P12 - Posters - Interventional Cardiology

19 **The Impact of Age on Outcomes in Patients with Acute Myocardial Infarction Undergoing Primary PCI**
I. Teplitsky, A. Assali, H. Vaknin-Assa, D. Brosh, S. Fuchs, T. Bental, N. Shor, K. Ran, E. Lev
Petach Tikva

20 **Diagnosis and Intervention of Non coronary Vascular disease in Patients Initially Referred for Coronary Angiography: Time has Come to be Active!**
Y. Turgeman, S. Sagas, A. Feldman, L. Ilan Bushari, K. Suleiman
Afula

21 **In-stent Restenosis in DES: Clinical Characteristics and Adverse Outcomes**
H. Vaknin-assa [1,2], A. Assali [1,2], S. Ukabi [1], D. Brosh [1,2], I. Teplitsky [1,2], S. Fuchs [1,2], E. Rechavia [1,2], R. Kornowski [1,2]
[1] Petach Tikva, [2] Tel-Aviv

22 **USage of Hemcon for Femoral Hemostasis after Percutaneous Procedures - A Comparative Open Label Trial**
J. Arbel, M. Mosseri, E. Rozenbaum, A. Levi, J. Erel, Y. Neuman, M. Kaneti, R. Orna, N. Erez, M. Aharonof
Kfar Saba

23 **Feasibility and Safety of 4-F Catheter Coronary Angiography and PCI**
A. Hassan, N. Makhoul, A. Shefer, M. Hammoud, D. Sharief, U. Rosenschein
Haifa

24 **Implementation of Transradial Coronary Catheterization Program: Causes and Predictors of Procedural Failure**
K. Suleiman, A. Feldman, L. Ilan Bushari, Y. Turgeman
Afula

25 **Is Aortic Balloon Valvuloplasty in Patients With Inoperable Severe Calcific Aortic Stenosis a Viable Therapeutic Option?**
R. Jaffe, N. Khader, M. Flugelman, R. Wolff, A. Danon, A. Merdler, A. Shiran, J. Shahla, E. Asmir, D. Halon, B. Lewis
Haifa

26 **A Sheathless Guiding System Allowing for Transradial Large Caliber Catheter Use**
D. Meerkin, M. Klutstein, J. Balkin
Jerusalem

27 **PREtreatment with CLOpidogrel in LOw Doses in Stable Angina Pectoris Patient Before Elective Coronary Angiography ± ad hoc Percutaneous Coronary Intervention PRECLOD Trial**
A. Feldman, A. Sabanchiev, Z. Or, L. Ilan Bushari, K. Suleiman, Y. Turgeman
Afula

P12 - Posters - Interventional Cardiology (Cont.)

28 **Primary Percutaneous Coronary Intervention in Patients with Acute Myocardial Infarction: Radial versus Femoral Approach**
K. Suleiman, L. Ilan Bushari, A. Feldman, M. Jabaren, L. Bloch, A.N. Fredberg, Y. Turgeman
Afula

29 **Results of Unprotected Left Main Coronary Stenting Distinguished by Drug Eluting vs. Bare Metal Stenting: A Single Center Clinical Outcome Analysis**
R. Kornowski [1,2], H. Vaknin-assa [1,2], S. Ukabi [1], D. Brosh [1,2], I. Teplitsky [1,2], S. Fuchs [1,2], A. Assali [1,2]
[1] Petach Tikva, [2] Tel-Aviv

30 **The Effect of Time from 1st to 2nd PCI on Location of Repeat PCI**
D. Rosenmann, J. Balkin, Y. Almagor, D. Tzivoni
Jerusalem

31 **Stent Degradation Assessment by Serial Optical Coherence Tomography of Completely Bioabsorbable Salicylate-Based Sirolimus-Eluting Stent**
D. Matsumoto [1], N. Chronos [1], K. Robinson [1], R. Jabara [1,2]
[1] Atlanta, GA, [2] Jerusalem

32 **Six months and One Year Clinical Outcomes After Implantation of Prokinetic BMS in Patients with Acute Coronary Syndrome**
T. Berlin, E. Rozenbaum, J. Arbel, O. Reges, J. Erel, I. Chetboun, M. Mosseri
Kfar Saba

33 **The Use of the TORNUS Catheter - a Novel Penetration Catheter in Five "Uncrossable" Lesions**
M. Klutstein, D. Meerkin, Y. Almagor
Jerusalem

34 **In-hospital Reperfusion Interventions after Acute Myocardial Infarction and their Impact on One-year Mortality in Different Risk Groups of Patients**
Y. Plakht, H. Gilutz, C. Cafri, R. Ilia, D. Zahger, S. Weitzman
Beer-Sheva

The Impact of Age on Outcomes in Patients with Acute Myocardial Infarction Undergoing Primary PCI

Igal Teplitsky, Abed Assali, Hana Vaknin-Assa, David Brosh, Shmuel Fuchs, Tamir Bental, Nurit Shor, Kornowski Ran, Eli Lev

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Background: Age may present a major determinant of cardiac prognosis in STEMI patients. There is conflicting data regarding the impact of age on clinical outcomes of patients undergoing emergent PCI during STEMI. This study aimed at evaluating the impact of age on clinical outcomes among patients treated by primary PCI for STEMI.

