

**Effect of Empirical Left Atrial Appendage Isolation on long-term procedure outcome in patients with Long-Standing Persistent AF undergoing Catheter Ablation: Results from the BELIEF Randomized Trial**

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**ClinicalTrials.gov Identifier: NCT01362738**

**Luigi Di Biase, J. David Burkhardt, MD, Prasant Mohanty, Sanghamitra Mohanty, Javier E. Sanchez, Chintan Trivedi, Mahmut Güneş, Yalçın Gököğlan, Carola Gianni, Rodney P. Horton, G. Joseph Gallinghouse, Shane Bailey, Jason D. Zagrodzky, Steven C. Hao, Richard H. Hongo, Salwa Beheiry, Pasquale Santangeli, Michela Casella, Antonio Dello Russo, Amin Al-Ahmad, Patrick Hranitzky, Dhanujaya R. Lakkireddy, Claudio Tondo, **Andrea Natale.****

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**DISCLOSURES**

I am a consultant for

- ✓ Biosense Webster
- ✓ Stereotaxis
- ✓ St Jude Medical

I received speaker honoraria/travel from

- ✓ Atricure
- ✓ Biotronik
- ✓ Boston Scientific
- ✓ Medtronic

**BACKGROUND**

Long standing persistent (LSP) atrial fibrillation (AF) is the most challenging type of AF to treat with catheter ablation.

**BACKGROUND**

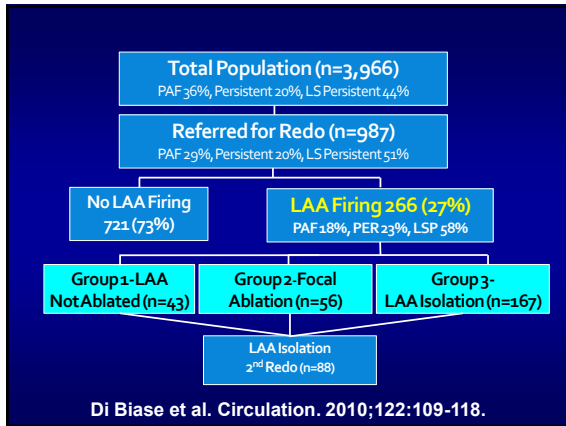
- Several studies have shown that in addition to pulmonary vein (PVs) isolation other non PVs areas may be the source of initiation and maintenance of atrial fibrillation in patients.
- The most common sites are: the superior vena cava, the ligament of Marshall, the coronary sinus, the crista terminalis, the left atrial posterior wall and the left atrial appendage.

**Circulation**  
 JOURNAL OF THE AMERICAN HEART ASSOCIATION

**American Heart Association**

**Left Atrial Appendage : An Underrecognized Trigger Site of Atrial Fibrillation**  
 Luigi Di Biase, J. David Burkhardt, Prasant Mohanty, Javier Sanchez, Sanghamitra Mohanty, Rodney Horton, G. Joseph Gallinghouse, Shane M. Bailey, Jason D. Zagrodzky, Pasquale Santangeli, Steven Hao, Richard Hongo, Salwa Beheiry, Sakis Themistoclakis, Aldo Bonso, Antonio Rossillo, Andrea Corrado, Antonio Raviele, Amin Al-Ahmad, Paul Wang, Jennifer E. Cummings, Robert A. Schweikert, Gemma Pelargonio, Antonio Dello Russo, Michela Casella, Pietro Santarelli, William R. Lewis and Andrea Natale

**Di Biase et al. Circulation. 2010;122:109-118.**



### EVIDENCE of the LAA as a TRIGGER for AF/AT

**Localized reentry within the left atrial appendage: arrhythmogenic role in patients undergoing ablation of persistent atrial fibrillation**

Mélieze Hocini, MD, Ashok J. Shah, MD, Isabelle Nault, MD, Prashanthan Sanders, MBBS, PhD, Matthew Wright, MBBS, PhD, Sanjiv M. Narayan, MD, FACC, Yoshihide Takahashi, MD, Pierre Jais, MD, Satoshi Matsuo, MD, Sébastien Knecht, MD, Frédéric Sacher, MD, Kang-Teng Lin, MD, Jacques Clémenty, MD, Michel Haissaguerre, MD

**Management of focal atrial tachycardias originating from the atrial appendage with the combination of radiofrequency catheter ablation and minimally invasive atrial appendectomy**

Kiao-gang Guo, MD, Jin-lin Zhang, MD, Jian Ma, MD, Yu-he Jia, MD, Zhe Zheng, MD, Hongyue Wang, MD, Xi Su, MD, Shu Zhang, MD, FRCGS

