08:30 - 10:30 S1 - Complex PCI and Valvular Interventions Hall A

Chairs: **S. Fuchs**
U. Rosenschein

08:30 **Novel 'Flower-Petal' Technique for Bifurcation Stenting: Feasibility Study in Swine Coronary Arteries**

R. Jabara [1,2], T. Shinke [2], S. Geva [2], N. Chronos [2], K. Robinson [2], K. Yoshihisa [3]
[1] Jerusalem, [2] Atlanta, [3] Toyohashi

08:45 **Coronary Bifurcation Lesion – Predictors for Stent Thrombosis**

H. Vaknin-assa, R. Kornowski, S. Fuchs, A. Assali
Petach Tikva, Tel-Aviv

09:00 **Comparison of 7 Years' Long Term Clinical Outcomes of PCI Versus CABG in Patients with Unprotected LM Disease and a High Operative Risk**

B. Varshitzky, P. Gerganski, G. Marincheva, L. Boguslavsky, H. Danenberg, H. Nassar, D. Admon, A. Keren, A.T. Weiss, C. Lotan
Jerusalem

09:15 **Clinical and Angiographic Features of Small Vessel Stenting in the Drug-Eluting Stent Era**

R. Jabara [1,2], R. Gadesam [2], J. Chen [2], M. Gradman [3], S. King [2], N. Chronos [2]
[1] Jerusalem, [2] Atlanta, GA, [3] California

09:30 **Angiographic Characteristics and Procedural Results of Percutaneous Coronary Intervention for In-Stent Compared to Chronic Total Occlusion**

S. Fuchs [1,2], A. Assali [1,2], E. Lev [1,2], D. Brosh [1], H. Vaknin-Assa [1], I. Teplitsky [1], E. Rechavia [1,2], T. Bental [1], D. Dvir [1], A. Battler [1,2], R. Kornowski [1,2]
[1] Petach Tikva, [2] Tel Aviv

09:45 **Percutaneous Implantation of the Self-Expandable CoreValve for High-risk Patients with Severe Aortic Stenosis: Initial Israeli Experience.**

H. Danenberg [1], A. Segev [2], E. Schwammenthal [2], H. Hod [2], D. Zfat [1], D. Gilon [1], C. Lotan [1], V. Guetta [2]
[1] Jerusalem, [2] Ramat Gan

08:30 - 10:30 S1 - Complex PCI and Valvular Interventions (Cont.) Hall A

10:00 **Percutaneous Balloon Mitral Valvuloplasty: 1990 Versus 2007. Is There any Difference between the "Old" versus "Nowadays"?**

Y. Turgeman, L. Ilan Bushari, A. Feldman, T. Or, A. Sabanchiev, S. Sagas, M. Jaberen, L. Bloch, K. Suleiman
Afula

10:15 **Initial Israel Experience and Results of Transfemoral Aortic Valve Implantation with the Edwards Sapien Valve**

J. Balkin, Y. Almagor, D. Bitran, S. Silberman, J. Fisher, D. Rosenmann, M. Klutstein, D. Tzivoni
Jerusalem

Novel 'Flower-Petal' Technique for Bifurcation Stenting: Feasibility Study in Swine Coronary Arteries

Refat Jabara [1,2], Toshiro Shinke [2], Sarah Geva [2], Nicolas Chronos [2], Keith Robinson [2], Kinoshita Yoshihisa [3]

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Background: Bifurcation stenting is challenging and associated with more adverse clinical outcomes compared to non-bifurcating PCI. A novel 'flower-petal' (FP) technique was devised to cover the bifurcation carina with the flared protruding end of the side branch stent. We compared FP to standard 'crush' (CR) technique in an animal model.

