A MULTIDISCIPLINARY APPROACH TO ATRIAL FIBRILLATION: OUR EXPERIENCE WITH THE CONVERGENT PROCEDURE

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Background

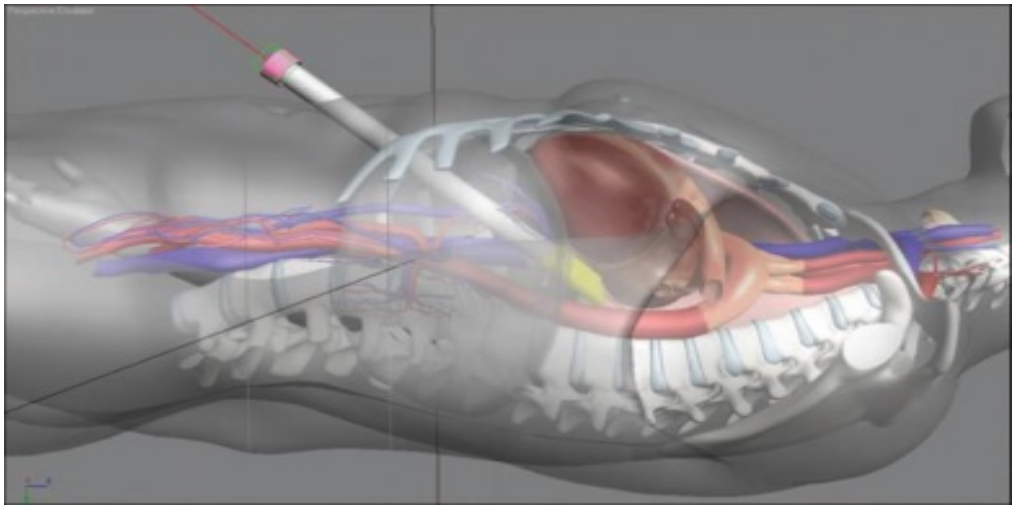
Convergent procedure

- The Convergent Procedure is a minimally invasive procedure, developed as an option for the management of refractory atrial fibrillation.
- It involves epicardial ablation of the posterior wall of the left atrium via a trans-diaphragmatic approach followed by catheter based endocardial pulmonary vein isolation.
- Performed as a 2-day staged procedure.

Background

Convergent procedure – Day 1

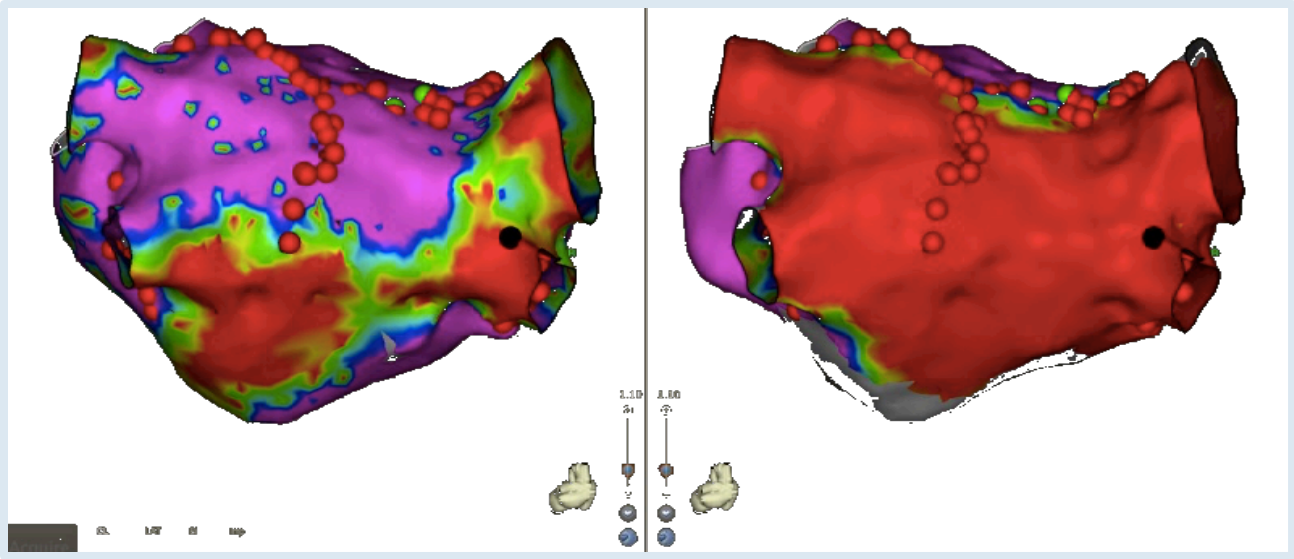
- Epicardial ablation performed by a single operator using the EPI-Sense coagulation device (Atricure, Inc., Mason, OH).