**Left Atrial Appendage Ligation and Ablation for Persistent Atrial Fibrillation**  
The LAALA-AF Registry

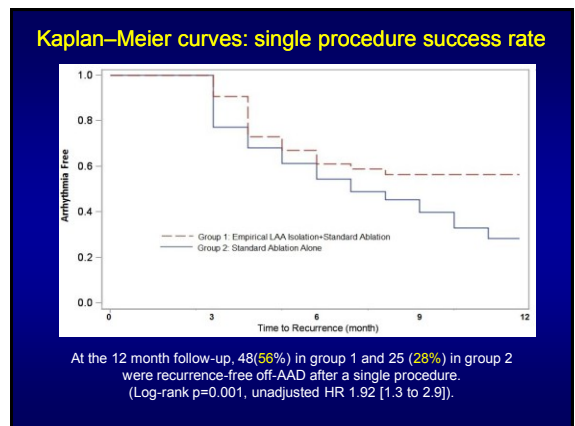
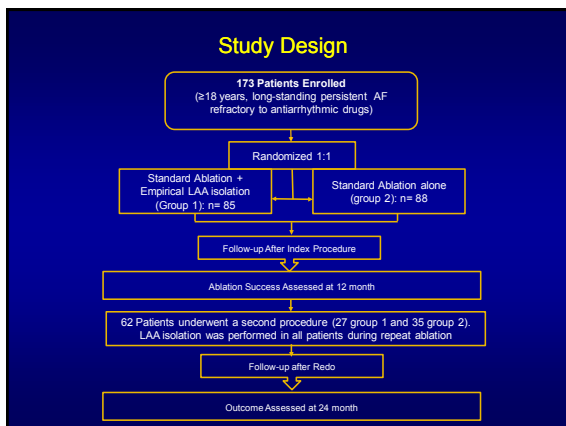
Dhananjaya Lakireddy, MD, Anu Siddhar Mahankali, MD, Arun Kamnathareddy, MD, Randall Lee, MD, Nitish Badhwar, MD, Krzysztof Baran, MD, PhD, Doreta Adonis, BS, Sushruti Bonnamana, MPharm, Jie Cheng, MD, PhD, Abhi Banerji, MD, Saig D Bane, MD, PhD, Andrew Natale, MD, Jayant Nuth, MD, Ryan Ferrell, MD, Matthew Ernest, MD, Yervu Madhu Reddy, MD

### AIM

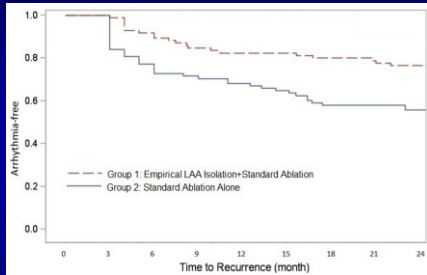
We sought to assess whether in patients with Long Standing Persistent AF the **EMPIRICAL ELECTRICAL ISOLATION** of the left atrial appendage (LAA) in addition to extensive PV antrum and triggers ablation could improve freedom from AF/AT at follow up in a multicenter randomized trial.

### Methods

- This was a randomized, parallel-group study assessing whether empirical isolation of the LAA in addition to an extensive standard ablation, could improve the freedom from atrial arrhythmia in LSP AF patients
- Power Calculation: The study had 80% power to detect at least 20% difference in success rate (50% to 70%) at 12 month follow-up (using log-rank test), with two-sided Type I error of 0.05.
- 173 patients were enrolled and randomly assigned (1:1 ratio) to:
  - Extensive ablation plus **Empirical LAA isolation** (group 1, n=85)
  - Extended PV antrum and non PV triggers ablation (group 2, n=88)
- Patients ≥18 years of age, with LSP AF refractory to antiarrhythmic drugs were included in the study



### Cumulative Overall Success After 1.3 Procedures



The cumulative success after multiple procedures was 65 (76%) in group 1 and 49 (56%) in group 2

**ALL THE PATIENTS UNDERWENT LAA ISOLATION**  
(Log-rank  $p = 0.003$ , unadjusted HR 2.24 [95% CI 1.3-3.8])

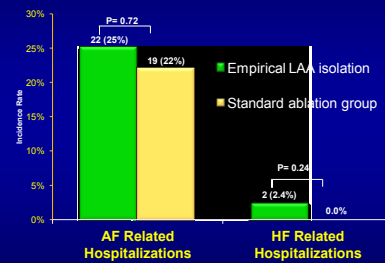
### Results: Predictor of Recurrence

- After adjusting for age, gender, LA diameter in Cox multivariate model
  - Isolation of LAA in addition to standard ablation, was associated with **55%** reduction in overall recurrence (HR 0.45 [0.26-0.77],  $p=0.004$ )

### Results: Trans-esophageal echocardiogram (TEE) after a single procedure in patients undergoing LAA isolation

- Patients undergoing LAA isolation received TEE at 6 month follow up, irrespective of their underlying rhythm
- Low peak flow velocity ( $<0.4$  m/s) in the LA appendage was observed in 48 patients

### Hospitalization



### Results: Stroke/TIA and Mortality

- Stroke/TIA:
  - No stroke or TIA was reported in the empirical LAA isolation group,
  - Four (4.5%) patients had stroke in the standard ablation group ( $p=0.12$ ). None of them in patients with LAA isolation
- No deaths occurred during the study period

### Results: Peri-Procedural Complications

- Complications:
  - One pericardial effusion occurred in each group ( $p=1.0$ )
  - One gastrointestinal bleeding was reported in Standard Ablation group ( $p=0.49$ )

## CONCLUSIONS

- The results of this randomized study show that both after a single and redo procedures in patients with long standing persistent AF, the **EMPIRICAL ISOLATION** of the **LAA** improve the long-term freedom from atrial arrhythmias without increasing complications.
- Future studies examining the physiopathology of these findings are necessary.

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