14:55 - 15:45 EC4 - Echocardiography Hall C

Chairs: **D.S. Blondheim**
A. Shiran

14:55 **3-Dimensional Transesophageal Echocardiography Provides Real-Time Guidance During Percutaneous Interventions: Initial Experience**
S. Ben Zekry, S. Guthikonda, N.S. Kleiman, W.A. Zoghbi, S.H. Little
Houston

15:02 **Platelet Reactivity in Patients with a History of Obstructive Prosthetic Valve Thrombosis**
Y. Shapira, T. Bouganim, A. Sagie, M. Vatury, A. Battler, R. Kornowski, E. Lev
Petach Tikva

15:09 **Coexistent, Covert Mitral Disease in Hypertrophic Obstructive Cardiomayopathy: Trap for the Unwary During Transaotric Septal Myectomy**
B. Sheick-Yousif [1], E. Schwammenthal [1], D. Spiegelstein [1], Y. Moshkovitz [2], M. Arad [1], P. Ghosh [1], A. Shinfeild [1], L. Sternik [1], E. Raanani [1]
[1] Ramat Gan, [2] Petah Tikva

15:16 **Not All Created Equal: Mid-term Echocardiographic Follow up of Aortic Valve Replacement with a Biologic prosthesis**
M. Merkin, Y. Plakht, A. Jafar, N. Liel, R. Ilia, C. Cafri
Beer Sheva

15:23 **Trasnthoracic Doppler Sampling of Left Anterior (LAD) and Posterior Descending (PDA) Coronary Artery Blood Velocities: A Step Towards Comprehensive Noninvasive Coronary Artery Velocity Evaluation**
D. Sharif, A. Sharif-Rasslan, C. Shahla, A. Khalil, U. Rosenschein
Haifa

15:30 **Can Lone Atrial Fibrillation Induce AV valve Regurgitation?**
Y. Turgeman, L. Ilan Bushari, M. Jabaren, S. Sagas, A. Feldman, D. Antonelli, A.N. Fredbereg, K. Suleiman, L. Bloch
Afula

15:37 **Repair VS Replacement of the Mitral Valve in Endocarditis**
D. Loberman, J. Lavee, Y. Kassif, L. Sternik, D. Spiegelstein, A. Kogan, E. Raanani
Ramat Gan

3-Dimensional Transesophageal Echocardiography Provides Real-Time Guidance During Percutaneous Interventions: Initial Experience

Sagit Ben Zekry [1], Sasidhar Guthikonda [2], Neal S Kleiman [2], William A Zoghbi [1], Stephen H Little [1]

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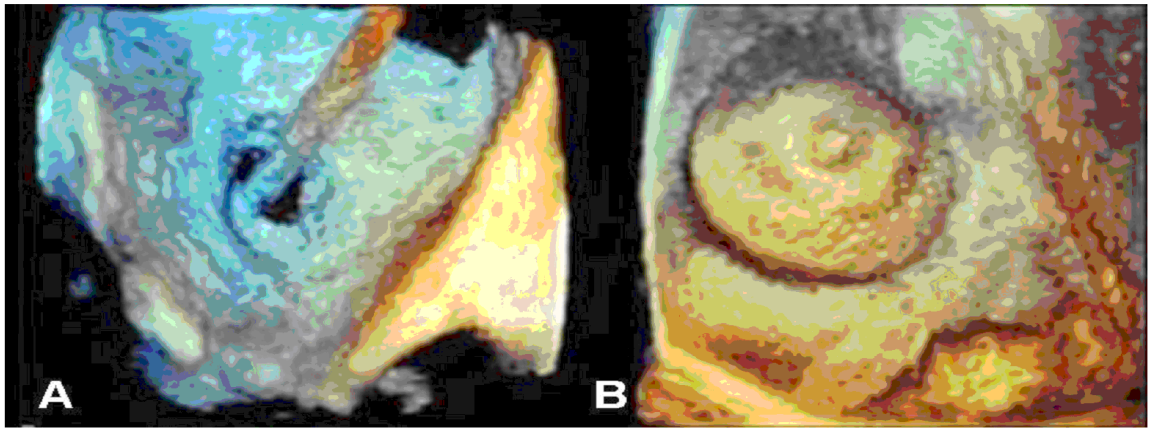
Objective: To describe our initial experience using a matrix array real-time transesophageal (3D TEE) for catheter based interventions, including atrial septal defect (ASD) closure and antegrade percutaneous paravalular repair (PPR). Our hypothesis was that 3D TEE would overcome the limitations of 2D TEE and allow precise visualization of intra-cardiac pathomorphology in real-time and enable accurate visualization of catheters and devices within surrounding environments.