Methods and Results: We used our data consisting of all patients treated by primary PCI (≤12 hours) for AMI excluding pts with cardiogenic shock. The clinical results of treated pts studied, distinguished according to 3 age groups are shown in the accompanied **Table**:

	18-<45 y (N=109)	**45-<65 y (N=675)**	**≥65 y (N=465)**	**P**
Age (yes)	39.6±4	55±5	74±7	0.0001
Male	93%	88%	68%	0.0001
Diabetes mellitus	14%	23%	32%	0.0001
Hypertension	15%	42%	60%	0.0001
Smoking	69%	55%	24%	0.0001
Hyperlipidemia	34%	51%	44%	0.002
Multivessel disease	30%	56%	67%	0.0001
CPK	2140±1650	2040±2040	1820±1800	0.2
LVEF	42±10	43±10	40±10	0.5
Anti GP 2B/3A	92%	81%	64%	0.001
Re-MI 1 month	0%	2.7%	4.5%	0.03
Death 1 month	0.9%	1.6%	6.5 %	0.0001
Re-MI 12 months	5.4%	4.9%	9.9%	0.006
Death 12 months	2.2 %	3.7%	13 %	0.0001

Conclusion:1).Young patients who were related on emergent basis using primary PCI for STEMI had lower 1 and 12 months rates of Re-MI and mortality in spite of the same degree of LV damage ;2).These findings can be explained in part by less extensive coronary artery disease

Diagnosis and Intervention of Non coronary Vascular disease in Patients Initially Referred for Coronary Angiography: Time has Come to be Active!

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Background: Atherosclerosis is a systemic disease and pts with one clinical manifestation often have coexistent disease in other vascular bed.
Aim: To identify candidates for non coronary endovascular interventions among pts referred for coronary angiography.
Material and Methods: During 1-10 /2008, 1757 pts were referred for coronary angiography. Based on medical history and abnormal physical findings 68/1757 (3.8%) underwent additional non-coronary angiography. After diagnostic angiography (Dx an) 52/68 (76%) pts needed non-coronary interventions (Interv). All procedures were undertaken by interventional cardiologists. Pts clinical characteristics, number of major risk factors (RF), cardiac history: Angina pectoris (AP), old MI's, previous CABG and angiographic outcome are presented. n-number

Vascular site	n	Mean age (years)	Male/ Female	≥3 RF's	AP	s/p MI's	s/p CABG	Dx an/ Interv
Carotids	14	68±11	10/4	11	11	5	5	4/10
Subclavian	15	67±8	10/5	9	5	6	5	5/10
Renal	13	58±7	8/5	10	7	4	4	3/10
Iliac	21	60±8	17/4	15	8	8	6	3/18
other	5	62±13	3/2	3	3	2	1	1/4

Forty eight of 68 pts (70%) were male and had at least 3 major RF's for atherosclerosis. Thirty four of 68(50%) suffer from AP, 25/68 (37%) had previous MI's and 21/68 (31%) underwent CABG. Fifty one of 52 (98%) procedures were successful. Neither peri procedure complication nor death was reported.
Conclusions: Among coronary pts, medical history and physical examination can be used as a simple initial tool for diagnosis of non coronary vascular pathology.

In-stent Restenosis in DES: Clinical Characteristics and Adverse Outcomes

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Objective: We characterized the pattern, treatment, and outcomes of drug-eluting stent (DES) in-stent restenosis (ISR) in a consecutive group of patients treated at our institution.
Methods: We determined the incidence and major adverse clinical events in 117 consecutive patients with DES failure aiming a series of 4394 who received DES between 1/2004 and 11/2008. We analyzed clinical data, procedural parameters, and outcomes of DES restenosis. Patients with stent thrombosis were excluded.
Results: The incidence of DES failure presented as ISR was 2.7%. Stents with ISR were Cypher (n=90), Endeavor (n=22), and Taxus (n=9). The mean time to restenosis was 13.9±11.6 months. Mean age in the ISR group was 65±11 years, 77% were male, and 60% had diabetes mellitus. Lesion locations were mostly in the LAD (40%). Unstable angina was the clinical presentation in 70 (60%) patients, and 21% had already prior ISR events. At six-months, 6 patients developed myocardial infarction (5%), restenosis at follow-up was diagnosed in 12 patients (10.3%) and the overall major adverse cardiac events were 14.5% (17 patients), and two patients died (1.7%).
Conclusions: According to our experience, DES-related ISR is relatively infrequent but remains a major clinical problem and a therapeutic challenge. It occurs more frequently in diabetics and complex lesion subsets. The overall intermediate-term prognosis following repeat PCI is tolerable.

