CONTACT FORCE TECHNOLOGY OFFERS GREATER BENEFITS IN PERSISTENT COMPARED WITH PAROXYSMAL ATRIAL FIBRILLATION CATHETER ABLATION: 1 YEAR FOLLOW UP

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Contact force sensing technology identifies sites of inadequate contact and reduces acute pulmonary vein reconnection: A prospective case control study

EFFICAS II: optimization of catheter contact force improves outcome of pulmonary vein isolation for paroxysmal atrial fibrillation

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Paroxysmal AF Catheter Ablation With a Contact Force Sensing Catheter

Results of the Prospective, Multicenter SMART-AF Trial

Andrea Natale, MD,* Vivek Y. Reddy, MD,# George Monir, MD,** David J. Wilber, MD,†† Bruce D. Lindsay, MD,†† H. Thomas McElderry, MD,§§ Charan Kantipudi, MD,¶¶ Moussa C. Mansour, MD,§§ Daniel P. Melby, MD,## Douglas L. Packer, MD,*** Hiroshi Nakagawa, MD,¶¶ Baohui Zhang, MS, SM,¶¶ Robert B. Stagg, PhD,¶¶ Lee Ming Boo, PhD,¶¶ Francis E. Marchlinski, MD§§
BACKGROUND

TOCCASTAR STUDY

OPTIMAL CF: > 90% ABLATIONS WITH >10 G

Circulation 2015; 132: 907-915
BACKGROUND

STAR AF 2 Trial

Background

Optimizing Radiofrequency Ablation of Paroxysmal and Persistent Atrial Fibrillation by Direct Catheter Force Measurement—A Case-Matched Comparison in 198 Patients

Elisabeth Sigmund, M.D., Helmut Puerrerfellner, M.D., Michael Derndorfer, M.D., Georgios Kollias, M.D., Siegmund Winter, M.D., Josef Aichinger, M.D., Hans-Joachim Nesser, M.D., and Martin Martinek, M.D.

Only PAF:
Outcome at 12 months: 76.9% vs 84% (p 0.368)

Only PeAF:
Outcome at 12 months: 51.4% vs 75.7% (p 0.032)

(PACE 2015; 38:201–208)
AIMS OF THE STUDY

COMPARING CF VS NON CF FORCE IN PAROXYSMAL AND PERSISTENT AF ABLATIONS

✓ Procedure, Radiofrequency and Fluoroscopy time
✓ Safety
✓ Efficacy at 12 months follow up in particular in PeAF
DESIGN OF THE STUDY

From January 2011 to March 2014

260 FIRST PROCEDURES

165 PAROXYSMAL
95 PERSISTENT

102 CONTACT
158 NON CONTACT

From January 2012

80 Smart Touch
22 Tacticath

Exclusion Criteria
- Redo
- Long standing AF
METHODS

ABLATION PROTOCOL

(EAM)

PAROXYSMAL AF → PVI

PERSISTENT AF → PVI + LEFT ATRIAL LINES

✓ CF 5-15 g (up to 40 g)
✓ Entrance and exit block 30 minutes from the vein isolation
✓ Activation map for linear ablation validation
✓ Adenosine test
FOLLOW UP: 23 ± 11 months

Methods:

- Clinical and EKG
- 24 h Holter / ICM
- OAC withdraw based on CHA₂DS₂VASC

At 3 M:
- Clinical and EKG
- 24 h Holter / ICM

At 6 M:
- Clinical and EKG
- 24 h Holter / ICM

At 12 M:
- Clinical and EKG
- 24 h Holter / ICM
- AAD withdraw based on symptoms
## RESULTS

<table>
<thead>
<tr>
<th>Baseline Characteristics</th>
<th>non contact</th>
<th>contact</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years±DS)</strong></td>
<td>62.30 ± 11.0</td>
<td>60.2 ± 10.1</td>
<td>0.100</td>
</tr>
<tr>
<td>Males, n (%)</td>
<td>105 (68.6)</td>
<td>88 (71.5)</td>
<td>0.545</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>93 (60.8)</td>
<td>68 (55.3)</td>
<td>0.436</td>
</tr>
<tr>
<td>Diabetes, n (%)</td>
<td>8 (5.2)</td>
<td>9 (7.3)</td>
<td>0.454</td>
</tr>
<tr>
<td>Previous stroke or TIA, n (%)</td>
<td>4 (2.6)</td>
<td>8 (6.5)</td>
<td>0.116</td>
</tr>
<tr>
<td>CAD, n (%)</td>
<td>11 (7.2)</td>
<td>6 (4.8)</td>
<td>0.435</td>
</tr>
<tr>
<td><strong>AF Type</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paroxysmal, n (%)</td>
<td>98 (64.0)</td>
<td>76 (61.8)</td>
<td>0.460</td>
</tr>
<tr>
<td>Persistent, n (%)</td>
<td>56 (36.6)</td>
<td>47 (38.2)</td>
<td>0.459</td>
</tr>
<tr>
<td><strong>EF (% ± DS)</strong></td>
<td>58.7 ± 4.7</td>
<td>58.3 ± 4.9</td>
<td>0.430</td>
</tr>
<tr>
<td>AF lasting (months±DS)</td>
<td>23.11 ± 3.2</td>
<td>21.1 ± 2.5</td>
<td>0.650</td>
</tr>
</tbody>
</table>
RESULTS

SIMILAR NUMBER OF COMPLICATIONS

<table>
<thead>
<tr>
<th>Procedure</th>
<th>RF</th>
<th>Fluoroscopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No CF</td>
<td>CF</td>
<td></td>
</tr>
</tbody>
</table>

Time (min)
RESULTS

Kaplan Meier Curve

AF free survival

Follow up - months

Contact
Non Contact

Blanking period

Log Rank Test $P=0.052$

84.6% vs 75.7%
RESULTS

Kaplan Meier Curves

**Non CF GROUP**

- AF free survival
- Follow up - months

- Log Rank P=0.04

**CF GROUP**

- AF free survival
- Follow up - months

- Log Rank P=0.27

HR 0.24 [0.10-0.58], 95% CI

HR 0.55 [0.18-1.68], 95% CI
RESULTS

Kaplan Meier Curve

AF free survival

Follow up - months

PAF and CF

PAF and No CF

PeAF and CF

PeAF and No CF

NS

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LIMITATIONS OF THE STUDY

- Non randomized single centre study
- Success rate on/off AAD
- Different CF sensing catheter designs
- Not reliable AF monitoring systems
- No target CF/FTI values
✓ CONTACT FORCE IS ASSOCIATED WITH SHORTER PROCEDURES, RADIOFREQUENCY AND FLUOROSCOPY WITH SIMILAR SAFETY

✓ CF IMPACTS ABLATION OUTCOME IN MIXED COHORT OF PAF AND PeAF WITH LOWER RATE OF RECURRENCE AFTER 12 MONTHS
CONCLUSIONS 2

✓ EFFICACY OF CF IS LESS EVIDENT IN PAF COMPARED WITH PeAF

✓ IN PeAF LEFT ATRIAL LINES ON TOP OF PVI MAY BE BENEFICIAL WHEN PERFORMED WITH CONTACT FORCE SENSING CATHETERS

✓ FURTHER RANDOMIZED TRIALS ARE NEEDED IN PeAF AND CF: STAR AF 2 TRIAL ABLATIONS WERE PERFORMED WITHOUT CONTACT FORCE AND LESS THAN 50% OF LEFT LINES WERE COMPLETE.
THANK YOU

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