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

Baseline Data
- Demographic data
- Type of AF
- CHADS2VA2Sc
- History of prior ablation

Procedural Data
- Complications
- Length of stay

Epicardial ablation of the lefttrial posterior wall

Catheter based endocardial pulmonary vein isolation

3 months (blanking period) 9 months

Outcomes
- Arrhythmia-free probability
- Repeat catheter ablations
- Need for anti-arrhythmic therapy
- Anticoagulation
## Results

### Population characteristics

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

46% lower rate (p-value 0.479)

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.