USage of Hemcon for Femoral Hemostasis after Percutaneous Procedures - A Comparative Open Label Trial

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Hemostasis of the femoral artery after percutaneous coronary angiography (PCA) is time consuming and uncomfortable for the patient. The Hemcon pad is routinely used by the US army to control traumatic bleeding. It contains Chitosan, a positively charged carbohydrate that attracts the negatively charged blood cells and platelets and promotes clotting. We aimed to test the efficacy and safety of the Hemcon pad for femoral hemostasis after PCA. Primary (efficacy) endpoint was time to hemostasis. Secondary (safety) endpoint was complication rate.

Methods

Patients undergoing PCA were 1:1 randomized for manual compression with either regular or Hemcon pad. All patients received 2500 u of heparin. Excluded were patients >80 years old, systolic blood pressure >150mmHg, known bleeding tendency; STEMI, or receiving IIb-IIIa antagonists, unfractionated heparin or LMWH within 8 hours before or during the procedure. Time to hemostasis, incidence of minor and major bleeding, hematoma size and post procedural stay at the hospital were compared between the 2 groups. Sixty patients in the Hemcon group and 60 patients in the Control were recruited. Activated clotting time before manual compression was similar in both groups 182.4±45.4 and177.8±34.7 secondes in the Hemcon and Control group respectively. Time to hemostasis was 5.7 and 8.3 minutes in the Hemcon and control groups, respectively ($P<0.001$). Hematoma developed in 5% and 16.6% of patients in the Hemcon and Control group, respectively.

Conclusion

The Hemcon pad significantly decreased time-to-hemostasis compared to regular pad. The total incidence of hematoma was also decreased in the Hemcon-pad compared to regular-pad group.

Feasibility and Safety of 4-F Catheter Coronary Angiography and PCI

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Introduction and Objective:
Recently there is a trend for miniaturization of catheter diameter in diagnostic and interventional procedures, to reduce bleeding and promote early ambulation. In this study we examined the feasibility, safety and utility of 4F catheterization (4F CA)

Methods:
We analyzed retrospectively our experience in 4F CA from 01/2008 till 10/2008.
A 4F approach was chosen in patients with expected low probability of CAD and need of PCI . Patients needing primary PCI or programmed PCI were excluded.

Results:
A total of 302 Patients underwent 4F CA, In 287 (95%) 4F CA was satisfactory.
Only 15 patients (5%) needed upgrading to 5F or 6F catheters to achieve good diagnostic angiographic views, 11 of them had significant CAD-(five had significant LM disease) and were referred to CABG , in five an IAB was inserted.
In 213 patients (70%) the 4F CA was only diagnostic; 134 had normal or non-significant CAD and 79 had 1-3 VD, 38 of them needed CABG and 41 for conservative treatment.
In 74 Patients (25%) PCI was performed, using 6F catheters in 66 pts and recently a 4F sheath-less PCI was performed successfully in 8 patients.
Minor bleeding, local hematomas at puncture site occurred in 5 of the 81 pts with 6F and in non of the 4F group. Major bleeding occurred in 2 pts of each group. No complications in the sheath-less group.

Conclusions:
In this observational study, the 4F CA was feasible, safe, and suitable in the majority of patients .Bleeding complications were reduced and earlier ambulation was achieved. A 4F sheath-less PCI potentially may be used more in the future to reduce bleeding complications of the 6F PCI.

Implementation of Transradial Coronary Catheterization Program: Causes and Predictors of Procedural Failure

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The transradial approach (TRA) for percutaneous coronary procedures (PCP) has the advantage of reduced access site complications but is associated with a higher rate of procedural failure compared to transfemoral approach.
Objective: To evaluate the causes and predictors of procedural failure during implementation of transradial program.
Methods: Single center, prospective, non randomized registry of all patients who underwent PCP since implementation of transradial program in November 2005 through June 2008. Procedural outcomes and causes of failure were prospectively collected.
Results: TRA was attempt as first choice in 1959/4831 (41%) of PCP, 66.9% male, mean age 60.5±11.8 years, Coronary intervention was performed in 941/1959 (48%) patients. Procedural failure was 5% (n=98).
Causes of procedural failure were inability to puncture the radial artery (58.2%), complex arterial anatomy (21.4%) inadequate catheter support (11.2%) and spasm (9.2%).
Multivariate forward stepwise logistic regression analysis revealed:

