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Possible clinical and hemodynamic predictors of atrial fibrillation recurrence after catheter ablation

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BACKGROUND

- Catheter ablation is considered to improve symptoms and quality of life for patients with atrial fibrillation (AFib) and may be regarded as first-line treatment especially in paroxysmal forms
- Large proportion of patients with AFib are not arrhythmia-free after ablation and remain at risk for complications such as stroke and cardiac morbidity

AIM AND STUDY DESIGN

- Analysis of possible predictors of recurrence of atrial fibrillation after catheter ablation with the subsequent formation of a mathematical model predicting the efficacy of interventional treatment
- 148 pts enrolled with paroxysmal and persistent AFib (mean age 52+9.2 yrs, male 87 (59%)) after RFA

RECURRENCE OF AFib

- AFib episodes lasting more than 30 seconds, recorded during a routine electrocardiogram or daily monitoring
- Follow –up period 5 yrs

RATE OF AFib RECURRENCE



PERIPROCEDURAL COMPLICATIONS

Complication	N (abs/%)
Hemopericardium	2 pts (1.4%)
Perforation of IVS and LV wall	2 pts (1.4%)
Left PV stenosis	1 pt (0.7%)

LATE ADVERSE CV EVENTS

MACE	N (abs/%)
Ischemic stroke	1 pt (0.7%)
Hemorrhagic stroke	1 pt (0.7%)
Myocardial infarction	2 pts (1.4%)
Death	-
Recurrent hospitalisation	29 (19.6%)

Predictors of AFib recurrence (before RFA)

dilation of the left atrium (LA) (r = -0.58, p<0.001)
age (r = 0.66, p<0.001)
antiarrhythmic treatment (r = 0.40, p<0.001) *
aortic regurgitation (r = 0.55, p<0.001)
mitral regurgitation (r = 0.41, p<0.001)

* 0 - Without medication,

- 1- Amiodarone,
- 2- Sotalol,
- 3- β-blockers,
- 4- Allapinine/ Etacisin,
- 5- Propafenone

risk of AF recurrence (N)* = -14.4+ 0.12*age + 0.21*LA diameter- 0.5*previous antiarrhythmic treatment+ 2.33*aortic regurgitation+ 0.89*mitral regurgitation.

* N >0,5 – relatively high risk of AFib recurrence N ≤0,5 – favorable prognosis of sinus rhythm maintenance

Predictors of AFib recurrence (after RFA)

- >left atrium dilation(r=0,58, p<0,001)</pre>
- >age (r=0,66, p<0,001)
- >RFA techniques (r = -0,69, p < 0,001)*
- >duration of post-operative period (months) (r = -0,63, p<0,001)
- >in-hospital AF recurrence (r=0,64, p<0,001)</pre>
- > number of RF applications (r= -0,59, p < 0,001)</p>
- antiarrhythmic treatment (r= -0,40, p<0,001)</p>
- > aortic regurgitation (r=0,55, p<0,001)</p>
- > mitral regurgitation (r=0,41, p<0,001)</p>
 - 1- ganglionary plexi ablation
 - 2- ganglionary plexi ablation + PV isolation
 - 3 PV isolation

Three types of prognosis after RFA

(1) Sinus rhythm N = 64

AFib recurrence N = 84

(2) Until 6 months N=50

(3) After 6 months N=34

First type of prognosis – without AFib recurrence

risk of AF recurrence (N)* = -75 +0.82*age +0.99*months after RFA -1.79*in-hospital AF recurrence +2*aortic regurgitation + 1.33*LA diameter + 2.9*previous antiarrhythmic treatment + 0.04*number of RF applications + 4.8*type of RFA -0.96*mitral regurgitation.

Second type of prognosis – AFib recurrence within 6 months

risk of AF recurrence (N)* = - 75,8 + 0,88*age +0.29*months after RFA +0.8*in-hospital AF recurrence +3.9*aortic regurgitation + 1.48*LA diameter + 2.39*previous antiarrhythmic treatment + 0.03*number of RF applications + 4.11*type of RFA -0.38*mitral regurgitation.

Third type of prognosis – AFib recurrence after 6 months

risk of AF recurrence (N)* = - 82,9 + 0,96*age -0.19*months after RFA +3.11*in-hospital AF recurrence +6.5*aortic regurgitation + 1.6*LA diameter + 1.46*previous antiarrhythmic treatment + 0.02*number of RF applications + 3.45*type of RFA+ 1.1*mitral regurgitation.

Evaluation of prognosis

For each patient three formulas should be calculated and type of prognosis after RFA is determined by maximal value



Classification matrix predicting the risk of recurrence of atrial fibrillation

Group of pts	% of correct classifications	1 type	2 type	3 type
Group 1 (sinus rhythm)	95,3%	61	3	0
Group 2 (AFib within 6 months)	80%	7	40	-3
Group 3 (AFib after 6 months)	88,2%	0	4	30
All groups	89,5%	68	47	33

Limitations

>Only one center experience

>We don't use correlation with LA fibrosis (MRI)

We don't use implanted monitors for evaluating short and/or asymptomatic recurrent AFib paroxysms

>And

Limitations

Universal predictors of recurrence of AF in the postoperative period are lacking while there is possible combination of several clinical and hemodynamic factors that may have an additive effect

Conclusions

The first mathematical model evaluating initial risk of post-operative AF recurrence may be used before RFA to optimize screening of patients with favorable prognosis of sinus rhythm maintenance

The second approach taking into account possible predictors of arrhythmia recurrence allows to optimize management of AF patients after catheter ablation



Thank you!