Congenital Heart Disease in Adults: Operating Room Concerns for this Patient Population

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SCOPE
- Cardiac malformations occur in 8 per 1000 live births.
- 32,000 new cases in the United States per year.
- 80% of new cases will survive one year.
- 80% of 1-year survivors will survive to adulthood
- >1,000,000 adults with congenital heart disease in the U.S.

No Disclosures
No Lesion is “Cured” by Surgery

- Need for re-operation is prevalent
- Many ACHD patients face multiple sternotomies

40% of Patients Were Undergoing 3rd, 4th or 5th Sternotomy!

Discharge Mortality in Adults with Congenital Heart Disease

20 Year old Man with Tetralogy of Fallot

- Fatigue, decreased exercise tolerance
- PMHx
  - L BTS; 1 month
  - TOF, RV-PA homograft; 1 yr
  - Redo RV-PA homograft; 9 yr

Echocardiogram

- Severe PR
- Severe RA/RV enlargement
- Depressed RV EF 35%
- Depressed LV EF 45%

It’s “Just” a Pulmonary Valve Replacement, Right?
What the Surgeon Needs to Know Pre-op
• ventricular function - TTE
• presence of residual shunts – TTE/TEE
• coronary anatomy - angio, CT, MRI, old op note
• relationship of conduit, Ao, RA, RV, to sternum - CXR, CT,

Redo Sternotomy – What Is At Risk?
RA, RV, Great Vessels

Patient S/P Rastelli Operation
Peripheral Cannulation Options

- Femoral (iliac) artery & vein
- Axillary artery
- Carotid, inominate artery
- Internal jugular vein
- Right atrium via right thoracotomy
- Abdominal aorta
Intra-Op Transesophageal Echo

33 year old Woman with Pulmonary Atresia
Intact Septum Sternotomy #3
Moderate-Severe Tricuspid Valve Regurgitation

Moderate to Severe Tricuspid Valve Regurgitation in Patient with Severe PR, 3rd Sternotomy

- Does it need to be addressed?
- What is the Mechanism of TR?
  - TR 2º to annular dilation – annuloplasty ring
  - Valvular abnormality – repair vs. replacement
- Do we need to make a decision before instituting bypass?
  - Decision to address tricuspid valve alters bypass set up – bicaval cannulation

19 Year Old Man with Tetralogy of Fallot
2nd Sternotomy

Small to Moderate ASD
43 Year Old Man with Tetralogy of Fallot
4th Sternotomy

Patient Foramen Ovale with Positive “Bubble Study”

Residual Intra-Atrial Shunt

- Alters operation approach
  - Cannot perform PVR with “beating heart”
  - If repair performed – bicaval cannulation

- Alters “disaster plan”

Intra-Cardiac Shunts

- Inadvertent Entry into Right Heart
  - decision to expose femoral vessels
  - dissection with femoral cannulation & CPB
  - maintaining AVB - Even More
38 Year Old Woman with Tetralogy of Fallot
3rd Sternotomy

Presence of Aortic Regurgitation
- want to avoid LV distention
- avoid fibrillation
- consider LV vent L chest

20 Year Old Man with Tetralogy of Fallot
- Severe PR
- Severe RA/RV enlargement
- Depressed RV EF 35%
- Depressed LV EF 45%
Operation

- R femoral cannulation
- CPB with sternotomy
- SVC cannula
- Cross clamp for TV/ASD repair
- Beating heart PVR (29 mm Biocor) and RVOT reconstruction

Uneventful recovery

Pediatric/Congenital Heart Surgeons Should Operate on Adults with CHD

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<th>% Mortality</th>
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Ideal Approach for Best Outcomes

- ACHD cardiologist evaluation pre-op
- Congenital heart surgeon performs all operations
- Case conference presentation of all scheduled procedures – includes surgeon, anesthesia, cardiologist, radiologist/imaging, nursing, perfusionist
- ACHD cardiologist in the OR for intra-op TEE
- Communication