	Failure rate	Adjusted Relative Risk of failure (95% Confidence Interval)	P value
Age ≥70 years (n=477)	9.4%	2.49 (1.61-3.86)	<0.0001
Age < 70 years (n=1481)	3.6%		
Females (n=648)	7.7%	1.88 (1.22-2.89)	0.004
Males (n=1311)	3.7%		
< 200 procedures per operator	8.0%	3.26 (2.06-5.15)	<0.0001
>200 procedures per operator	3.3%		

Other variables were not found to be predictors of failure.
Conclusion: Inability to access the radial artery is the main cause of failure. Old age, female gender and limited experience are independent predictors of transradial procedural failure.

Is Aortic Balloon Valvuloplasty in Patients With Inoperable Severe Calcific Aortic Stenosis a Viable Therapeutic Option?

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Background: . Aortic valve replacement is the standard treatment for severe aortic stenosis. Aortic balloon valvuloplasty (ABV) carries lower acute procedural risk than surgery but has a high restenosis rate. In view of the increasing number of patients with aortic stenosis who are inoperable due to advanced age or other comorbidities, we reinstated a balloon valvuloplasty program as palliative treatment for this high-risk patient population.
Methods: Between May and October 2008 10 patients underwent ABV. All were declared inoperable by consensus with cardiac surgeons prior to ABV. Clinical characteristics and patient outcomes were analyzed.
Results: Mean age was 81±8 years, Euroscore 14±4, estimated surgical mortality 48±27% and 6/10 were female. Following ABV, aortic valve area increased from 0.77±0.12 to 1.06±0.11 cm^2, maximal pressure gradient decreased from 69±13 to 49±14 mmHg and mean pressure gradient from 39±6 to 30±9 mmHg. During 81±66 days of follow-up 2 patients died. A 78 year-old man on mechanical ventilation and dialysis with end-stage heart failure, severely reduced ventricular function, and previous bypass surgery who had been transferred from another hospital, died during the procedure. An 88 year-old woman improved clinically following ABV but died suddenly 2 weeks later. An additional patient underwent repeat ABV after 5 months due to restenosis. The remaining 7 patients have improved functional capacity and have not needed hospital readmission for cardiac symptoms.
Conclusions: 1. Aortic balloon valvuloplasty is a viable palliative therapeutic option in inoperable patients with severe aortic stenosis. 2. A relatively small increase in valve area may translate into significant clinical improvement. 3. Long term follow-up in a larger cohort is planned to assess the value of this approach in relation to standard surgical treatment and to reported outcomes of percutaneous valve implantation.

A Sheathless Guiding System Allowing for Transradial Large Caliber Catheter Use

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Background: Transradial angioplasty has been demonstrated to have significant benefits over traditional transfemoral approach, particularly safety due to reduced access site bleeding and patient comfort. Due to the smaller diameter of radial artery, the use of large caliber guiding catheters is limited as it results in increased pain, spasm and radial artery attrition. The development of the Sheathless guiding catheter with hydrophilic coat, allows for the use of a 6 or 7F equivalent guiding catheter in the coronary artery with access site caliber equivalent to 4 and 5F sheaths.

Methods: In 50 consecutive cases the Sheathless guiding system was used. Following a diagnostic study using 4 sheath, either a 6.5 or 7.5 Sheathless catheter was used. If a 5F diagnostic sheath was used, a 7.5F system was deployed.

Results: PCI was performed to 23 LAD, 19 Cx, 16 RCA, 2 SVGs, 1 LM and 2 renal arteries in 36 male and 14 female patients. The range of stent lengths were 2.5-5.5mm with a diameter range of 12-30mm. There were 3 chronic total occlusions, 9 bifurcation lesions and 12 acute myocardial infarctions treated. GP2B3A inhibitors were administered in 13 cases. A range of additional hardware including protection devices, aspiration catheters, kissing balloons, snares, Cutting Balloons, Tornus, and Twinpass catheters were all used without limitation. In all cases the catheter was removed at the completion of the procedure without any resistance. Three mild and 1 moderate-sized hematoma were noted, all in patients treated with 2B3A inhibitors. No patients required an intervention, blood transfusion, or delayed discharge.

Conclusions: The Sheathless guiding catheter system is feasible and safe allows for the use of large caliber guiding catheter from the radial artery, providing almost unrestricted use of this approach even in the most complex lesions and smallest patients.