Background

Convergent procedure – Day 2

- Electrophysiology study performed with 3D electro-anatomical mapping of the left atrium and ablation with goal of pulmonary vein isolation, full posterior wall isolation, and treatment of any induced organized atrial arrhythmias.



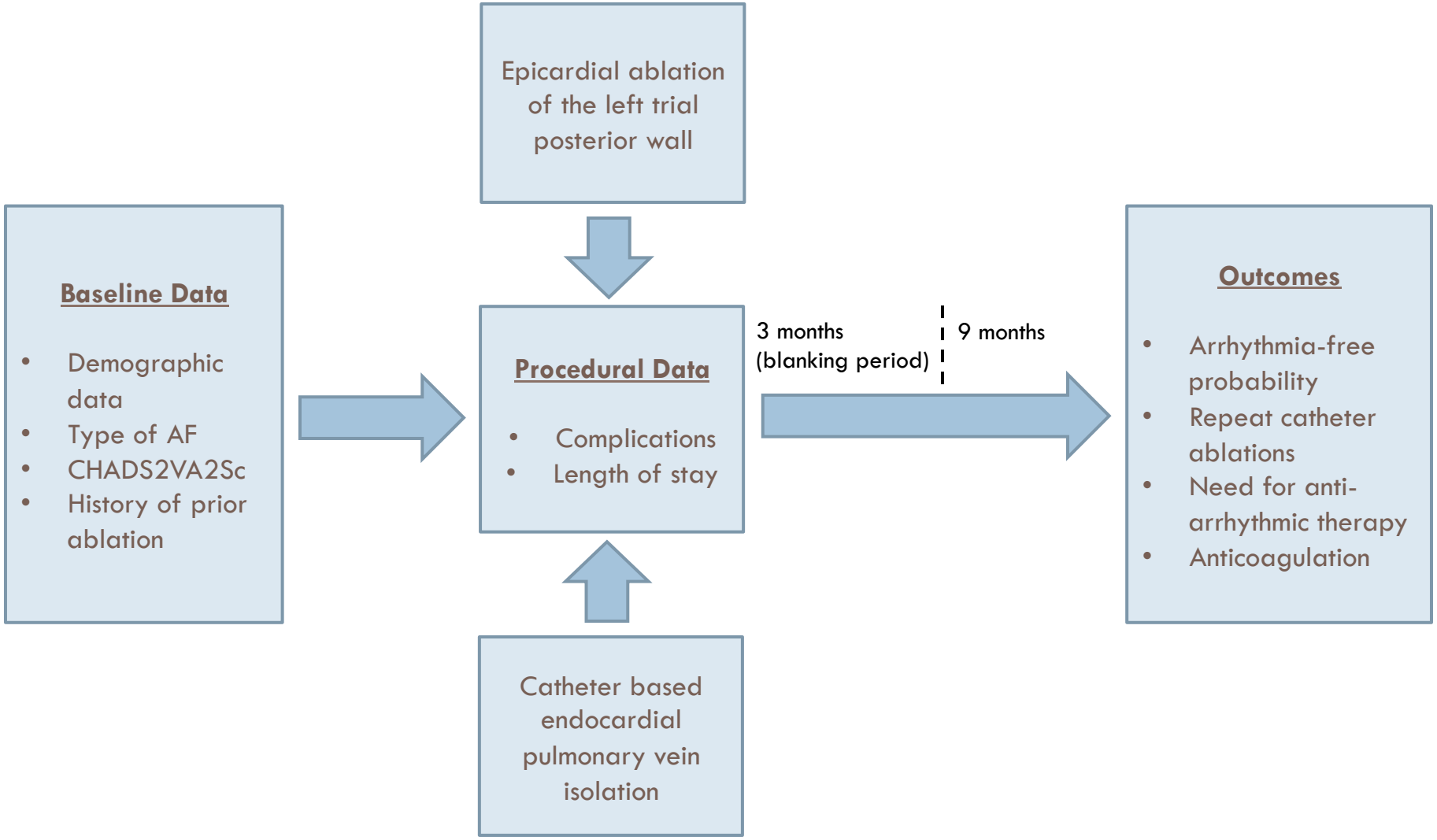
- Areas of red are electrically inactive and either represent scar or isolated areas.
- The map on the left shows the posterior wall after epicardial ablation.
- The map on the right shows electrical silence of the posterior wall and veins after pulmonary vein isolation using endocardial ablation.