Methods: Sirolimus-eluting stents (SES; n=104) were implanted in 52 bifurcations of 40 pigs (4 LM; LAD/LCx, 19 LAD/diagonal, 26 LCx/marginal and 3 RCA/PDA) guided by intravascular ultrasound (IVUS) using either FP or CR with kissing balloon. Stents in main branch (MB) and side branch (SB) were assessed by QCA for minimum lumen diameter (MLD) and % diameter stenosis (%DS), post implant and at 1-mo follow-up (FU). Lumen area (LA) and minimum stent area (MSA) at the proximal, bifurcation, and distal part of the MB stent and at the ostium and distal part of the SB were assessed by IVUS. Hearts were harvested and perfusion-fixed 1 mo post-implant and stented vessels were embedded in plastic. Sections were cut in long-axis orientation through the bifurcation and examined for general morphology.

Results: 34 pigs (21 bifurcations with CR and 20 with FP) completed 1-mo FU; 6 pigs died prematurely, one from stent thrombosis. FP and CR both in MB and SB had similar QCA outcome. However, IVUS showed FP had higher MSA (11.5±2.7 vs. 8.4±2.7 mm^2 for CR, $P<0.01$) and LA (8.1±2.2 vs. 5.7±2.4 mm^2, $P<0.01$) at the bifurcation of MB and ostium of SB. Histologic sections revealed arterial wall responses to SES were similar between FP and CR, with variable neointima thickness and composition. Inspissated thrombus and amorphous material was seen in thicker neointima. Inflammation was mostly mild-to-moderate with rare intense infiltrates. Occasionally stent malapposition was seen. One CR sample had calcification at the carina. Endothelial recovery was complete or nearly so in all samples.

Conclusions: Flower-petal bifurcation stenting technique may be superior to CR by ensuring greater stent and lumen area at the bifurcation region of the MB and the ostium of the SB. Coronary arterial tissue adjacent to SES implanted in both configurations was incompletely healed one month post-implant in pigs.

Coronary Bifurcation Lesion – Predictors for Stent Thrombosis

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***Background*:** Coronary bifurcation lesions angioplasty are still related to a higher incidence of periprocedural complications, need for reinterventions, stent thrombosis, and adverse clinical events.

Objective: To identify factors associated with increased risk for stent thrombosis in patients with coronary bifurcation lesion undergoing PCI.

***Methods*:** 505 patients underwent bifurcation lesions angioplasty between 2001 and november 2007 of them 77% male, 16 patients were presented with stent thrombosis.

We analyzed the patient's clinical data and procedural parameter regarding the lesion location, the use of one or two stents, type of stent , final kissing balloon and pts outcomes at one year.

***Results*:** Mean age 63±12 years, 156(31%) diabetic mellitus, 74% had acute coronary syndrome on presentation. Lesion location: 79(55%) LAD/Diagonal artery, 31(6%) in the distal Left Main artery. Multi-vessel disease was present in 339(71%) patients. BMS and DES were use in these patients with 23% Drug Eluting Stent . clinical presentation myocardial infarction was presented in 43 pts (8.5%) one pts developed ST , ACS pts was the presentation of 371(73%) of which 8 pts had ST . Two stents were implanted in 207(41%) of cases, DES at main branch(MB) 290(54.4%)and DES side branch (SB) in 104(20%). Bifurcation lesions Final kissing balloon were preformed in 47%. Anti GP IIb/IIIa GP drug used in 326(65%). At one year follow-up, 16 patients (3.2%) had angiographic stent thrombosis. Most cases of ST were seen at first month 14 pts(2.8%)-While 6(1.2%) pts had ST during hospitalization two pts had late ST. Factors correlated with stent thrombosis included: HTN and lesion length. The use of drug eluting stent in the main branch and final kissing balloon were correlate with lower risks for stent thrombosis (ST)

CONCLUSIONS Our results suggest that:1- DES implantation in bifurcation lesion do not increase the hazard of stent thrombosis compared to BMS. 2-Bifurcation stenting, when performed in patients with AMI/ACS, were not associated with an increased risk for ST. 3-final kissing balloon dilatation decreases ST risk.