PREtreatment with CLOpidogrel in LOw Doses in Stable Angina Pectoris Patient Before Elective Coronary Angiography ± ad hoc Percutaneous Coronary Intervention PRECLOD Trial

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Introduction: Pretreatment (Pretr) with 300mg Clopidogrel (Clop) ≥6 h before planned PCI in stable AP patients (pts) is strongly recommended by ECS and ACC/AHA/SCAI Guidelines. Pretr with 600mg Clop before elective coronary angiography (ECAG) with optional immediate percutaneous coronary intervention (PCI) increased bleeding complications.

Aim: We studied efficacy and safety of 300 mg Clop pretreatment for all ECAG candidates.

Methods: In retrospective manner we compared outcome in 2 groups of pts underwent ECAG±PCI in 2007-2008: Group A – without Clop Pretr (100 pts) and Group B with Clop 300mg Pretr 4-6 h before the procedure (102 pts).

Patients' characteristics: 202 consecutive stable AP pts at mean age 60±10, 68% males. There were significantly more pts with hypertension, hyperlipidemia and NYHA class II-III in group B without significant differences in other baseline characteristics.

Results:

	ECAG±PCI	ECAG±PCI		ECAG only	ECAG only	
Variable	No Plavix (Group A)	Plavix (Group B)	P	No Plavix	Plavix	P
Number of patients	100	102		63	49	
Referred or CABG	4.0%	7.8%	.23	6.3%	14.2%	.15
Periprocedural MI	1.0 %	1.9 %	NS	0.0 %	0.0 %	----
In hospital MACE	2.0 %	1.9%	NS	0.0 %	0.0%	----
Major Bleeding	1.0 %	0.0 %	.49	0.0 %	0.0%	----
Port entry bleeding	1.0 %	2.9 %	.62	0 %	4.08%	.11
MACE 180 d	5.0 %	1.9%	.27	4.76%	0.0%	.12
Chest pain hosp 180d	10.0%	6.8%	.24	6.3%	2.0%	.08

Conclusions: Pretreatment with 300mg Clopidogrel 4-6 hours before ECAG ± *ad hoc* PCI is reasonable and safe.

Primary Percutaneous Coronary Intervention in Patients with Acute Myocardial Infarction: Radial versus Femoral Approach

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Primary percutaneous coronary intervention (PPCI) for myocardial infarction (MI) is associated with increased risk of access site complications due to intense anticoagulation and antiplatelet therapy. The transradial approach although more demanding eliminates such complications.

Objectives: To assess the efficacy and safety of radial versus femoral approach in PPCI.

Methods: We studied 100 patients who underwent PPCI in ADMIT (Aspiration Device in MI Trial): A randomized prospective single center trial. All data were prospectively collected.

Results: In 61 patients (61%) the procedure was performed via femoral and 39 (39%) via radial artery. Results are shown in the table:

	Radial group (n=39)	Femoral group (n=61)	P value
Mean age	57.3±10.7	57.4±13.1	0.975
Women	4(10.3%)	10(16.4%)	0.388
Diabetes mellitus	15(38.5%)	21(34.4%)	0.682
Killip class at presentation	1.33±0.53	1.20±0.48	0.108
IIb/IIIa GP antagonist treatment	35(89.7%)	53(86.9%)	0.521
Procedural results:			
Crossover to alternative entry site	1(2.6%)	0	0.209
Intra-aortic balloon pump insertion	1(2.6%)	11(18.0%)	0.020
Coronary intervention (PCI)	38(97.4%)	55(90.2%)	0.164
PCI failure	1(2.6%)	3(4.9%)	0.305
LAD culprit lesion	22(56.4%)	33 (54.1%)	0.168
Door to wire time (hours:minutes)	0:29±2:04	0:33±3:05	0.339
Door to stent time (hours:minutes)	0:37±2:13	0:38±3:23	0.650
Use of aspiration device	20 (51.3%)	32(52.4%)	0.330
TIMI flow at the end of procedure	2.81±0.54	2.80±0.57	0.650
Significant access site complications*	0	5(8.2%)	0.038
In-hospital death	0	2(3.3%)	0.372
30-day MACE**	6(15.4%)	6(9.8%)	0.340

*Large hematoma, pseudoaneurysm needed blood transfusion or intervention.

** Death, reinfarction or TVR

Conclusion: Transradial is safe and effective as transfemoral approach for PPCI, but with less vascular complications.

