Supplement:

3D-LA volumes

The QLAB™ (PHILIPS B.V Eindhoven The Netherlands) algorithm used for calculation of left ventricular volumes was applied to LA.

The ratios particularly $S'/E'$ are non-dimensional and independent from insonation angle.

Rationale of filling time

The underlying hypothesis was that Tfill reflects matching of residual LA function with after-load primarily determined by diastolic LV relaxation and compliance. The parameter is independent from insonation angle and global strain.

Principle of algorithm for determination of filling time

Start with ECG R-wave-> find (time to) minimum strain (ejection time); calculate maximum strain-> calculate difference (maximum-minimum) and determine 70% trough -> start from minimum strain and determine time until trough is exceeded (=Tfill)-> normalize/divide by cycle length (R-R distance) or ejection time.

Model 1

$P=exp \left(-0.063*LA\ area+0.838*S'/E'\right)$; odds ratio= 2.1| $P<0.05$

Confidence intervals (95% validated by bootstrap and bias corrected), Wald statistics and p-values:

- LA area: confidence: -0.151 - -0.158; Wald: 9.329; $p_{bootstrap} = 0.02$.
- $S'/E'$: confidence: 0.167 - 1.843; Wald: 3.556; $p_{bootstrap} = 0.07$.

Model 2

Model: $P=exp \left(0.139*LA\ area+0.019* IVRT- 2.507*S'/E' -0.12*BMI\right)$; odds ratio= 3.7| $P<0.05$

Confidence intervals (95% validated by bootstrap and bias corrected), Wald statistics and p-values:

- LA area: confidence: 0.0573 - 0.2207; Wald: 11.0; $p_{bootstrap} = 0.01$.
- IVRT: confidence: 0.005 - 0.037; Wald: 6.8; $p_{bootstrap} = 0.01$.
- $S'/E'$: confidence: -5.115 - -0.627; Wald: 6.7; $p_{bootstrap} = 0.02$.
- BMI: confidence: -0.214 - -0.063; Wald: 8.6; $p_{bootstrap} = 0.01$.
Supplement Figure 1: Survival free of recurrent atrial fibrillation after PVI in subset of patients stratified with respect to initial diagnosis.
Supplement Figure 2: CRT – analysis top: test; bottom: validation
Results

Follow-up exceeding 3 months was available in 46 (59%) patients (HR: 71±23 b/min) with successful and in 32 (41%) patients (HR: 79±20 b/min) with recurrent AF.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Success</th>
<th>rec. AF</th>
<th>t-Test</th>
<th>AUC (95% confidence)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T_eject (ms)</td>
<td>428±132</td>
<td>421±196</td>
<td>n.s.</td>
<td>0.539 (0.440-0.638)</td>
</tr>
<tr>
<td>T_ejectN (%)</td>
<td>48±13</td>
<td>53±18</td>
<td>n.s.</td>
<td>0.619 (0.521-0.718)</td>
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<tr>
<td>T_fill (ms)</td>
<td>401±203</td>
<td>247±195</td>
<td>&lt;0.001</td>
<td>0.715 (0.627-0.803)</td>
</tr>
<tr>
<td>T_fillN (%)</td>
<td>43±17</td>
<td>31±19</td>
<td>&lt;0.001</td>
<td>0.689 (0.597-0.781)</td>
</tr>
<tr>
<td>CL (ms)</td>
<td>917±246</td>
<td>810±206</td>
<td>0.008</td>
<td>0.667 (0.573-0.760)</td>
</tr>
</tbody>
</table>

Classification and regression tree analysis (SPSS V20) yielded an odd for recurrence of AF of 0.18 with T_fill>240ms versus 1.5 with T_fill<240. Sensitivity was 0.75 and specificity was 0.74 at this cut-off. In binary regression T_fill was a significant parameter in addition to LA-volumes and deceleration times.