Methods: For each interventional procedure, image guidance by 2D TEE and 3D TEE was qualitatively compared for; 1) assessment of the structural defect location and geometry, 2) continuous catheter visualization, 3) evaluation of closure device position and function.

Results: During 3 cases of secundum ASD closure, 2 mitral and one aortic PPR procedures, the supplemental imaging afforded by 3D TEE was of immediate value. A unique en-face view of the atrial septal defect (from a left atrial perspective) clearly delineated the ASD geometry and simplified closure device sizing and position. 3D TEE, with real-time 3D color Doppler was used to clearly identify the size, location and crescent-like geometry of significant paravalvular regurgitation of a mechanical mitral prosthesis as well as the aortic PPR. For all cases 3D TEE provided continuous catheter and transeptal puncture imaging (Figure A). En-face views of ASD closure device from right and left atria (Figure B) and of the paravalvular occluder (from atrial and ventricular perspectives) provided instantaneous evaluation of device position. Real-time 3D color Doppler provided immediate evaluation of closure device function.

Conclusion: In our experience, real-time 3D TEE during percutaneous intervention provides important additive value regarding structural defect geometry, device delivery guidance and immediate assessment of procedural success.



Platelet Reactivity in Patients with a History of Obstructive Prosthetic Valve Thrombosis

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Background: One of the most serious complications of mechanical valves is obstructive prosthetic valve thrombosis (OPVT –"stuck valve"). Some patients develop OPVT despite an international normalized ratio (INR) in the therapeutic recommended range. We hypothesized that patients who develop OPVT have hyper-reactive platelets. We, therefore, aimed to examine platelet reactivity in patients who developed OPVT, despite therapeutic or near-therapeutic INR, compared with a matched control group.

Methods: We compared platelet reactivity between patients who had an OPVT episode, despite therapeutic or near-therapeutic INR, during the years 1996-2007 (n=19), and a matched group of patients with similar mechanical valves who did not develop this complication (n=19). Platelet reactivity was evaluated by platelet aggregation in response to various agonists, platelet deposition under flow conditions in the Impact-R system and plasma levels of platelet activation markers (soluble CD40-L and P-Selectin).

Results: In the OPVT group the average INR during the index episode was 3.1±1.5, and 42.9±39 months have elapsed from the index episode to the current study**.** Both groups had similar clinical characteristics (mean age 55-57 years, 63.2% women, 15.8% diabetes). Patients with OPVT history had higher aggregation in response to collagen, higher platelet deposition in the Impact-R system, and tended to have higher levels of sP-selection and sCD40L than their control counter-parts (Table).

Conclusion: Patients with a history of OPVT appear to have increased platelet reactivity, which may contribute to an elevated risk of thrombotic complications. These patients would, therefore, likely benefit from the addition of anti-platelet therapy to standard anti-coagulant treatment.

Platelet reactivity tests in the study vs. control groups

TEST	STUDY GROUP (N=19)	CONTROL GROUP (N=19)	P VALUE
Aggregation Collagen 1 µg/ml	67.2±26	49.1±29	0.045
Aggregation ADP 10 µmol/L	68.5±14	65.5±15	0.5
Impact-R: surface coverage %	9.1±3.3	6.5±2.4	0.001
Impact-R: average size (µm2)	43.8±12	36.5±10	0.04
sCD40-L – (pg/ml)	193.3±199	60.8±64	0.06
sP-Selectin – (ng/ml)	3.0±2.3	1.95±0.5	0.07

Coexistent, Covert Mitral Disease in Hypertrophic Obstructive Cardiomayopathy: Trap for the Unwary During Transaotric Septal Myectomy

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Background: Left ventricular outflow obstruction and mitral regurgitation in hypertrophic obstructive cardiomyopathy (HOCM) are usually attributed to systolic anterior motion (SAM) of the mitral valve (MV). Conventional wisdom warrants that effective relief of obstruction by transaortic septal myectomy (TSM) will subsequently result in resolution of mitral regurgitation(MR), even if significant.