Results of Unprotected Left Main Coronary Stenting Distinguished by Drug Eluting vs. Bare Metal Stenting: A Single Center Clinical Outcome Analysis

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Background: Unprotected left main coronary artery (ULMCA) disease is considered a surgical indication in most centers. However, in some cases prohibited from surgery, there is a need for percutaneous coronary intervention (PCI) in ULMCA disease. Our study aimed at assessing the clinical outcomes among patients undergoing stent-based ULMCA angioplasty at our institution and compared the results of drug eluting stents (DES) vs. bare metal stents (BMS) utilization.

Methods: We identified 77 consecutive patients who underwent PCI in ULMCA between 1/2003 and 5/2008. Procedural and angiographic data and clinical outcomes were obtained for all patients (excluding infarction-related cardiogenic shock) and distinguished between DES vs. BMS groups. Clinical follow-up was obtained for all patients at 6 months following PCI. Patients with emergent procedures due to cardiogenic shock were excluded from analysis.

Results: Baseline characteristics and results of ULMCA stenting distinguished by stent group are shown in **Table**:

	BMS (n=29)	**DES (n=48)**
Age (yrs)	77±13	73±11
Male (%)	52	63
Diabetes (%)	24	33
Prior MI (%)	28	42
LV dysfunction (%)	32	29
Distal LM bifurcation (%)	31	52
Renal insufficiency (%)	24	13
Anti-IIB/IIIA utilization	21	50
EuroScore*	11.2±11	7.8±6.4
6 month outcomes		
Death (%)	27	6.3*
MI (%)	3.5	0
CABG (%)	6.9	4.2
Stent thrombosis (%)	0	0
TVR (%)	14.0	4.2
MACE (overall) *	88.0	12.5*

* *Statistical significant difference ($p \leq 0.05$)*

The six-month mortality rate [univariate] was correlated with DES utilization ($r=-0.3$; $p=0.009$).

Conclusion: According to our experiences, in patients deferred from surgery, overall clinical results of unprotected left main stenting are improved using DES.

The Effect of Time from 1st to 2nd PCI on Location of Repeat PCI

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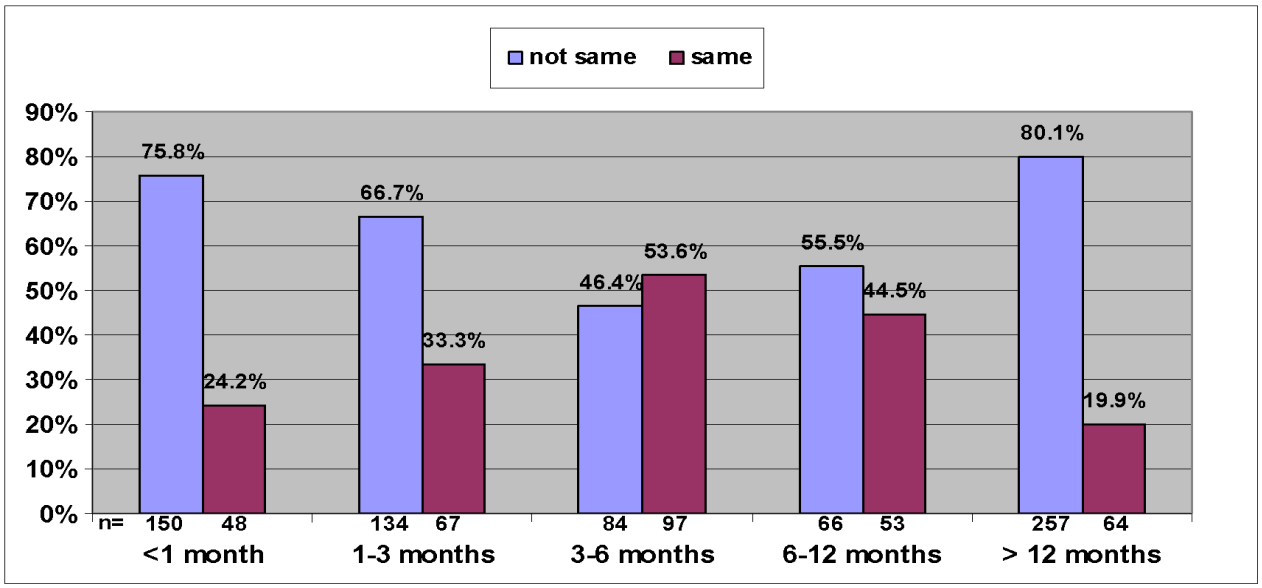
Repeat coronary intervention (PCI) is common in patients undergoing 1st PCI. The purpose of this study was to assess the relation between time elapsed between the 1st and 2nd PCI and the location of the 2nd PCI (same vessel/lesion or different vessel/lesion) in patients receiving both BMS and DES.

Methods; We analyzed demographic and clinical data of all patients who underwent at least 2 PCI's in our department during the era where in 80% of PCI's stents were implanted.