Comparison of 7 Years' Long Term Clinical Outcomes of PCI Versus CABG in Patients with Unprotected LM Disease and a High Operative Risk

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Background: Left main coronary disease (LMCD) is still considered a surgical entity. We aimed to assess the long term clinical outcome of patients with significant LMCD who underwent PCI due to high operative risk compared with a similar cohort who underwent CABG.

Methods: Procedural outcomes and MACE during long term follow up were evaluated in patients with LMCD > 50% who had operative mortality risk > 10% according to logistic version of Euro SCORE.

Results: 55 consecutive pts underwent revascularization (CABG / PCI) from January 2000 – to the July 2003 in Hadassah University Hospital.

Group A included 39 pts treated by CABG, with average expected mortality risk of 33.3%. The in-hospital mortality was 15% (n=6). CABG complications were peri-operative MI (n=4), tamponade (n=2), acute graft failure (n=1), major bleeding (n=6, re-exploration in 4); CVA (n=2) and acute renal failure (n=2, one requiring dialysis).

Group B included 16 pts treated by PCI, with average expected mortality risk of 39.3%. Eight pts were in acute MI (shock in 5), in 3 pts PCI was started during CPR, and 5 were elective pts. Eleven pts had prohibitive risk for surgery and 5 pts decided against surgery. There was no in-hospital mortality. PCI complications were CPR (n=3), distal embolization (n=2), severe bradyarrhythmia (n=3) and contrast nephropathy (n=2).

Results of long term follow up (mean 7.5 +/- 1.6 years):

Mortality rate was similar (Group A – 38.7%, group B – 43.8%, p=0.43). Rate of repeat hospitalization was not significantly different (Group A 43.6% versus Group B 37.5%, p=0.44). There were no group B pts who underwent CABG. Rate of revascularization (PCI) was not significantly different (Group A 15.4% versus Group B 12.5%). Two Groups A pts underwent PCI to LM; one Group B pt underwent PCI to unprotected LM due to restenosis.

Conclusions: For patients with significant LMCD and a high surgical risk, PCI is as good as CABG and may be used as alternative strategy with equivalent long term clinical outcomes.

Clinical and Angiographic Features of Small Vessel Stenting in the Drug-Eluting Stent Era

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Objectives: This study was designed to investigate the clinical and angiographic features and procedural outcomes of small-vessel stenting in a real-world experience during the transition era between drug-eluting stents (DES) and bare-metal stents (BMS).

Methods: Using one of the largest single-institutional cohorts, this study evaluated all patients who underwent percutaneous coronary intervention (PCI) from 2002 through-2005. Analysis was restricted to patients receiving a single stent or undergoing balloon-only angioplasty in a single anatomic site. Small-vessel stents (SVS) were defined as 2.00-2.75mm and large-vessel stents (LVS) as 3.00-4.00mm in diameter.

Results: A total of 19,580 stents were placed in 10,396 patients. Of 6,208 patients fulfilling inclusion criteria, 1,630 (26.3%) received SVS, and 4,578 (73.7 %) received LVS. The SVS group had more female (35.5% vs. 26.3%, $p<0.001$) and diabetic (27.9% vs. 24.2%, $p=0.003$) patients than the LVS group. Compared to LVS, SVS lesions were shorter (14.5±5.8mm vs.15.7±6.4mm, $p<0.0001$) and more complex (66% vs. 53% Class B2/C lesions, $p=0.041$). Indicators of procedural difficulty, including: greater contrast volume, number of devices, total inflation time, and fluoroscopy time, were more commonly observed in the SVS group. After adjustment for confounding factors, the incidence of small treatment-vessel diameter was significantly higher amongst the DES versus the BMS group (OR=1.94, 95% CI:1.56-2.36).