Material and Methods: Between January 2004, 27 consecutive patients with HOCM and preoperative significant MR underwent TSM. We describe five patients in whom MR remained significant despite effective TSM. In all 5 patients a reparable cause of the residual MR was identified by intraoperative TEE and the MR was abolished in a second pump-run for MV repair / replacement. In 3 of them, the additional reparable lesion could have been detected by the preoperative study, in 1 patient it became apparent on the preoperative TEE only in hindsight, and in 1 patient the significance of MR became apparent only after TSM. In 2 patients mitral valve replacement had to be performed due to intraoperative evidence of organic mitral valve disease unrelated to HOCM.

Conclusion: In up to 20% of the patients with HOCM and significant MR it may be difficult to predict whether abolishing SAM by TSM may also effectively abolish MR, because of: 1) intrinsic MV abnormalities typical for HOCM – particularly leaflet redundancy; 2) changes in MV configuration following TSM and 3) the potential presence of coincidental organic MV disease. Therefore, the MV of the HOCM candidates for TSM should not only be carefully examined by preoperative TEE, but also by off-pump intraoperative TEE following TSM.

Not All Created Equal: Mid-term Echocardiographic Follow up of Aortic Valve Replacement with a Biologic prosthesis

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Background: Different models of bioprostheses are used to replace the aortic valve in elderly patients. These valves differ in their long term outcome regarding durability and degeneration. The mid term follow up studies in the literature indicate similar outcomes for most of the models. The purpose of this study is to elucidate the mid term outcome of the bioprostheses used in our hospital.

Methods: Retrospectively collected information on consecutive patients undergoing aortic valve replacement with 5 models of bioprostheses from 3/2006 to 9/2008 who had follow up echocardiography in our hospital. The information collected included basic clinical parameters and intraoperative & follow up echocardiography parameters. Multivariate analysis was performed to compare the impact of the model used on mid term echocardiographic outcome.

Results: 104 patients were included, 50% were male The mean age was 73±9 years, patients receiving Magna prosthesis were significantly younger (63±10 years, $p<0.01$), average time to echocardiographic follow up was 122±195 days. Prostheses used were as follows: Magna in 21 patients, Perimount in 24, Mitroflow in 18, Hancock in 10 & Mosaic in 31. Diameters used were: 19mm in 15 patients, 21mm in 53, 23mm in 27 & 25mm in 9. Additional procedures were performed on 53 patients, including CABG on 47. There was no difference in peak systolic velocity across the valve in the intraoperative TEE. In follow up echocardiography the ratio of peak systolic velocity across the prosthesis to peak LV outflow tract velocity was 2.7 ± 0.5 for Magna, 2.4 ± 0.5 for Perimount, 2.8 ± 0.5 for Mitroflow, 2.8 ±0.4 for Hancock & 3.0 ± 0.6 for Mosaic with a significant difference between Perimount & Mosaic prostheses ($p<0.004$ in univariate analysis). A multivariate analysis of 89 patients with complete data was performed using Perimount data as a reference. We found that predictors of peak systolic velocity/peak LVOT velocity greater than 3 were: implantation of Mosaic prosthesis (OR 6.2, $p=0.012$), small diameter of the prosthesis (OR 0.6, $p=0.009$) and male gender (OR 5.4, $p=0.01$). When cohorts were separated according to gender, it was found that only male gender was predictive of a high ratio (OR 8.8, $p=0.021$).

Conclusion: Implantation of a Mosaic prosthesis in the aortic position in men is a predictor of an increased peak transvalvular gradient in mid term follow up. Long term results should be monitored carefully.

Trasnthoracic Doppler Sampling of Left Anterior (LAD) and Posterior Descending (PDA) Coronary Artery Blood Velocities: A Step Towards Comprehensive Noninvasive Coronary Artery Velocity Evaluation

