in 20 (67%) of the remaining 30 patients. The peak creatinine kinase level occurred at 16 ± 9 hours after onset of symptoms, with a mean value $3,602 \pm 3,572$ U/L. In-hospital death occurred in 7 (20%) patients (profound cardiogenic shock in 5 patients and free wall rupture in 2 patients); 1 patient had major bleeding that presented as simultaneous intracranial and subarachnoid hemorrhage during the hospital course. The mean hospital stay before discharge was 19 ± 22 days.

Conclusion: From our results, octogenarian patients with STEMI had high probability of multivessel disease, prolonged hospital stay, and increased mortality rate. Whether the newer adjunctive pharmacotherapy, revascularization devices, and drug-eluting stents could improve the prognosis in this population deserves further investigation.

AS-26

Are Fractional Flow Reserve and Hyperemic Epicardial Stenosis Resistance Index Useful in Assessing Severity of Coronary Artery Stenosis in Acute Myocardial Infarction? T-Y. Choi, S-J. Tahk, M-H. Yoon, S-Y. Choi, B-J. Choi, Z-G. Zheng, G-S. Hwang, J-H. Shin. Department of Cardiology, School of Medicine, Ajou University, Suwon, Korea.

Background: Fractional flow reserve (FFR) and hyperemic epicardial stenosis resistance index (hESRI) have been applied to evaluate the hemodynamic severity of epicardial coronary stenosis in patients with angina. However, the usefulness of FFR and hESRI in patients with AMI is not clearly defined.

Methods: We studied 65 intermediate lesions of 57 patients (50 men; age, 59 ± 11 years; 17 infarct-related arteries [IRA]). Intravascular ultrasound, percent area stenosis (r-AS), FFR, coronary flow reserve (CFR), and hESRI were measured. All lesions were divided into 2 groups (group 1: $n = 48$, non-IRA; group 2: $n = 17$, IRA).

Results: No significant difference was found in r-AS between the 2 groups (group 1 vs group 2: $75.8 \pm 7.7\%$ vs $74.9 \pm 10.1\%$, $p = 0.752$). CFR was significantly higher in group 1 (3.49 ± 1.00 vs 2.18 ± 0.57 , $p < 0.001$). FFR was significantly higher in group 2 (0.79 ± 0.12 vs 0.71 ± 0.14 , $p = 0.041$). hESRI was lower in group 2 than group 1,

although the value was not significant statistically (0.63 ± 0.45 vs 0.97 ± 0.79 , $p = 0.117$). In group 1, best cutoff values of FFR and hESRI for 75% of r-%AS were 0.75 (sensitivity, 85.7%; specificity, 80.0%; area under the curve [AUC], 0.862) and 0.64 (sensitivity, 78.6%; specificity, 80.0%; AUC, 0.843), respectively. However, in group 2, best cutoff values of FFR and hESRI for 75% of r-%AS were 0.83 (sensitivity, 70.0%; specificity, 71.4%; AUC, 0.750) and 0.43 (sensitivity, 87.5%; specificity, 71.4%; AUC, 0.786), respectively. Concordance rate between FFR and r-%AS in group 1 was 83.3% (sensitivity, 85.7%; specificity, 80.0%; $p < 0.001$; $\kappa = 0.622$, $p < 0.001$) and was 70.6% (sensitivity, 70.0%; specificity, 71.4%; $p = 0.088$; $\kappa = 0.397$; $p = 0.092$) in group 2.

Conclusion: Best cutoff values of FFR and hESRI between 2 groups for predicting r-%AS 75% by IVUS were different despite similar r-%AS of IVUS. Another cutoff value of FFR and hESRI might be applied for the assessment of anatomically significant coronary artery stenosis in IRA compared with non-IRA.

AS-27

Correlation with Coronary Wedge Pressure and Phasic Coronary Flow Velocity Patterns in Acute Myocardial Infarction Patients According to Presence or Absence of Angiographic Collateral Circulation. M-H. Yoon, S-J. Tahk, S-Y. Choi, T-Y. Choi, B-J. Choi, S-G. Ahn, Z-G. Zheng, G-S. Hwang, J-H. Shin. Department of Cardiology, School of Medicine, Ajou University, Suwon, Korea.

Background: In acute myocardial infarction (AMI), it was not clearly defined whether coronary wedge pressure (Pcw) and Pcw/mean aortic pressure (Pcw/Pa) of the infarct-related artery assessed by intracoronary pressure wire were related to the degree of microvascular damage or collateral function. We evaluated the relation among Pcw, Pcw/Pa, and microvascular integrity assessed by intracoronary Doppler wire.

