Relationship between pre-procedural non-ischemic ST-segment depression and the clinical outcomes after catheter ablation in persistent atrial fibrillation patients

M. Yano¹, Y. Egami¹, S. Kawanami¹, H. Sugae¹, K. Ukita¹, A. Kawamura¹, H. Nakamura¹, K. Yasumoto¹, M. Tsuda¹, N. Okamoto¹, Y. Matsunaga-Lee¹, M. Nishino¹, J. Tanouchi¹

¹Osaka Rosai Hospital, Sakai, Japan

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Background: ST-segment depression suggests the presence of coronary artery disease (CAD) during sinus rhythm, but the clinical significance, including the outcomes after catheter ablation (CA) in atrial fibrillation (AF) patients remains unknown.

Purpose: The aim of this study was to investigate the relationship between non-ischemic ST-segment depression during AF rhythm before CA and late arrhythmia recurrence in persistent AF (PerAF) patients.

Methods: The present study included PerAF patients from the Osaka Rosai Atrial Fibrillation ablation (ORAF) registry who underwent an initial ablation and had no history of CAD. We assigned the patients based on the presence of ST-segment depression before CA and evaluated the impact of relevant factors on ST-segment depression before CA and the relationship between ST-segment depression, including leads locations (anterior leads, inferior leads, and lateral leads) or depression type (upsloping, horizontal and downsloping) or the degree of ST-segment depression and late recurrence of AF (LRAF).

Results: This study population included a total of 551 patients of which 189 had ST-segment depression. The median follow-up duration was 397 days and LRAF occurred in 195 patients. By multiple regression analysis, diabetes mellitus, hemoglobin, brain natriuretic peptide, left ventricular ejection fraction and left atrial diameter were significant determinants of ST-segment depression before CA. Kaplan-Meier analysis demonstrated that the patients with ST-segment depression had a significantly greater risk of LRAF than those without (p<0.001). Multivariate Cox proportional hazards analysis showed ST-segment depression was independently and significantly associated with a higher risk of LRAF (p<0.001). The patients with ST-segment depression \( \geq 0.15 \text{mV} \) had a significantly higher risk of LRAF than those with ST-segment depression \( \geq 0.15 \text{mV} \) (p<0.001). No significant differences among the ST-segment depression leads locations and ST-segment depression type were observed.

Conclusion: Non-ischemic ST-segment depression during AF rhythm was significantly associated with LRAF post CA in PerAF patients.
Free of late recurrence

% 100 80 60 40 20 0

Number at risk

<table>
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<th></th>
<th>0</th>
<th>200</th>
<th>400</th>
<th>600</th>
<th>800</th>
<th>1000</th>
<th>1200</th>
<th>1400</th>
<th>1600</th>
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</thead>
<tbody>
<tr>
<td>ST depression &lt;0.15mV</td>
<td>117</td>
<td>79</td>
<td>57</td>
<td>51</td>
<td>35</td>
<td>30</td>
<td>20</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>ST depression ≥0.15mV</td>
<td>72</td>
<td>42</td>
<td>20</td>
<td>15</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td>3</td>
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</tr>
</tbody>
</table>

Log rank p<0.001

ST depression <0.15mV

ST depression (≥) ≥0.15mV