Methods

- We performed a retrospective chart review of patients who underwent the convergent procedure between February 2015 and November 2016.
- Cox proportional hazard models compared the time-to-recurrence of arrhythmia (atrial flutter or atrial fibrillation) between patients with persistent vs. paroxysmal atrial fibrillation.

Methods

Flow diagram



Results

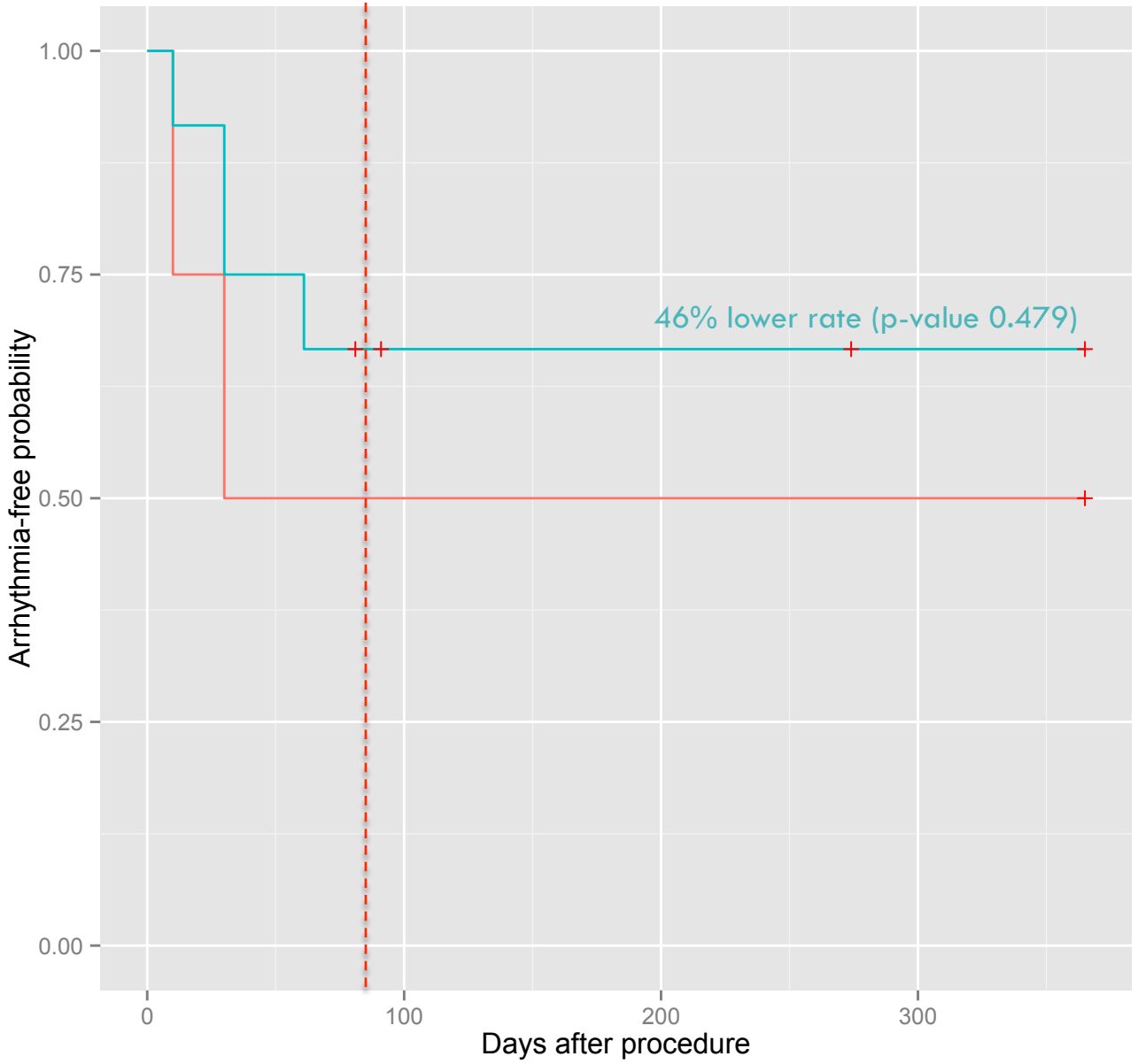
Population characteristics

Total number of participants	17
Age, years (SD)	65.4 (7.4)
Males, n (%)	13 (77%)
Pattern of AF	
Persistent, n (%)	13 (76.5%)
Paroxysmal, n (%)	4 (23.5%)
History	
HTN, n (%)	16 (94%)
DM, n (%)	4 (23.5%)
Obesity BMI>30 kg/m2, n (%)	13 (76%)
Stroke/TIA, n (%)	2 (11.8%)
CAD/Vascular, n (%)	5 (29.4%)
CHADS 2 VASC, n (SD)	2.56 (1.6)
Echocardiographic	
LA diameter, n (SD)	4.25 (0.7)
EF, n (SD)	54.3 (14.9)
Number of Anti-Arrhythmics used, n (SD)	1.56 (0.6)
Previous Cardioversions, n (%)	15 (88.2%)
Previous Catheter Ablations, n (%)	8 (47%)