Methods: The study population consisted of 34 patients (32 men; age, 58 ± 12 years) with first AMI. After percutaneous coronary intervention (PCI), we assessed Thrombolysis in Myocardial Infarction myocardial perfusion grade (TMP grade) by angiography. We assessed coronary flow reserve (CFR), hyperemic microvascular resistance index (hMVR), and diastolic deceleration time (DDT) by intracoronary Doppler wire, and Pcw and Pcw/Pa by intracoronary pressure wire. Study patients were divided into 2 groups according to the degree of development of collateral flows before PCI (group 1: $n = 24$; Rentrop collateral grade, 0; group 2: $n = 10$; Rentrop collateral grade, ≥ 1).

Results: After PCI, Pa and Pcw/Pa were higher in TMP 0/1 grade patients compared with TMP 2/3 grade patients (31.4 ± 9.4 mm Hg vs 21.1 ± 2.8 mm Hg, $p = 0.007$; 0.35 ± 0.11 mm Hg vs 0.23 ± 0.04 mm Hg, $p = 0.009$; respectively), and Pcw/Pa correlated significantly with TMP grade, hMVR, CFR, and DDT in group 1 (Table). However, in group 2, there was no difference in Pa and Pcw/Pa in patients with TMP 0/1 and in patients with TMP 2/3 (28.3 ± 8.1 mm Hg vs 32.0 ± 6.5 mm Hg, $p = 0.473$; 0.32 ± 0.09 mm Hg vs 0.33 ± 0.06 mm Hg, $p = 0.740$), and Pcw/Pa did not correlate significantly with TMP grade, hMVR, CFR, and DDT (Table).

	Pcw/Pa(Group 1)		Pcw/Pa(Group 2)	
	r Value	p Value	r Value	p Value
TMP	-0.699	<0.001	-0.096	0.791
CFR	-0.447	0.029	-0.298	0.403
hMVR	0.646	0.001	0.171	0.636
bDDT	-0.633	0.001	-0.147	0.686
hDDT	-0.656	<0.001	-0.133	0.715

Conclusion: Pcw and Pcw/Pa after PCI in AMI seem to represent the severity of microvascular damage of infarct-related myocardium in

patients without developed collateral flows, but may not represent the severity of microvascular damage in patients with already well-developed collateral flows.

AS-28

Does Early Reperfusion Therapy with Primary Percutaneous Coronary Intervention in Patients with Acute Myocardial Infarction Decrease Major Adverse Cardiac Events? D-Y. Nah¹, J.H. Kim¹, J-Y. Lee¹, W-J. Chun¹, K.U. Park¹, D-U. Lee². ¹Department of Internal Medicine, Dongguk University Gyeongju Hospital, Gyeongju, Korea; ²Department of Family Medicine, Dongguk University Gyeongju Hospital, Gyeongju, Korea.

Background: The time between symptom onset and primary percutaneous coronary intervention (PCI) is among the crucial parameters that can influence the prognosis of the patients with acute ST-segment elevation myocardial infarction (STEMI). The aim of this study was to compare major adverse cardiac events (MACE), including clinical restenosis, target lesion revascularization, and cardiac death, between acute STEMI patients who visited the hospital before elevation of cardiac enzymes (group I) and acute STEMI patients with already increased cardiac enzymes (group II).

Methods: Between August 2002 and July 2004, we reviewed 77 consecutive patients who underwent primary PCI diagnosed with acute STEMI. Clinical events and Thrombolysis in Myocardial Infarction (TIMI) flow grade before and after primary PCI were evaluated.

Results: No significant differences in baseline characteristics were noted between the 2 groups (Table).

	Group I (n = 34)	Group II (n = 42)	p
Pre-TIMI flow grade			
grade 0	22 (65.0%)	29 (69.0%)	NS
grade 1	1 (2.9%)	4 (9.5%)	NS
grade 2	5 (14.7%)	1 (2.4%)	NS
grade 3	6 (17.6%)	8 (19.0%)	NS
Post-TIMI grade			
grade 0	0 (0%)	1 (2.4%)	NS
grade 1	1 (2.9%)	5 (11.9%)	NS
grade 2	1 (2.9%)	4 (9.5%)	NS
grade 3	32 (94.1%)	32 (76.2%)	NS
MACE	5 (15%)	7 (17%)	NS
Cardiac death	4 (11.8%)	5 (11.9%)	NS

Conclusion: Despite reperfusion therapy with primary PCI in the early group (group I), no significant difference in MACE and TIMI flow grade was noted in our study. Further study and trials with a greater number of patients with early visits to the hospital without increased cardiac enzyme may be necessary to define the role of early reperfusion therapy with PCI.