Results: Between 1/2000 and 10/2008, 5163 pts (77% males) underwent PCI in our catheterization laboratories, of whom 1020 patients (80% males) underwent at least two PCI's. The relation between the location of repeat PCI and the time interval between the 2 PCI's is shown in the figure. As can be seen, within the 1st 3 months, most interventions were performed in a different vessel. The highest percentage of reinterventions were performed in SVG's (70%) and LAD (56%). Among these 1020 patients, the first intervention was regarded as urgent in 667 (65.4%). The pattern of repeat intervention (same vessel vs not same) was similar when the 1st PCI was urgent and not urgent.



Conclusion: In most patients who have repeat PCI, the 2nd PCI is performed in a different vessel when occurring during the first 3 months, as well as after 12 months.

Stent Degradation Assessment by Serial Optical Coherence Tomography of Completely Bioabsorbable Salicylate-Based Sirolimus-Eluting Stent

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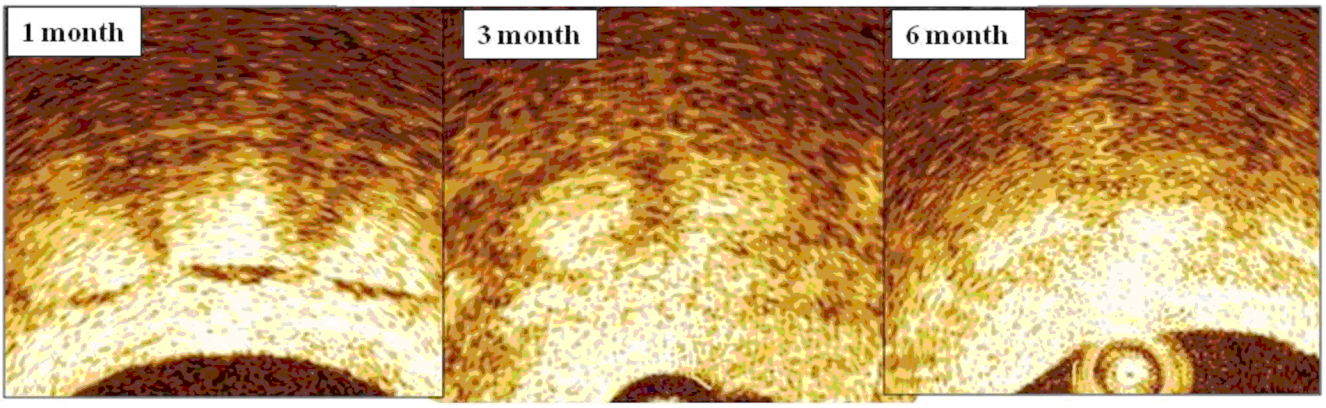
Background: Fully biodegradable stent is an attractive alternative strategy for current permanent metallic stents. We evaluated a novel, fully bioabsorbable sirolimus-eluting stent (8.3μg sirolimus/mm stent) synthesized entirely from salicylic-acid polymer in a clinically relevant animal model.

Methods: Bioabsorbable balloon-expandable stents (n=21) were implanted in pig coronaries using QCA to optimize stent apposition. In vitro studies demonstrated sirolimus elution over 30 days and complete stent degradation in 9-12 months. Animals underwent restudy and terminated at 1 month (1M), 3 month (3M), and 6 month (6M). Thickness and area of each strut (implantation: 1273 struts, 1M: 689 struts, 3M: 585 struts, and 6M: 292struts) were measured. Brightness of struts was semiquantitatively classified into 3 groups: 1) high 2) moderate 3) low signal intensity with or without clear strut border.

Results: Average strut thickness and area at 1M was similar to post implantation (implant: 0.27±0.025mm, 0.14±0.018mm2, 1M: 0.26±0.002mm, 0.12±0.002mm2, respectively, P=NS,). Strut Thickness and area gradually decreased over time (3M: 0.230±0.002mm and 0.093±0.002mm2, P<0.0001; 6M: 0.227±0.003mm and 0.085±0.002mm2, respectively, P<0.0001). OCT signal intensity was decreased with higher frequency of unclear border at 6M (P<0.01).

Conclusions: Degradation of a novel fully bioabsorbable salicylate-based stent was demonstrated by OCT. The size of this stent was remarkably decreased from 1M to 3M and 6M.



