Hybrid therapy of anti-tachycardia pacing and catheter ablation of supraventricular tachycardia for patients with complex congenital heart disease

Tokyo Women’s Medical University, Japan
Toyohara K, Kumamaru T, Kudo Y, Takeuchi D, Shoda M

Background
Device therapy of bradycardia may be required for patients with congenital heart disease (CHD) after surgery. Additionally, such patients may have complicated substrates of supraventricular tachycardia (SVT) resistant to antiarrhythmic drugs and catheter ablation (CA).

Objectives
The aim of this study is to evaluate the clinical outcomes of hybrid therapy with anti-tachycardia pacing (ATP) and CA for SVT in patients with complex CHD.

Study
Retrospective study

Patients
25 CHD patients with refractory SVT

<table>
<thead>
<tr>
<th>Patients</th>
<th>25 CHD patients with refractory SVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TA</td>
<td>7</td>
</tr>
<tr>
<td>TOF</td>
<td>3</td>
</tr>
<tr>
<td>dTGA</td>
<td>3</td>
</tr>
<tr>
<td>ccTGA</td>
<td>3</td>
</tr>
<tr>
<td>Congenital MS</td>
<td>2</td>
</tr>
<tr>
<td>SLV</td>
<td>2</td>
</tr>
<tr>
<td>Ebstein</td>
<td>1</td>
</tr>
<tr>
<td>Bicuspid PAA</td>
<td>1</td>
</tr>
<tr>
<td>CCH</td>
<td>1</td>
</tr>
<tr>
<td>Asplenia</td>
<td>1</td>
</tr>
<tr>
<td>AVSD</td>
<td>1</td>
</tr>
<tr>
<td>Polysplenia</td>
<td>1</td>
</tr>
</tbody>
</table>

following
- Cardiac surgery
- Two-ventricular repair 8
- Febrtial pahilation 12
- Atrial switch operation 3

Palliative procedure 2
- RF catheter ablation
- Pacemaker or ICD implantation

DDD 12
ICD 2
CRT-P 1
CRT-D 1

(All devices were Medtronic with atrial ATP programmability)

Results of RF catheter ablation
- Target SVTs
  - AVRT around 2AVNs as AP 1
  - AVNRT-IART 1
  - AP 3
  - AFL-IART 2
  - AFL+multiple IARTs 1
  - AFL+AF 2
  - Multiple IARTs 12
  - Multiple IARTs+AF 3

- Acute success 60% (15/25 patients)
  (Definition of acute success: no inducible SVT)
- Recurrence of SVT 60% (9/15 patients during the average FU of 24 months)

Results of atrial ATP
- No atrial ATP
  - Long-term successful RF ablation 6
  - Acute failed RF ablation without recurrent SVT 3
  - Recurrent SVT with 1:1 AV conduction 6
- Appropriate atrial ATP
  - Recurrent atrial ATP 10
- Inappropriate atrial ATP


Conclusions
Although CA was not always successful for complex CHD, an automatic atrial ATP option showed effective additional treatment for refractory SVT. Further blush-up of the ATP programming should be required.