Conclusions: In addition to identifying distinct patient, lesion, and procedural performance characteristics, our study, one of the largest single-center experiences in small-vessel PCI, suggests that the availability of DES substantially increased the use of SVS, as opposed to balloon-only angioplasty, in this anatomically challenging setting.

Angiographic Characteristics and Procedural Results of Percutaneous Coronary Intervention for In-Stent Compared to Chronic Total Occlusion

Shmuel Fuchs [1,2], Abed Assali [1,2], Eli Lev [1,2], David Brosh [1], Hana Vaknin-Assa [1], Igal Teplitsky [1], Eldad Rechavia [1,2], Tamir Bental [1], Danny Dvir [1], Alexander Battler [1,2], Ran Kornowski [1,2]

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Background – The frequency of total restenosis occlusion pattern (Mehran classification type IV) of coronary stents range between 7%-10%. Pathology analysis of in-stent total occlusions revealed early neointima proliferation with late reduction in cellularity and a parallel increase in extra-cellular matrix deposition but no calcification. Accordingly, we hypothesized that intervention for in-stent chronic total occlusion (IS-CTO) would be at least as successful as and potentially safer than intervention to native CTO (N-CTO).

Methods – Using the RMC interventional cardiology data base we identified 24 patients who underwent PCI to IS-CTO [BMS (21/24, 88%), Cypher (3/24, 12%)] between 1.2004 and 3.2008. Patient characteristics, angiographic and procedural measures were compared to 119 patients who underwent PCI for N-CTO during the same period.

Results Median time from stent implantation to intervention was 18.5 (2-164) months. Patient baseline characteristics did not differ between groups with a trend for higher rates of diabetes among IS-CTO compared to N-CTO (54% vs. 34%, p=0.1). Location of CTO differed between groups with RCA/PDA dominated IS-CTO (67% vs. 32%, p=0.003). Also, proximal location was more frequent in IS-CTO (63% vs. 38%, p=0.045). Tapering of the stump, bridged collaterals and distal vessel visualization rates were similar among groups as well as use of stiff and hydrophilic wires. Procedural success rates were similarly high (83% vs. 84%, p=0.8). There were one dissection in the IS-CTO and no other complications while intervention to N-CTO was associated with 19 events (11 dissections, 3 acute thrombosis, 1 acute closure and 4 perforation). Overall intra-procedural complication rates did not differ statistically (4.2% vs. 16%, p=0.2).

Conclusions Intervention for IS-CTO is associated with similarly high success rates as PCI for N-CTO and carries an excellent safety profile. These data may support interventions for IS-CTO.

Percutaneous Implantation of the Self-Expandable CoreValve for High-risk Patients with Severe Aortic Stenosis: Initial Israeli Experience.

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Objectives: The prevalence of aortic stenosis increases with advancing age. Once symptoms occur the prognosis in patients with severe AS is poor. The current treratment of choice for these patients is surgical aortic valve replacement (AVR). However, in a large portion of patients, mainly the very elderly and those with major co morbidities, the surgical risk is considered extreme and thus, these patients are decline of surgery. Recently, a percutaneous alternative for surgical AVR has emerged and two percutaneous heart valves are available. In this report we will describe the initial Israeli experience with the self-expandable percutaneous CoreValve.

From September-November 2008, 15 patients underwent percutaneous AVR in two Israeli centers. Mean age was 79.6±7 years, 10 females and 5 males. Mean valve area was estimated by echo as 0.61±0.18 cm^2 with a maximal gradient of 81±18mmHg and a mean gradient of 52±12mmHg. All patients were highly symptomatic with NYHA functional capacity 3 or 4. Extensive cardiological-surgical evaluation considered all as high-surgical risk or inoperable. A single procedural death was recorded and 3 patients (20%) required permanent pacemaker implantation.
30 and 90-days follow-up data will be reported during the upcoming Israeli Heart Meeting

Conclusions: Based on accumulating worldwide and local data, percutaneous implantation of the CoreValve self-expandable valve is a novel promising therapy for high-surgical risk and inoperable patients with severe aortic stenosis.

