Abstract: P5702

Non-invasive epicardial and endocardial mapping in patients with idiopathic right ventricular outflow tract premature ventricular contractions: new insights into arrhythmia substrate

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Topic(s):
Arrhythmias, General – Diagnostic Methods: Non-invasive Diagnostic Methods

Citation:

Background: It has been accepted for years that idiopathic premature ventricular contractions (PVCs) with origin in the right ventricular outflow tract (RVOT) are benign. They are thought to result from triggered activity and most studies do not describe abnormal findings during electroanatomical mapping.

Dispersion of ventricular repolarization is associated with the susceptibility to ventricular arrhythmias and may indicate the presence of diseased myocardium. The activation recovery interval (ARI) has been used as a surrogate measure of ventricular action potential duration and refractory period.

Purpose: The aim of this study was to use the new non-invasive epicardial and endocardial mapping system (NEES) to study patients with RVOT PVCs in order to evaluate the ARI in the epicardium of RVOT during sinus rhythm (SR).

Methods: Non-invasive mapping was performed with the NEES, based on body surface electrocardiograms of a maximum of 224 electrodes and computed tomography imaging data. Unipolar electrograms were reconstructed on the epicardial and endocardial surfaces. Patients were excluded if they had structural heart disease, previous ablation or conduction abnormalities. ARI was defined as the interval between times of minimum derivative of the QRS and the maximum derivative of the T wave in the unipolar electrograms. We evaluated the ARI map in patients with RVOT PVCs and in a control group of patients without PVCs (Figure). We assessed the maximum value of ARI (Max ARI), the minimum value of ARI (Min ARI) and the difference between the Max ARI and the Min ARI (Diff ARI).

Results: We studied 8 patients with RVOT PVCs and 8 patients without PVCs.

The results are presented in the table.

Conclusion: In this group of patients we found a significantly higher dispersion of the ARI measurements through the epicardium of the RVOT in patients with PVCs in comparison with patients without PVCs.

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>RVOT PVCs (n= 8)</th>
<th>Control (n=8)</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years, median (IQR)</td>
<td>53 (48-65)</td>
<td>59 (52-67)</td>
<td>0.536</td>
</tr>
<tr>
<td>Male gender, n (%)</td>
<td>4 (50)</td>
<td>6 (75)</td>
<td>0.608</td>
</tr>
<tr>
<td>NEES data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max ARI in msec, median (IQR)</td>
<td>285 (236-331)</td>
<td>228 (197-298)</td>
<td>0.195</td>
</tr>
<tr>
<td>Min ARI in msec, median (IQR)</td>
<td>176 (138-192)</td>
<td>216 (185-255)</td>
<td>0.161</td>
</tr>
<tr>
<td>ARI diff in msec, median (IQR)</td>
<td>111 (83-147)</td>
<td>15 (4-34)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
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