Six months and One Year Clinical Outcomes After Implantation of Prokinetic BMS in Patients with Acute Coronary Syndrome

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Background: Stent composition, design and coating are paramount in determining clinical outcomes. The Prokinetic CoCr stent has 0.0024" thin struts, a double helix design and silicon carbide coating. We hypothesized that this stents` characteristics would be translated into favorable clinical results in high risk patients.
Aims: To evaluate the Prokinetic bare metal stent implanted in patients presenting with acute coronary syndrome.
Methods: We retrospectively studied all patients with acute coronary syndrome who underwent PCI and implanted with a Prokinetic stent between 30.10.2005 and 30.12.2007. Excluded were patients presented with cardiogenic shock, underwent PCI to LM, or had additional stents implanted other than Prokinetic. Six months follow up information was obtained by phone.
Results: Total of 143 Prokinetic stents were implanted in 119 patients (age 64±12.9 years, 78.2% men). Risk factors included hypertension (52.9%), diabetes (29.4%), hypercholesterolemia (68.1%), smoking (33.6%), and positive family history (26.9%). Thirty one percent of patients had unstable angina, 36% had non ST elevation myocardial infarction (NSTEMI) and 32% had ST elevation myocardial infarction (STEMI). Fifty eight percent of the lesions were categorized as B2 and 28% as C type. Stent length was 16.3±6.1 (8-45) and stent diameter was 2.8±0.5 (2-5) mm.
Procedural success was achieved in 99.3 % of lesions. Clinical success was achieved in 97.5% of 119 patients (2 patients had slow, and 1 patient had no coronary flow). Major adverse cardiac events (MACE) rate was 8.5% and 11.1% for 6 months and one year follow-up, respectively. The incidence of cardiac death, MI and TLR at 180 days was 1.9%, 3.4% and 4.3% respectively – exceptionally low figures in this group of patients. The incidence of cardiac death, MI and TLR at one year follow-up was 3.2%, 4.3%, 5.2% respectively.
Conclusions: The clinical outcomes at 6 and 12 months after Prokinetic stent implantation are excellent and may be attributable to its unique combination of composition, design and coating.

The Use of the TORNUS Catheter - a Novel Penetration Catheter in Five "Uncrossable" Lesions

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Severely calcified coronary arteries remain a challenge for interventional cardiologists. Several solutions are available including rotablation, cutting balloons etc, but are not always effective. A novel penetration catheter –Tornus catheter (Asahi Intecc, Aichi, Japan), comprising 8 stainless wires in microscrew design, has been developed for treatment of such lesions, exchange of the wire to a rotablator wire or crossing and treating the lesion with conventional balloons and stents. The Tornus catheter is available in 2.1 and 2.6 French. It is advanced by a simple counterclockwise rotation and retrieved by clockwise rotation.

We describe 5 cases of severely calcified lesions, including 1 primary PCI which could not be crossed with even a 1.25mm balloon.

After crossing with Tornus catheters 2.1 and 2.6 French, it was possible to cross 3 lesions with balloons and stent with good results. Two other lesions were crossed with the small Tornus only: one was rotablated and stented and one only balloon-dilated.

We believe that the Tornus is a new important tool in challenging cases, when everything else has failed. It allows crossing with a balloon or a rotablator wire as needed, in order to complete the revascularization procedure.

In-hospital Reperfusion Interventions after Acute Myocardial Infarction and their Impact on One-year Mortality in Different Risk Groups of Patients

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BACKGROUND: The effect of reperfusion therapy on acute myocardial infarction (AMI) survivors and its interaction with comorbidities has not been fully elucidated. The aim of the study was to analyze the impact of reperfusion on 1-year mortality of post-AMI patients in relation to their case-mix. **METHODS**: Retrospective analysis of 2733 AMI patients (age: 66±13y, 70% males) who survived hospitalization during 2002-2004. Risk index for one-year mortality was developed and validated in this group and included: age, laboratory data tests, ventricular dysfunction and comorbidities. The total score for each patient was calculated as sum of weighed impacts of these parameters. Patients were divided into the 3 risk groups based on total score values of the index. Patients were considered as reperfused if they received reperfusion during the initial hospitalization. The primary endpoint was post-discharge one-year all-cause mortality. The impact of reperfusion in each group was assessed by comparison of mortality rates between the reperfused and non-reperfused patients. **RESULTS**: The main results are presented in the table below:

Risk group (n)	Mortality, %	Reperfusion, %	OR (CI 95%)	p
Low (912)	0.5	66.7	0.12 (0.014-1.11)	0.062
Medium (910)	7.3	53.4	0.33 (0.19-0.57)	<0.001
High (911)	29.5	32.2	0.39 (0.27-0.55)	<0.001

Calculated total risk index for the reperfused and non-reperfused patients in the high risk group were similar. **CONCLUSIONS**: The reperfusion rate in the high risk group was low. However, high risk patients selected for reperfusion benefited from the intervention. We conclude that more high risk patients would probably benefit from reperfusion.