

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 (-0.063*LA area+0.838*S'/E'); 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 (0.139*LA area+0.019* IVRT- 2.507*S'/E'-0.12*BMI); odds ratio= 3.7| P<0.05¹

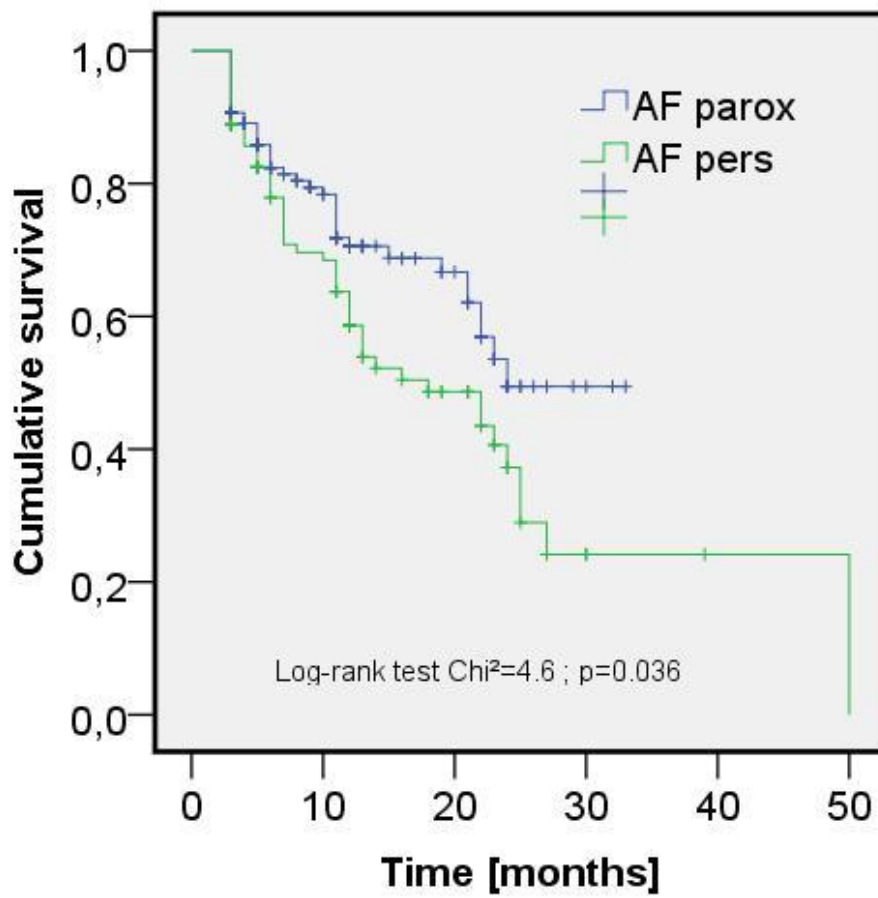
Confidence intervals (95% validated by bootstrap and bias corrected), Wald statistics and p-values:

LA area: confidence: 0.0573- 0.2207; Wald: 11.0; p_{bootstrap} = 0.01.