Percutaneous Balloon Mitral Valvuloplasty: 1990 Versus 2007. Is There any Difference between the "Old" versus "Nowadays"?

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Background: Since its introduction in 1984, percutaneous balloon mitral valvuloplasty (PBMV) became a class I indication for treating pts with symptomatic severe MS in the presence of favorable valve anatomy

Aim: Comparing pts characteristics, echocardiogarphic findings, technical issues and immediate outcome among candidates for PBMV in a time interval of almost 2 decades.

Material and Methods: Clinical files, echocardiographic data (Wilkins score), equipment use, hemodynamic evaluation and immediate outcome were investigated:

Results: Pts clinical characteristics:

	n	Mean age (years)	Gender (F/M)	FCII-III	AF	Repeated PBMV	Preg.	Additional VHD
1990	17	35±6	17/0	6/11	2(12%)	0	2	6(35%)
2007	31	45±±12	24/7	27/4	9(36%)	2	0	14
p value		0.003	0.002	0.004	0.4%			0.05

n- number, AF- atrial fibrillation, Preg-pregnancy

Echocardiography , equipment use, and hemodynamic data:

	Wilkin's Score	Balloon System	TF	MVA b (cm^2)	MVA a (cm^2)	M Gr b (mmHg)	M Gr a (mmHg)	MR >2/4
1990	8±2	OTW	0	1±0.2	1.6±0.3	17±6	8±3	0
2007	9±2	Inoue	2/31	1.2±01	1.6±0.3	12±3	7±3	2/29
p-value	ns			ns	ns	ns	ns	

TF-technical failure, b/a-before/after, M Gr- mean gradient OTW- over the wire.

Optimal result; MVA≥ 1.5 cm^2 was achieved in 12/17 (71%) pts in 1990 and in 25/29 (86%) pts in 2007 (P-0.004). Urgent surgery (OMV +AVR) was needed in one pts during 2007.No death reported during two periods.

Conclusions: Nowadays less symptomatic older women are treated by PBMV in our institute. The higher immediate success rate in 2007 compared to 1990 most probably related to increased operator experience.

Initial Israel Experience and Results of Transfemoral Aortic Valve Implantation with the Edwards Sapien Valve

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We present the initial experience and results of transcatheter aortic valve implantation (THVI) with the Edwards Sapien Valve in Israel, using the trans femoral approach. The patient characteristics are presented in the table below:

Age Years	Sex	CAD	PCI	CABG	Peak Gradient mmHg	AVA cm2	Euro-Score%	Valve-mm
A)65	M	YES	NO	YES	86	0.6	17	26
B)86	F	YES	LAD	NO	95	0.6	69	26
C)82	M	YES	LAD	YES	140	0.5	44	26
D)78	F	YES	NO	NO	94	0.4	24	23

In addition all patients had significant mitral regurgitation, patient A had a porcelain aorta, patient D post bilateral radical mastectomy and both were refused surgery. All patients underwent successful THVI, but there were several complications: patient B had occlusion of the right external iliac artery- treated conservatively, patient D dissection of the femoral artery and repair with goretex graft. Patient B had embolisation of the initial valve, which was retrieved and placed in the descending aorta, and a 2nd larger valve successfully placed. In addition she had pericardial tamponade successfully drained. All patients survived (follow up 2-5 months) and their functional capacity improved from FC4 to FC 1-2.

THVI requires a dedicated programme involving cardiologists, cardiac surgeons, echocardiographers, catheterization laboratory nurses and technicians, as well as complete operating room and anaesthetic support. THVI at this time is indicated only for patients who are not candidates for surgical AVR- with a very high surgical risk (Euoroscore $\geq$ 20).

Conclusion: THVI has the potential to provide definitive treatment for high surgical risk patients with aortic stenosis. The technique has a learning curve and complication rate but overall results are good.