Declaration of conflict of interest

NONE
Transatlantic Electrophysiology Lessons for and from Iberoamerica

European Society of Cardiology
Mexican Society of Cardiology
Wolff-Parkinson-White Syndrome in Ebstein’s Anomaly
is Everything said?
The abnormal development of the tricuspid valve in patients with Ebstein´s anomaly results in several activation abnormalities including delayed intraatrial conduction, right bundle branch block (RBBB) in 75-95% and ventricular preexcitation in 5-25% of the population.
The electrocardiogram in Ebstein’s anomaly
Sodi Pallares D, Arch Inst Cardiol Mex, 1955;25:17-34
Electrocardiographic characteristics of patients with Ebstein’s anomaly before and after ablation of an atrioventricular pathway.

The present study reports our experience in 226 consecutive patients with Ebstein’s anomaly who were seen at Instituto Nacional de Cardiologia “Ignacio Chávez” in México City from January 1985 to November 2005.

The purpose of this study was to analyze, in a large series of patients with Ebstein’s anomaly, the electrocardiogram in sinus rhythm before and after AP ablation.
One accessory pathway
Successful ablation
n=33 (51%)
Study Group
GROUP A

Ebstein’s anomaly
(n=226)

Exclusion
n=31 (49 %)

Without Tachycardia
n=162 (72%)

Control Group
n=30
GROUP B

Multiple AP
n=13 (20 %)

Unsuccessful Ablation
n=12 (18 %)

Concealed AP
n=5 (8%)

Left AP
n=1 (1.5%)

Another AP
n=11

Mahaim Fibers
n=2
TABLE 2
Clinical and ECG Characteristics of Patients with and without SVT

<table>
<thead>
<tr>
<th></th>
<th>(A) Study Group (Before Ablation) (N = 33)</th>
<th>(B) Control Group (N = 30)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>22 ± 13</td>
<td>23 ± 16</td>
<td>NS</td>
</tr>
<tr>
<td>Female</td>
<td>18 (55%)</td>
<td>18 (60%)</td>
<td>NS</td>
</tr>
<tr>
<td>PR interval (msec)</td>
<td>108 ± 12</td>
<td>197 ± 31</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>QRS axis (degrees)</td>
<td>−25 ± 13</td>
<td>86 ± 36</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>QRS (msec)</td>
<td>113 ± 22</td>
<td>131 ± 18</td>
<td>0.002</td>
</tr>
<tr>
<td>RBBB</td>
<td>None</td>
<td>28 (92%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Grade</td>
<td>Study Group (N = 33)</td>
<td>Control Group (N = 30)</td>
<td>P Value</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------</td>
<td>------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Grade I</td>
<td>18</td>
<td>15</td>
<td>NS</td>
</tr>
<tr>
<td>Grade II</td>
<td>11</td>
<td>10</td>
<td>NS</td>
</tr>
<tr>
<td>Grade III</td>
<td>4</td>
<td>5</td>
<td>NS</td>
</tr>
</tbody>
</table>

Grade I = mild; grade II = moderate; grade III = severe.
GROUP A
33 PATIENTS

21/33 (62%) had a typical ECG pattern of WPW
None of the patients had RBBB

27/33 (82%) developed RBBB during orthodromic AVRT

After-ablation RBBB pattern appeared in 31/33 patients (94%)

GROUP B
28/30 (93%) with RBBB pattern

RESULTS

Ebstein’s Anomaly (n=226)

EPS n=64 (28%)

Without Tachycardia n=162 (72%)
Accessory Pathway Locations

Mitral Valve

- One Session: 20 (61%)
- Two Sessions: 9 (27%)
- Three Sessions: 4 (12%)

His bundle

Tricuspid Valve

- One Session: 20 (61%)
- Two Sessions: 9 (27%)
- Three Sessions: 4 (12%)

Accessory Pathway Locations:

- Anterior
- Posterior
- Right
- Left
<table>
<thead>
<tr>
<th>I</th>
<th>aVR</th>
<th>V1</th>
<th>V4</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>aVL</td>
<td>V2</td>
<td>V5</td>
</tr>
<tr>
<td>III</td>
<td>aVF</td>
<td>V3</td>
<td>V6</td>
</tr>
<tr>
<td>II</td>
<td></td>
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</table>

INSTITUTO NACIONAL DE CARDIOLOGIA

ECG BASAL
<table>
<thead>
<tr>
<th></th>
<th>A: Before Ablation</th>
<th>B: Orthodromic Tachycardia</th>
<th>C: After Ablation</th>
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<tr>
<td>I</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
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<tr>
<td>II</td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
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<tr>
<td>III</td>
<td><img src="image7.png" alt="Image" /></td>
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<tr>
<td>aVL</td>
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<td><img src="image18.png" alt="Image" /></td>
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<tr>
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<tr>
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<tr>
<td>V3</td>
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<tr>
<td>V4</td>
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<td><img src="image30.png" alt="Image" /></td>
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<tr>
<td>V5</td>
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<td><img src="image32.png" alt="Image" /></td>
<td><img src="image33.png" alt="Image" /></td>
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<tr>
<td>V6</td>
<td><img src="image34.png" alt="Image" /></td>
<td><img src="image35.png" alt="Image" /></td>
<td><img src="image36.png" alt="Image" /></td>
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</tbody>
</table>
None of the patients in the study group had an ECG pattern of RBBB during sinus rhythm. In contrast 28/30 (93%) patients in the control group had RBBB (P<0.001).

Right bundle branch block appeared in 31/33 (94%) of the study group after successful catheter ablation.
A

Ebstein's Anomaly before ablation with preexcitation

B

Ebstein's Anomaly after ablation without preexcitation
Results

The absence of RBBB in patients with Ebstein´s anomaly and recurrent tachycardia had 98% sensitivity and 92% specificity for the diagnosis of an AP. The positive predictive value was 91% (0.77,0.97 CI 95%) and the negative predictive value was 98% (0.85,0.99 CI 95%)
Clinical implications

In patients with Ebstein´s anomaly and supraventricular tachycardia, the absence of RBBB in sinus rhythm is a highly sensitive and specific indicator of the presence of an ipsilateral accessory pathway.

Radiofrequency Catheter Ablation of Accessory Atrioventricular Pathways in Ebstein’s Anomaly

The localization of AP may be impeded by the presence of multiple accessory pathways (6-36%) and by abnormal local electrograms recorded along the atrialized right ventricle.
Baseline 12-lead ECG
Final 12-lead ECG after ablation
Left, Fluoroscopic views (top panel, 30° right anterior oblique; bottom panel, 30° left anterior oblique) illustrate right coronary artery (RCA) mapping to guide positioning of the endocardial catheter (MAP) in a patient with Ebstein’s anomaly and a manifest right posterior AP.


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Tomohiko A et al. PACE 2002;25:374-375
Conclusions

In patients with Ebstein’s anomaly, RF catheter ablation represents a therapeutic option to cure atrioventricular tachycardias on the basis of an accessory atrioventricular connection.

In this subset of patients, the success rate is lower (75-80%) and the recurrence higher (20-25%) than in the general population.
Conclusions

Our finding demonstrate that the absence of RBBB in patients with Ebstein’s anomaly is a sensitive and specific marker for the presence of an accessory pathways.