Transhepatic vascular access - a feasible and safe alternative for cardiac catheterization in children with congenital heart disease?

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Introduction
Cardiac catheterization in children with congenital heart disease is performed via femoral vascular access. In case this access isn’t available due to vessel thrombosis, indwelling central lines or patient’s small size, transhepatic approach seems a “viable” and safe alternative.

Methods

Results

<table>
<thead>
<tr>
<th>Patient</th>
<th>Nr. of Catheters</th>
<th>Body Weight</th>
<th>Congenital heart disease</th>
<th>Interventions</th>
<th>Sheath size</th>
<th>V. hepatica closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>A) 4.6kg B) 10.9kg</td>
<td>Right isomerism double inlet left ventricle with total anomalous pulmonary venous return</td>
<td>A) Closure of pulmonary artery (amplatzer vascular plug 10mm) B) Stenting superior caval vein (palmaz genesis 8x18mm)</td>
<td>4 french</td>
<td>yes (cook coil)</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>6.6kg</td>
<td>Pulmonary atresia ventricular septal defect</td>
<td>Stenting left and right pulmonary artery (palmaz blue stent 6x15mm and 7x15mm)</td>
<td>4 french</td>
<td>yes (cook coil)</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>A) 9.9kg B) 10kg</td>
<td>Ebstein’s anomaly, pulmonary valve stenosis</td>
<td>A) Coiling venovenous collatral (amplatzer vascular plug 6/8), ASD closure (ASO) B) Transseptal puncture, balloon dilatation left upper pulmonary vein</td>
<td>6 french</td>
<td>no</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>10kg</td>
<td>Double outlet right ventricle, hypoplastic left ventricle, obstruction right ventricular outflow tract</td>
<td>Diagnostic (no intervention)</td>
<td>4 french</td>
<td>no</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>18kg</td>
<td>Complete atioventricular septal defect, pulmonary stenosis</td>
<td>Stenting distal pulmonary artery (CP Stent 16mm)</td>
<td>11 french</td>
<td>yes (amplatzer vascular plug)</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>32kg</td>
<td>Atrial septal defect, secundum type</td>
<td>ASD-Closure (amplatzer septal occluder 12mm)</td>
<td>7 french</td>
<td>no</td>
</tr>
</tbody>
</table>

- Eight cardiac catheterizations in 6 children during 11 year period.
- Median age 18.5 months (range 2-174 months), median weight 10kg (range 4.6-18kg).
- Sheath size ranged 4-11Fr.
- Transhepatic puncture was ultrasound guided.
- After 3 interventions the punctured hepatic vein was closed with a device.
- In all patients post interventional abdominal ultrasound, transthoracic echocardiography and ECG didn’t reveal any complications, especially no intra abdominal bleeding.

Conclusion
- Broad spectrum of interventional cardiac catheter is possible via transhepatic vascular access.
- Transhepatic vascular access is feasible and safe alternative for cardiac catheterization, if routine femoral or jugular access is not possible.
- CAVE: active liver disease, abnormal hepatic drainage.

References