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Recent developments in echocardiography made transthoracic echocardiography (TTE)-Doppler sampling of coronary artery velocities possible. Sampling of left anterior descending (LAD) or posterior descending (PDA) coronary artery velocities by TTE- Doppler is feasible. Aim: Evaluation of feasibility of TTE-Doppler sampling of both the LAD and PDA velocities. Methods: Forty nine subjects, were studied, weight 77.6±16.5 kg. range 46-116 kg. Transthoracic Doppler sampling of the LAD from modified parasternal short axis view and of the PDA from modified apical two-chamber views using 3.5 MHZ transducers was attempted. Results: Successful TTE sampling of the LAD velocities is possible almost in all. Thus, if PDA Doppler sampling was achieved, then velocity evaluation of both the LAD and PDA was possible in all. Peak PDA velocities in diastole 51.1±15.9 cm/sec were higher than in systole 23.2±6 cm/sec, $p<0.001$, similar to the case of the LAD. Time velocity integral in diastole 15.9±5.4cm were higher than in systole 5.1±2.1 cm, $p<0.001$. Diastolic pressure half time averaged 178.3±65 msec and deceleration time 597±212.6 msec. Flow in the PDA in diastole 43.7±20.6 ml/min was higher than in systole 13.8±6.7 ml/min, $p<0.001$. Diastolic to systolic velocity ratio averaged 2.28±0.67, and was less than 1.5 in 3 subjects with severe PDA stenosis. Conclusions: Sampling of Doppler velocities of both the LAD and PDA using TTE is feasible. Diastolic velocities, time velocity integrals and flows were higher than the systolic parameters. Sampling of LAD and PDA velocities may be used in the evaluation of subjects with coronary artery disease and can detect severe PDA stenosis.

Can Lone Atrial Fibrillation Induce AV valve Regurgitation?

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Introduction: Primary structural valve abnormalities and ventricular geometrical alterations are mentioned as a potential causes for atrio-ventricular regurgitation (AVVR).

Aim: testing the hypothesis weather paroxysmal or permanent (> 6 months) lone atrial fibrillation (AF) may induce AVVR.

Material & Methods*:* Forty seven pts with lone AF were evaluated for the presence and severity of AVVR using echocardiographic color Doppler study. Nineteen of 47 (40%) with paroxysmal AF and 28/47 (60%) with persistent AF. Only 9/19 (47%) pts with paroxysmal AF and 17/28 (60%) pts with permanent AF could mention the time period (months) suffering from arrhythmia. Based on color mapping technique ,mitral and tricuspid regurgitation (MR/TR) were graded as: none, mild , moderate, and severe. Significant AVVR was defined as either moderate or severe .Pts clinical characteristics, and AVVR grade in each group are presented:

Results:

Lone AF	**Paroxysmal**	**Permanent**	**P-value**
Number of pts	19	28	
Age (years)	66±7	77±6	P<0.005
Female/Male	12/7	17/11	0.87
No MR/TR	10/13	7/7	0.55/0.003
Mild MR/TR	9/6	15/16	0.68/0.08
Moderate MR/TR	Non/Non	5/4	0.053/0.088
Severe MR/TR	Non/Non	1/1	

Significant AVVR was noticed only in pts with permanent AF. In this group AVVR was associated with mean follow up of 54± 13 months and no AVVR was associated with mean follow up of 13±5 month (p<0.005).

Conclusion: The presence of AVVR among pts with lone AF is quite common, but significant AVVR can be detected only in pts with long standing arrhythmia. Our data showed that lone permanent AF should be considered as a risk factor for AVVR.

Repair VS Replacement of the Mitral Valve in Endocarditis

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Background

Several observational studies have suggested a superior survival after mitral valve repair compared with replacement in patients undergoing surgery for infective endocarditis

A systematic review of literature showed that mitral valve repair is associated with good clinical in-hospital and long-term results among patients undergoing surgery for infective endocarditis . We aim To evaluate our institutional results of mitral valve repair in comparison to mitral valve replacement for infective endocarditis.

Methods

From 2004 to 2008, 377 patients underwent mitral valve repair in our institution, out of them 23 repairs of infected mitral valves. During this time frame, 28 patients underwent mitral valve replacement due to endocarditis. Mitral repair techniques included extensive debreadment, reconstruction of the annulus and mitral leaflets with pericardial patches and repair of the primary pathology. Post operative complications, and midterm follow up of clinical and echocardiography evaluation were compared for the two groups.

Results

There were 1 (4%) in hospital death in the repair group and 4 (15%) in the replacement group. Mean follow up was 14±9 months. Freedom from reoperation was 95% and 86%, in repair and replacement groups, respectively. Freedom from recurrent SBE was 100% in the repair group. Echocardiography follow-up revealed 95% (22/23) and 93% of patients (repair and replacement groups, respectively) were free from moderate or severe mitral regurgitation.

Conclusions

Our experience shows that mitral valve repair is associated with good clinical and midterm results among patients undergoing surgery for infective endocarditis.