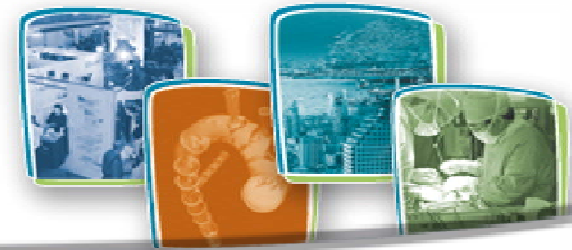


**ICI** Meeting  
**2008**

**Innovations  
in Cardiovascular  
Interventions**



**December 7-9, 2008 | Tel-Aviv, Israel**



# Transcatheter Therapeutics in Structural Heart Disease

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## Scope - congenital and acquired

Fetal interventions

ASD closure

PFO closure

VSD - memb. and musc.

Pulmonary valvoplasty

Pulmonary valve  
implantation

PDA closure

Coarctation dilat. & stent

Vessel occlusion – fistulae,  
collaterals, AVM

Peripheral pulmonary  
arteries

Complex CHD - baffles  
fenestrations

- Mitral valvoplasty
- HOCM - septal ablation
- LV partitioning etc.
- LA appendage obliteration
- Mitral regurgitation
- Paravalvular leak, mitral and aortic
- Post MI septal rupture
- Aortic valvoplasty
- Aortic valve implantation
- Atrial septostomy



## Interventions that have become state of the art treatment

- Closure of patent arterial duct
- Balloon pulmonary valvoplasty
- Closure of most II ASDs
- PFO Closure (choice of device is crucial)
- Balloon mitral valvoplasty
- Balloon aortic valvoplasty in children and adolescents
- Closure of AVM and collaterals
- Dilatation and stenting of pulmonary arteries
- Atrial septostomy
- Dilatation and stenting of aortic recoarctation, coarctation in adults



## Interventions with equal weight to surgery

- VSD, especially perimembranous
- Native aortic coarctation in children
- Paravalvar leak - improved devices and technique. aortic position.
- HOCM - septal ablation
- Post MI septal rupture (surgery still has the edge)



## Rapidly gaining popularity

- Pulmonary valve implantation inside failing RV-PA conduits
- Aortic valve implantation in high surgical risk aortic stenosis
- Hybrid procedures - e.g. transapical aortic valve, transventricular VSD closure in complex malformations



## Awaiting further evaluation

- Obliteration of LA appendage in atrial fibrillation as substitute to anti coag.
- Repair of mitral regurgitation - mitral clip, ring size reduction
- LV partitioning device for remodelling aneurysmatic post MI ventricles

Fetal interventions



## Evaluation of the patient

- Make an accurate diagnosis of all anatomical and hemodynamic findings
- In combined lesions assess the individual weight of each problem. e.g. ASD with severe TR, structural + coronary artery disease
- Assess the functional implications on exercise capacity, arrhythmia etc.
- Know the natural history of the disease process and assess prognosis for the particular patient
- Take into account special considerations e.g pregnancy, diving



## Evaluation of treatment options

- Don't treat the lesion; treat the patient
- Tendency to perform "straightforward" procedures with questionable indication. e.g closure of tiny ducts and PFO
- Evaluate treatment alternatives, mainly surgery but also medical treatment
- Risk of surgery and success rate vs. risk of intervention and success rate



## Borderline indications

- Textbook indication for treating shunt lesions is usually  $Q_p/Q_s=1.5$
- Many patients have gradual dilatation of heart chambers with smaller shunt ( $Q_p/Q_s= 1.3-1.4$ ) especially left heart volume overload (VSD, PDA)
- In our experience, LV gets smaller after closing off these shunts
- Treating a smaller shunt can delay progression of disease in patients with other causes of volume overload. e.g patients with VSD and AR
- Borderline RV pressure overload can cause fibrosis and diastolic dysfunction. Treat PS > 40 mmHg



## Preparation for intervention - anatomy

- Complete anatomical assessment. e.g. - perform TEE for ASD to assess size, rims, pulmonary venous drainage.
- TEE for pmVSD to see aortic rim, AR, TR mechanism, aneurysm
- CT/MRI for aortic coarctation - location, neighboring vessels, size & shape, reference diameters
- Crucial in complex interventions - valve implantations, mitral valvoplasty (access, calcium, coronary anomalies, commissures)



## Preparation for intervention

- Decide the need for anesthesia/sedation
- Mode of intra-procedural imaging: TEE including 3d-TEE, ICE, TTE, fluroscopy alone
- Need for rapid RV pacing
- Need for cross matching of blood products
- Need for surgical back-up
- Pharmacological preparation - stop warfarin, start clopidogrel/aspirin
- Antibiotic prophylaxis



# Choice of device

- safe
- efficient
- user friendly - most importantly; retrievable
- durable
- low cost



## Arguments in favor of intervention

- Older age - is usually not increasing the risk for interventional cath. Surgical risk is markedly increased in old patients
- Surgical risk is higher in associated coronary artery disease, pulmonary hypertension, COPD, diabetes, renal dysfunction, women
- Many interventions can be done without contrast media: ASD/PFO, paravalvar leak. In high risk patients use echo instead.