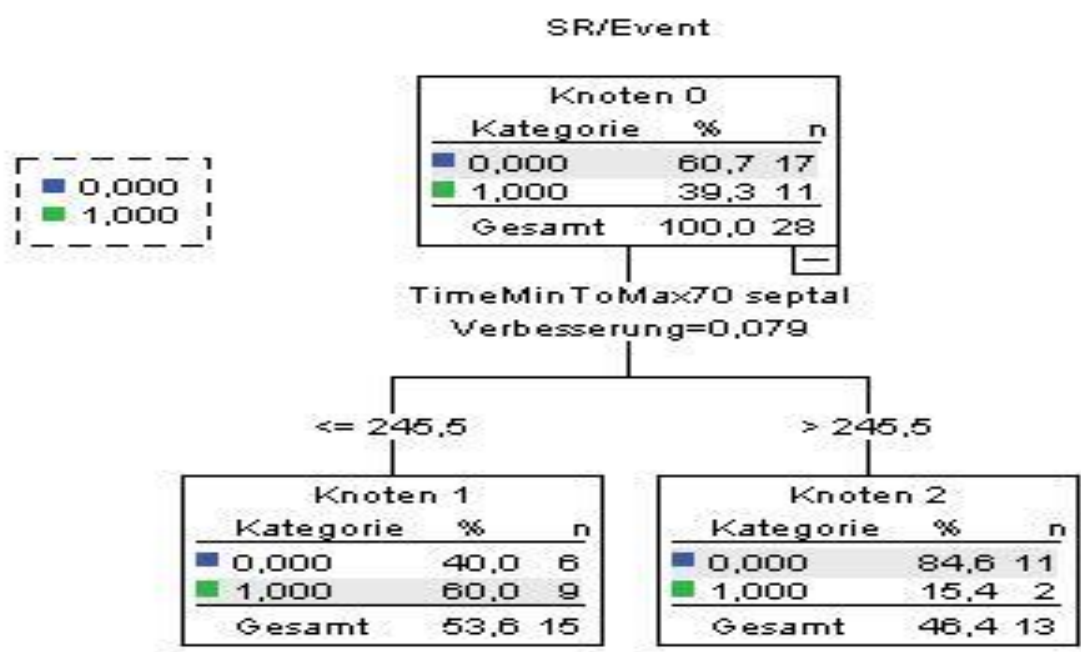
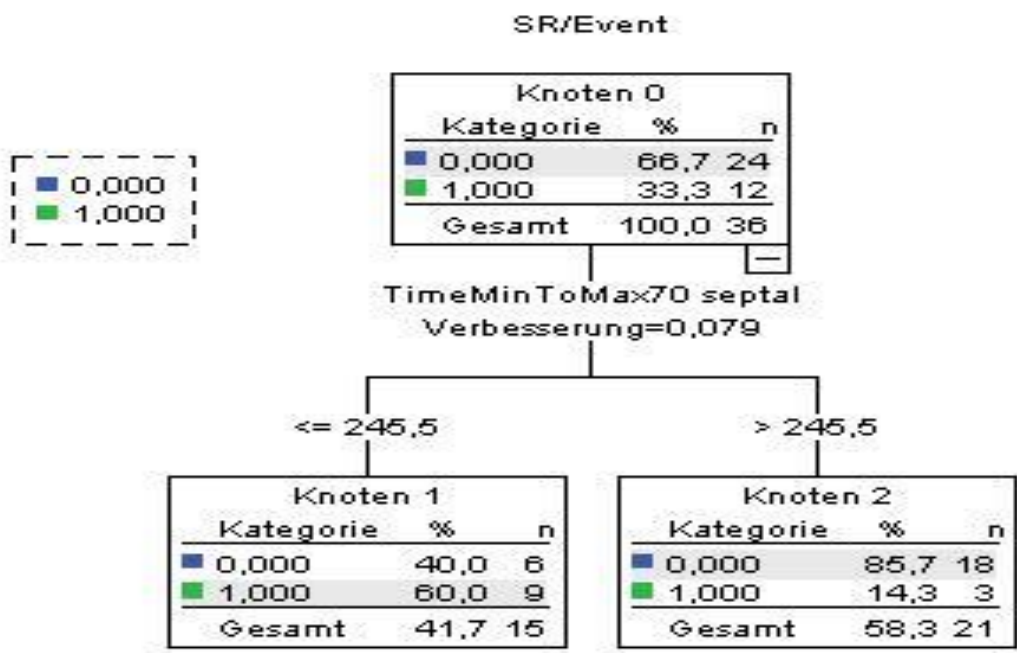
IVRT: confidence: 0.005- 0.037; Wald: 6.8; p_{bootstrap} = 0.01.

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.

| Parameter | Success | rec. AF | t-Test | AUC (95% confidence) |
|-------------|---------|---------|--------|----------------------|
| Teject (ms) | 428±132 | 421±196 | n.s. | 0.539 (0.440-0.638) |
| TejectN (%) | 48±13 | 53±18 | n.s. | 0.619 (0.521-0.718) |
| Tfill (ms) | 401±203 | 247±195 | <0.001 | 0.715 (0.627-0.803) |
| TfillN (%) | 43±17 | 31±19 | <0.001 | 0.689 (0.597-0.781) |
| CL (ms) | 917±246 | 810±206 | 0.008 | 0.667 (0.573-0.760) |

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