Coronary Artery Anatomy in neonates with Transposition of the Great Arteries undergoing the Arterial Switch Procedure – Comparison of preoperative trans-thoracic echocardiography and intra-operative findings.

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Objective:
This study compares the pattern of coronary artery anatomy in Transposition of the Great Arteries (TGA) using 2D trans-thoracic echocardiography (TTE) with intra-operative findings during arterial switch procedure.

Methods:
Single centre retrospective review of 213 children with TGA and underwent the arterial switch operation from January 2001 to December 2012.

Results:
213 patients underwent neonatal arterial switch procedure from January 2001 to December 2012. The male: female ratio was found to be 3:1. 96% patients had documented coronary artery (CA) anatomy delineated by TTE preoperatively (9 cases did not have documented echo findings describing CA anatomy). 165 cases (81%) showed correlation between pre-operative TTE and intra-operative CA anatomy patterns. However, in 39 cases (19%) there was no correlation. Table 1 shows the overall comparison between the 2 groups. Where there was an abnormal CA pattern this was only detected in 21 cases (37%) prior to the arterial switch procedure. The most common abnormal CA variant found was that with left anterior descending artery (LAD) arising from anterior facing sinus (sinus 1) while right coronary artery (RCA) arising from posterior facing sinus (sinus 2) dividing further into main and circumflex branches. 14 cases had a single CA ostium giving rise to both the left and right coronaries. The remainder of abnormal patterns was composite of all coronary artery variations previously described, making a total of 57 cases with abnormal CA anatomy.

<table>
<thead>
<tr>
<th>Surgical intraoperative CA findings</th>
<th>ECHO Normal CA anatomy*</th>
<th>ECHO Abnormal CA anatomy^</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>144</td>
<td>3</td>
<td>147</td>
</tr>
<tr>
<td>Abnormal</td>
<td>36</td>
<td>21</td>
<td>57</td>
</tr>
<tr>
<td>Total</td>
<td>180</td>
<td>24</td>
<td>204</td>
</tr>
</tbody>
</table>

Table 1: Comparison between preoperative echocardiography and intra-operative CA findings.

* LAD & Circumflex arising from sinus 1 and RCA arising from sinus 2
^ Any variation from normal CA anatomy defined

Conclusion:
In conclusion, there was good correlation between pre-operative echocardiography and intra-operative findings when the coronary artery anatomy was found to be normal. With abnormal coronary anatomy a mismatch was found between the two modalities. However, this had no bearing on eventual outcome following the arterial switch procedure.