HISTORY

Tetralogy of Fallot with pulmonary stenosis, S/P repair with patch closure of the ventricular septal defect and a transannular right ventricular outflow tract patch (88/90).

Cardiovascular MR examination for assessment of right ventricular size and function, pulmonary regurgitation, and branch pulmonary artery anatomy.

FINDINGS

Abdominal Situs: Solitus
Cardiac Position: Levocardia
Cardiac Segments: {S,D,S}
Conus: Subpulmonary

Comparison is made with the prior study on 7/8/07.

Unobstructed right ventricular outflow tract.

Dilated, unobstructed main and branch pulmonary arteries.

Severe pulmonary regurgitation with a regurgitation fraction of 44% by main pulmonary artery flow measurements (antegrade flow 105 ml/beat; retrograde flow 46.4 ml/beat). Prior study 41%.

Dilated right ventricle (indexed end-diastolic volume 188 ml/m2; z-score= 7.25) with mild global systolic dysfunction (ejection fraction 42%). Prior study: indexed end-diastolic volume 162; z-score= 5.4; ejection fraction 47%. The anterior infundibular wall (length ~4 cm) at the presumed location of the patch is thin and dyskinetic. On myocardial delayed enhancement imaging, there is hyperenhancement in that region and a portion of the ventricular septal defect patch.

No significant right ventricular hypertension based on systolic septal configuration.

Normal left ventricular size and systolic function.

No aortic regurgitation.

Dilated aortic root and ascending aorta.

Unobstructed left aortic arch with normal branching. No significant aortopulmonary collaterals.

No residual atrial or ventricular septal defect detected; unable to exclude small defect. Qp/Qs= 1.02.

Normal systemic and pulmonary venous connections.

No pericardial or pleural effusion.

MEASUREMENTS

Heart rate (bpm): 70
Upper extremity blood pressure: 120/80, Mean = 85

Ventricular Data

<table>
<thead>
<tr>
<th>Value</th>
<th>Z-score</th>
<th>(Min - Mean - Max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV diastolic volume (ml)</td>
<td>150.0</td>
<td>-0.07</td>
</tr>
<tr>
<td>LV systolic volume (ml)</td>
<td>60.0</td>
<td>0.36</td>
</tr>
<tr>
<td>LV ejection fraction (%)</td>
<td>60.0</td>
<td>-0.91</td>
</tr>
<tr>
<td>LV stroke volume (ml)</td>
<td>90.0</td>
<td></td>
</tr>
<tr>
<td>LV mass (gm)</td>
<td>130.0</td>
<td>0.61</td>
</tr>
<tr>
<td>LV mass/volume (gm/ml)</td>
<td>0.87</td>
<td>0.67</td>
</tr>
<tr>
<td>LV ES fiberstress (gm/cm²)</td>
<td>110.6</td>
<td></td>
</tr>
<tr>
<td>RV diastolic volume (ml)</td>
<td>348.0</td>
<td>7.25</td>
</tr>
<tr>
<td>RV systolic volume (ml)</td>
<td>205.0</td>
<td></td>
</tr>
<tr>
<td>RV ejection fraction (%)</td>
<td>42.2</td>
<td>-3.48</td>
</tr>
<tr>
<td>RV stroke volume (ml)</td>
<td>147.0</td>
<td></td>
</tr>
<tr>
<td>RV mass (gm)</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>RV mass/volume (gm/ml)</td>
<td>0.29</td>
<td></td>
</tr>
</tbody>
</table>

Normative data for ventricular parameters by MRI from J Magn Res Imag 2003;17:323-329

Anatomic Data

<table>
<thead>
<tr>
<th>A-P</th>
<th>R-L/S-I</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aortic valve annulus (cm):</td>
<td>2.00</td>
<td>3.14</td>
</tr>
<tr>
<td>Aortic root (short-axis view, cm):</td>
<td>3.58</td>
<td>3.79</td>
</tr>
<tr>
<td>Ascending aorta (cm):</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Main pulmonary artery (cm):</td>
<td>4.00</td>
<td>3.80</td>
</tr>
<tr>
<td>Right pulmonary artery (cm):</td>
<td>1.00</td>
<td>2.50</td>
</tr>
<tr>
<td>Left pulmonary artery (cm):</td>
<td>2.20</td>
<td>2.30</td>
</tr>
</tbody>
</table>

Flow Data

Flow Flow Flow/BSA
Ascending Aortic (l/min): 6.00 3.25
Main Pulmonary Artery (l/min): 6.10 3.30
Right Pulmonary Artery (l/min): 2.80 1.52
Left Pulmonary Artery (l/min): 3.30 1.79
Tricuspid Valve Inflow (l/min): 6.90 3.74
Mitrval Valve Inflow (l/min): 6.00 3.25

Flow Fractions and Regurgitant Fractions
Pulmonic Regurgitant Fraction: 0.44
Tricuspid Regurgitant Fraction: 0.13

CARDIOLOGY CODES AND INTERPRETATION
NORMAL PULMONARY VENOUS CONNECTIONS                               300800
TRICUSPID REGURGITATION, MILD                                     173001
RIGHT VENTRICULAR DYSFUNCTION, MILD                               182201
RIGHT VENTRICULAR DYSFUNCTION REGIONAL                            182400
LEFT VENTRICULAR DYSFUNCTION RULED OUT                            181208
TETRALOGY OF FALLOT                                               105000
PULMONARY REGURGITATION, SEVERE                                   165003
DILATATION OF THE MAIN PULMONARY ARTERY                           232400
LEFT AORTIC ARCH                                                  271000
NORMAL ORIGIN OF THE RIGHT AND LEFT CORONARY ARTERIES             309800
S/P VSD CLOSURE, VALVOTOMY AND TRANSMURAL OUTFLOW PATCH FOR TOF  544600

TECHNIQUE
Scanner: Cardiac   Gating: ECG   Coil: 32C-Cardiac
Sedation: None
Gadolinium dose (cc): 28.0
Sequences:
3-plane and interactive localizing SSFP sequences. ECG-gated, breath-hold SSFP cine: ventricular long- and short-axis planes; right ventricular outflow tract long-axis; and axial plane across the pulmonary arteries. Gadolinium-enhanced 3D magnetic resonance angiogram. ECG-gated, breathe-through phase velocity flow measurements: aortic root, main pulmonary artery, branch pulmonary arteries, and atrioventricular valves. Myocardial delayed enhancement imaging in ventricular long- and short-axis planes.

E-signed August 20, 2010, 01:35 PM                              Tal Geva, M.D.