Premature Failure of a Riata Defibrillator Lead Without Impedance Change or Inappropriate Sensing: A Case Report and Review of the Literature

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Introduction

• Advancements have been made in the composition of lead materials

• Insulation defects remain as the most common cause of lead failures

• Clinical presentation of failure is often secondary to impedance changes or inappropriate sensing and ICD therapy
Case

- A 63 year old woman with HTN, LBBB and nonischemic cardiomyopathy

- Uneventful implantation of a St. Jude Medical biventricular ICD with a Riata 1570 right ventricular lead

- Post operative evaluation revealed stable device parameters
Follow Up

- Patient presents with symptoms described as hiccups
- Device interrogation performed
- ECHO performed
Procedural Findings

- Fluoroscopic evaluation prior to the procedure
- Radio-opaque wire visualized outside main body of lead
- RV lead evaluated with pace-sense analyzer
Procedural Findings (cont’d)

• RV lead extracted with straightforward manual traction

• Examination revealed a significant split in the insulation allowing the inner wire to protrude
<table>
<thead>
<tr>
<th>Publication</th>
<th>Lead Model #</th>
<th># of Pre-existing Leads</th>
<th>Location of Fracture</th>
<th>Time from Implant that Fracture was Identified</th>
<th>Clinic Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richards Europace 2010</td>
<td>Riata 1582</td>
<td>None</td>
<td>Proximal to the defibrillation coil in the Right Atrium</td>
<td>44 Months</td>
<td>Increased Pacing Threshold and Increased Lead Impedance</td>
</tr>
<tr>
<td>Richards Europace 2010</td>
<td>Riata 1582</td>
<td>None</td>
<td>Proximal to the defibrillation coil in the Right Atrium</td>
<td>63 Months</td>
<td>Noise Oversensing – Stable Lead Parameters</td>
</tr>
<tr>
<td>Duray Heart Rhythm 2008</td>
<td>Riata 1580</td>
<td>None</td>
<td>At the level of the Tricuspid Valve</td>
<td>Not Available</td>
<td>Shocks secondary to artifact – Stable Lead Parameters</td>
</tr>
<tr>
<td>Jalal Heart Rhythm 2010</td>
<td>Riata 1582</td>
<td>None</td>
<td>Proximal to Right Ventricular Coil – Site of heel curve in inferior right atrium</td>
<td>Two Years</td>
<td>Irregular Non-physiological signals</td>
</tr>
</tbody>
</table>
• Failure mechanism remains unclear

• Small diameter leads with insulation composed purely of silicone may be more susceptible to failure
Discussion

• Defibrillator lead failures continue to occur

• Similar cases have been previously reported

• Follow Up of patients with Riata Leads

• Heightened awareness of patients with implanted small diameter leads having outer insulation composed purely of silicone
Thank you!

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