Relationship between cardiac implantable electronic device and atrial tachyarrhythmia recurrence after atrial fibrillation ablation

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Background

- **AF ablation success** (HRS’ consensus document 5)
  - freedom from AF, AFL, AT $\geq$ 30sec. without AADs
  - one year success: blanking period end $\sim$ 12mo.
  - long-term success: blanking period end $\sim$ 36mo.

- **AF recurrence rate** after ablation: 20~40%
Silent AF (SAF) : asymptomatic AF, incidentally diagnosed

- Real incidence not known
- (Almost) same increased risk of ischemic stroke

Monitoring devices

- EKG
- Holter : 24 hour, 7 or 30 days
- Event monitor, Patch device
- Implantable loop recorder
- CIED (already implanted)
Methods - inclusion

- Single center retrospective study
- Seoul St. Mary’s hospital
- April, 2009 ~ December, 2015
- AF pt. s/p RFCA
- Medical records up to 3yrs after ablation
- Analysis btw pt. with CIED (atrial lead) and without CIED
Methods – primary end point

- **Primary end point**: recurrence of atrial tachyarrhythmia
  - not including blanking period (3 mo. after ablation)
  - AF, AFL, AT
  - EKG, holter, device programming
    - ✓ Medtronic: count atrial event in R-R interval ≥32
    - ✓ St. Jude: FARI >170/sec
    - ✓ Boston: >170/sec for 8 atrial beats
    - ✓ Biotronik: >170/sec >5 of 8 beats
### Baseline Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Patients without CIEDs (n=704)</th>
<th>Patients with CIEDs (n=53)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>59.5</td>
<td>66.6</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Female, % (n)</td>
<td>29.1 (205)</td>
<td>52.8 (28)</td>
<td>0.01</td>
</tr>
<tr>
<td>PeAF, % (n)</td>
<td>46.5 (381)</td>
<td>50.9 (27)</td>
<td>0.64</td>
</tr>
<tr>
<td>CHA2DS2-VASc score</td>
<td>1.69</td>
<td>2.53</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>CHF, % (n)</td>
<td>3.8 (27)</td>
<td>3.8 (2)</td>
<td>1.00</td>
</tr>
<tr>
<td>Hypertension, % (n)</td>
<td>49.9 (351)</td>
<td>60.4 (32)</td>
<td>0.15</td>
</tr>
<tr>
<td>Diabetes Mellitus, % (n)</td>
<td>15.6 (110)</td>
<td>20.8 (11)</td>
<td>0.33</td>
</tr>
<tr>
<td>Stroke/TIA, % (n)</td>
<td>9.1 (64)</td>
<td>11.3 (6)</td>
<td>0.62</td>
</tr>
<tr>
<td>CAD/PAD, % (n)</td>
<td>7.8 (55)</td>
<td>9.4 (5)</td>
<td>0.60</td>
</tr>
<tr>
<td>LA size, mm</td>
<td>42.7</td>
<td>44.7</td>
<td>0.25</td>
</tr>
<tr>
<td>AADs</td>
<td>51.3 (388)</td>
<td>58.5 (31)</td>
<td>0.67</td>
</tr>
</tbody>
</table>

## Primary end point

### Recurrence of atrial tachyarrhythmia

<table>
<thead>
<tr>
<th>Characteristics</th>
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<th>Patients with CIEDs (n=53)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT/AF, % (n)</td>
<td>28.3 (199)</td>
<td>49.1 (26)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>AT, AFL % (n)</td>
<td>43.2 (86)</td>
<td>11.5 (3)</td>
<td></td>
</tr>
<tr>
<td>AF</td>
<td>56.8 (113)</td>
<td>88.5 (23)</td>
<td></td>
</tr>
<tr>
<td>AT/AF, % (n)*</td>
<td></td>
<td></td>
<td>0.07</td>
</tr>
</tbody>
</table>

AT: atrial tachycadia, AF: atrial fibrillation, AFL: atrial flutter

* partial correlation
Kaplan-Meier curve

p < 0.05
Conclusion

- **AF patients with CIED who were ablated** were more likely to be aged, woman, have higher CHA2DS2-VASc score and tachyarrhythmia recurrence than AF patients without CIED.

- But, we were not able to prove the direct relationship between CIED and AF recurrence.
Thank you for listening!
Methods - protocol

- Ablation
  - NavX Ensite map, CoolFlex cathether
  - PVI, (CTI) -&gt; induction -&gt; stepwise approach

- Follow up
  - EKG : every 3mo.
  - Holter : 2, 6, 12, 24, 36 mo.
  - Device programming : every 6mo.
Factors associated with AF recurrence after ablation

- AF type and duration: LSPeAF > PeAF > PAF
- Cardiac structural changes: LA dilatation, HCMP, Valvular heart disease
- Clinical features: HTN, Obesity, OSA, Thyroid disease, Hypercholesterolemia, DM, CKD
- Early recurrence of AF (ERAF): recurrence within 3mo. (blanking period)
- Ablation time, LAA emptying velocity