Results

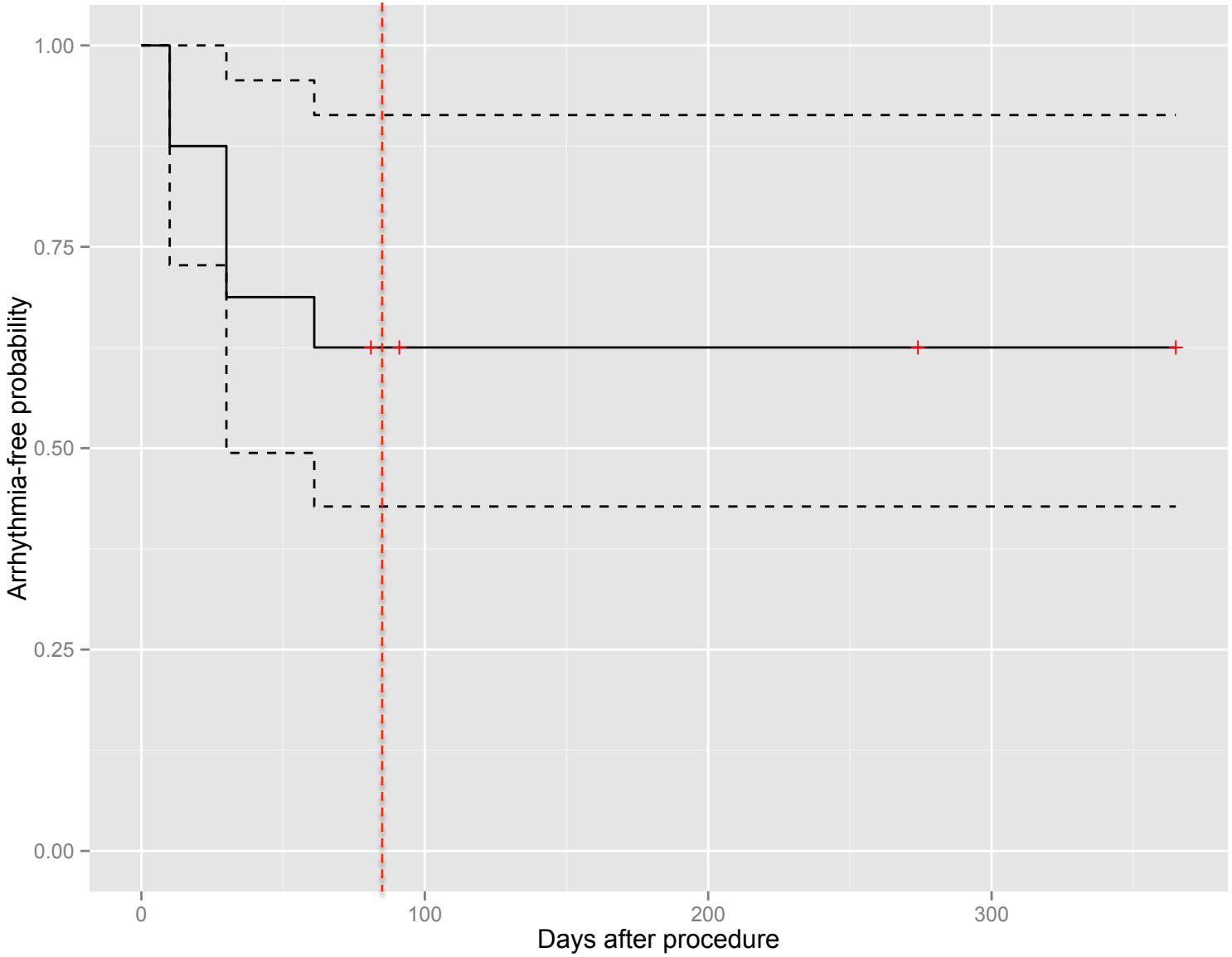
- Survival analysis did not show statistically significant difference between patients with persistent vs. paroxysmal atrial fibrillation.
- Patients with persistent atrial fibrillation did have a 46% lower rate of recurrence but this result was not statistically significant (p-value 0.479).
- After accounting for a 3-month “blanking period”, success rates were 100% at one year follow-up.

Kaplan-Meier non-parametric analysis showing time-to-event (recurrence of arrhythmias) comparing patients with persistent vs. paroxysmal atrial fibrillation.



- Dashed vertical red line: 3 month blanking period

Kaplan-Meier non-parametric analysis showing time-to-event (recurrence of arrhythmias) corresponding to the full cohort (persistent and paroxysmal atrial fibrillation).



- Dashed vertical red line: 3 month blanking period
- Dashed black lines: 95% confidence intervals

Results

- Procedural complications included acute kidney injury (2 patients, 11.76%) and liver laceration (1 patient, 5.9%).
- No cardiac tamponade, major bleeding, phrenic nerve injury, or death.
- Hospital length of stay was 4.9 ± 1.9 days.

Limitations

- Retrospective and observational design of the study.
- Low number of participants.

Conclusion

- The convergent procedure is safe and effective.
- Success rates are higher than reported success rates in catheter ablation studies including a high percentage of patients with persistent AF.
- Randomized controlled trials are necessary to validate this treatment.