AS-29

Predictors of Reperfusion-Mediated Cardiogenic Shock During Primary Percutaneous Coronary Intervention in Inferior ST-Segment Elevation Myocardial Infarction. S-H. Lee¹, J-Y. Kim¹, J-H. Jung¹, H-S. Wang¹, H-S. Jung¹, B-S. Yoo¹, S-O. Hwang², J.H. Yoon¹, K-H. Choe¹. ¹Department of Cardiology, Wonju College of Medicine, Yonsei University, Wonju, Korea; ²Emergency Medicine, Wonju College of Medicine, Yonsei University, Wonju, Korea.

Background: During mechanical reperfusion of inferior ST-segment elevation myocardial infarction (STEMI), stimulation of cardiac vagal afferent endings evokes reflex hypotension and bradycardia, known as the Bezold-Jarisch effect. Predictors of this reflex remain uncertain.

The aim of this study was to evaluate the clinical presentation and predictors of vagal-mediated cardiogenic shock by recanalization during primary percutaneous coronary intervention (PCI) in inferior STEMI.

Methods: We enrolled consecutive 60 patients with inferior STEMI without right ventricular infarction and performed conventional primary PCI. Patients were divided into 2 groups: patients with vagal reflex-mediated shock during the reperfusion therapy who needed inotropic medication or a temporary pacemaker (group 1) and patients without shock during recanalization (group 2). We compared clinical and angiographic characteristics between the 2 groups.

Results: Of the 60 patients with successful reperfusion, 26 (43%) developed significant bradycardia and hypotension after recanalization. There were no differences in age, coronary risk factors, and lesion morphology (lesion location, length, and reference diameter) between the 2 groups. Mean duration of chest pain to reperfusion was shorter in group 1 than in group 2 (248 ± 123 min vs 338 ± 144 min, respectively; $p = 0.017$). Collateral circulation of the infarct-related artery was more frequent in group 2 (47%) than group 1 (23%), $p = 0.049$. Major adverse cardiac events occurred in 2 cases in group 1.

Conclusion: Reperfusion-mediated cardiogenic shock frequently occurred in the recanalization of inferior STEMI during primary PCI. Predictors of this reperfusion phenomenon after recanalization of inferior STEMI were absence of collateral flow and early recanalization (<6 hours) of the infarct-related artery.

AS-30

Impact of Anemia and Mild Renal Insufficiency in Patients Undergoing Direct Percutaneous Coronary Intervention for Acute Coronary Syndromes. I. Hideki, R. Iijima, K. Makino, H. Shinji, H. Hara, T. Tsunoda, M. Nakamura. Department of Cardiovascular Medicine, Toho University Ohashi Hospital, Tokyo, Japan.

Background: Anemia and mild renal insufficiency are associated with an adverse mortality risk in patients undergoing elective percutaneous

coronary intervention (PCI). However, the impact of anemia and mild renal insufficiency in patients with acute coronary syndromes undergoing direct PCI remains unknown. We sought to investigate whether anemia and mild renal insufficiency at the time of PCI predicted in-hospital mortality.

Methods: We analyzed in-hospital mortality in 410 consecutive patients (age, 66 ± 12 years; 88 women) admitted with acute coronary syndromes. Creatinine clearance (CrCl) was determined using Cockcroft-Gault equation, and mild renal insufficiency was defined as CrCl <55 mL/min at the time point closest to PCI. Patients with hemodialysis were excluded. Hematocrit ($<35\%$ was defined as anemia. These patients were grouped into 1 of 4 categories based on CrCl and hematocrit.

Results: In-hospital mortality occurred in 26 patients (6.3%). Anemia and mild renal insufficiency at baseline were present in 29.5% and 26.1%, respectively. In-hospital mortality was 15.9% for patients with mild renal insufficiency compared with 3.0% for those without mild renal insufficiency ($p < 0.0001$). Similarly, a significant increase in mortality was seen with lower hematocrit (15.2% with hematocrit $<35\%$ and 3.6% with hematocrit $\geq 35\%$, $p < 0.001$). The prevalence of anemia and mild renal insufficiency independently predicted in-hospital mortality (Table).

	CrCl < 55 Ht < 35 (n = 65)	CrCl < 55 Ht ≥ 35 (n = 42)	CrCl ≥ 55 Ht < 35 (n = 56)	CrCl ≥ 55 Ht ≥ 35 (n = 247)	p Value
In-hospital mortality, %	16.9	14.3	8.9	1.6	<0.0001

CrCl: Creatinine clearance (mL/min), Ht: Hematocrit (%).

Conclusion: Anemia and mild renal insufficiency in patients with acute coronary syndromes undergoing direct PCI is strongly associated with in-hospital mortality. The combined use of these risk indicators is important in identifying patients at high risk for adverse outcomes.