Preliminary Experience in the Use of an Extracellular Matrix (CorMatrix) as a Tube Graft: Word of Caution

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Disclosure

Patrick McConnell
Grant/Research Support- Cormatrix Cardiovascular, Inc; Thoratec Corporation
Consultant- Q test Laboratories; Clear Catheter Systems, Inc

Toshiharu Shinoka
Grant/Research Support- Gunze, Inc
Background

• There are no ideal materials for the repair of congenital heart disease

• Decellularized extracellular matrix from porcine small intestinal submucosa (CorMatrix) has been developed and commercialized
Our Preliminary Experience using CorMatrix as a *Tube Graft*

Central PA reconstruction  \( N=10 \)

Aortic arch interposition  \( N=3 \)
Creation of CorMatrix Tube Graft

The CorMatrix sheet was wrapped around Hegar dilator of the required size and the edge was sutured with 7-0 prolene
### Interposition CorMatrix Tube Graft for Central PA Reconstruction in Comprehensive Stage II Surgery

<table>
<thead>
<tr>
<th>Patient</th>
<th>Diagnosis</th>
<th>Age at surgery (month)</th>
<th>Diameter of tube (mm)</th>
<th>Intervention for tube</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HLHS</td>
<td>9</td>
<td>9</td>
<td>Stent</td>
<td>Fontan</td>
</tr>
<tr>
<td>2</td>
<td>HLHS</td>
<td>6</td>
<td>7</td>
<td>Stent</td>
<td>Fontan</td>
</tr>
<tr>
<td>3</td>
<td>DILV, TGA, IAA</td>
<td>6</td>
<td>9</td>
<td>NA</td>
<td>Sudden death</td>
</tr>
<tr>
<td>4</td>
<td>HLHS</td>
<td>8</td>
<td>9</td>
<td>NA</td>
<td>Fontan</td>
</tr>
<tr>
<td>5</td>
<td>HLHS</td>
<td>6</td>
<td>9</td>
<td>Stent</td>
<td>Fontan</td>
</tr>
<tr>
<td>6</td>
<td>DILV, TGA, Arch hypoplasia</td>
<td>6</td>
<td>8</td>
<td>Stent</td>
<td>Waiting Fontan</td>
</tr>
<tr>
<td>7</td>
<td>HLHS</td>
<td>5</td>
<td>8</td>
<td>Stent</td>
<td>Sudden death</td>
</tr>
<tr>
<td>8</td>
<td>HLHS</td>
<td>8</td>
<td>8</td>
<td>Stent, Central PA reconstruction with homograft</td>
<td>Waiting Fontan</td>
</tr>
<tr>
<td>9</td>
<td>HLHS</td>
<td>4</td>
<td>8</td>
<td>Balloon</td>
<td>Waiting Fontan</td>
</tr>
<tr>
<td>10</td>
<td>HLHS</td>
<td>5</td>
<td>8</td>
<td>Stent</td>
<td>Waiting Fontan</td>
</tr>
</tbody>
</table>
Patent Graft in Central PA (N=2 of 10)

OP

Follow UP

Pt 4

Pt 9
Stenosed Graft in Central PA (N=8 of 10)

Pt 1

Pt 7
Graft Occlusion $\rightarrow$ Angioplasty, Stent $\rightarrow$ Stent Occlusion

1st Cath

2nd Cath
Graft Occlusion $\rightarrow$ Stent Occlusion $\rightarrow$ Graft Replacement with PA Homograft

Explanted graft
Diameter Change of CorMatrix Tube Graft for Central PA Reconstruction
### Interposition CorMatrix Tube Graft for Aortic Arch Repair for Interrupted Aortic Arch

<table>
<thead>
<tr>
<th>Patient</th>
<th>Diagnosis</th>
<th>Age at surgery</th>
<th>Surgery</th>
<th>Diameter of tube (mm)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IAA, AP window, VSD, ASD</td>
<td>6 day</td>
<td>Repair IAA/ AP window/VSD/ASD</td>
<td>12</td>
<td>No stenosis/dilatation</td>
</tr>
<tr>
<td>2</td>
<td>IAA, VSD, Dextrocardia, Hypoplastic right lung</td>
<td>16 day</td>
<td>Repair IAA/VSD</td>
<td>11</td>
<td>No stenosis/dilatation</td>
</tr>
<tr>
<td>3</td>
<td>IAA, VSD, Brain trauma with depressed skull fracture, s/p PDA stent/bilaterreal PAB</td>
<td>5 month</td>
<td>Repair IAA/VSD/ASD, Removal PDA stent/PA band</td>
<td>11</td>
<td>No stenosis/dilatation</td>
</tr>
</tbody>
</table>
Conclusion

While angioplasty using CorMatrix as an interposition tube vascular graft is feasible and safe in aorta, long follow up is required to assess the potential for growth of arterial conduit.

A high rate of occurrence of intimal hyperplasia formation with significant stenosis was found in reconstructed pulmonary arteries supplied by venous circulation. CorMatrix may not be the ideal material as a conduit in venous circulation to provide long-term durable outcomes.
Presentation Number: 99
Title: Preliminary experience in the use of an extracellular matrix (CorMatrix) as a tube graft: Word of caution
Session Name: Wednesday, April 29, 2015
Session Room: 612
Session Date: Congenital Heart Disease Simultaneous Scientific Session
Presentation Time: 8:45 AM - 8:56 AM
Presentation Format: You will have an 5 minute presentation followed by 6 minutes of discussion.
Discussant Name: David Morales