Role katetrizační ablace fibrilace síní v léčbě srdečního selhání

Jan Škoda

Nemocnice Na Homolce

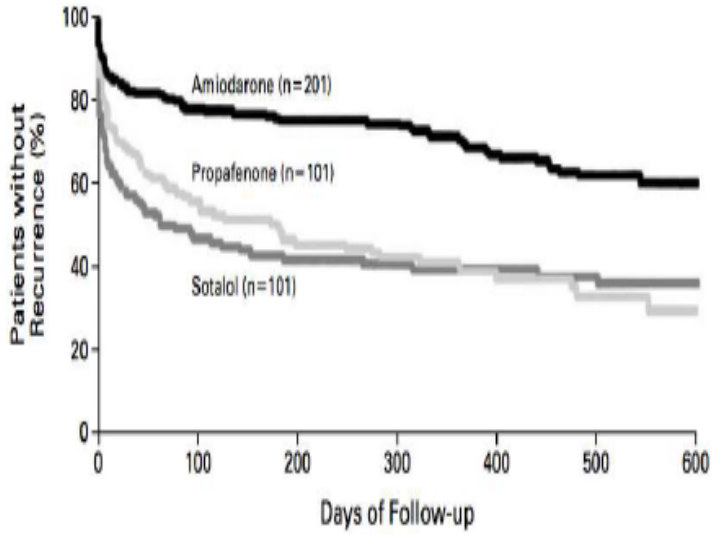
Co očekáváme od katetrizační ablace FiS u srdečního selhání

- Zlepšení klinických obtíží
- Zlepšení tolerance zátěže
- Zlepšení kvality života
- Snížení rizika CMP
- Zlepšení ejekční frakce LK
- Mortalitní benefit

Limitace účinku antiarytmik

AMIODARONE TO PREVENT RECURRENCE OF ATRIAL FIBRILLATION

DENIS ROY, M.D., MARIO TALAJIC, M.D., PAUL DORIAN, M.D., STUART CONNOLLY, M.D., MARK J. EISENBERG, M.D., M.P.H., MARTIN GREEN, M.D., TERESA KUS, M.D., JEAN LAMBERT, PH.D., MARC DUBUC, M.D., PIERRE GAGNÉ, M.D., STANLEY NATTEL, M.D., AND BERNARD THIBAULT, M.D., FOR THE CANADIAN TRIAL OF ATRIAL FIBRILLATION INVESTIGATORS*



Mean FU duration 16 months

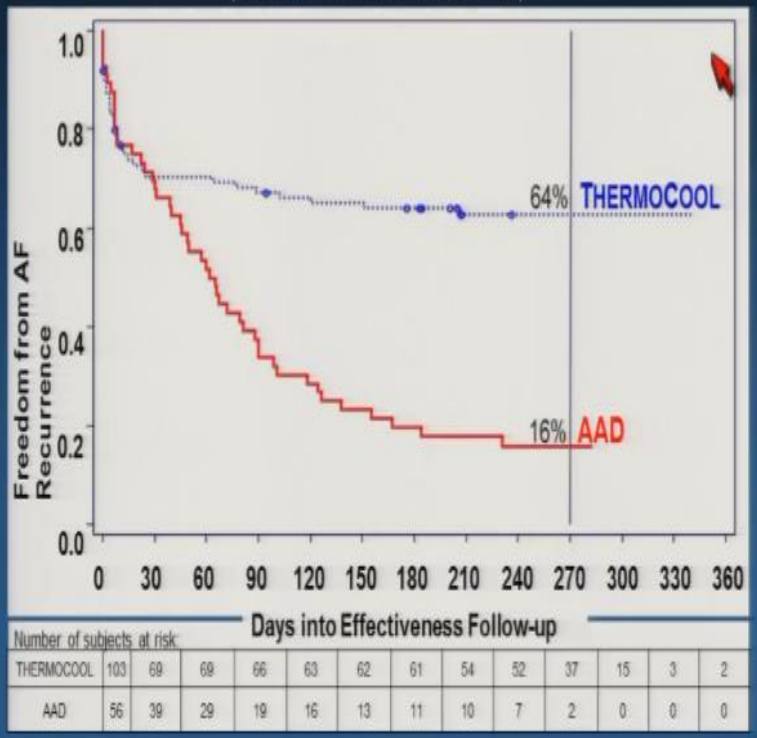
AF Recurrence 35% with Amiodarone and 63% with sotalol and propafenone (P<0.001)

Roy et al. NEJM 2000

NAVISTAR® THERMOCOOL® Catheter for the Radiofrequency Ablation of Symptomatic Paroxysmal Atrial Fibrillation

PMA # P030031/S11

KM Curve of Time to Chronic Failures By Randomization Group
(Effectiveness Cohort, n=159)



Number of subjects at risk:

THERMOCOOL	103	69	69	66	63	62	61	54	52	37	15	3	2
AAD	56	39	29	19	16	13	11	10	7	2	0	0	0

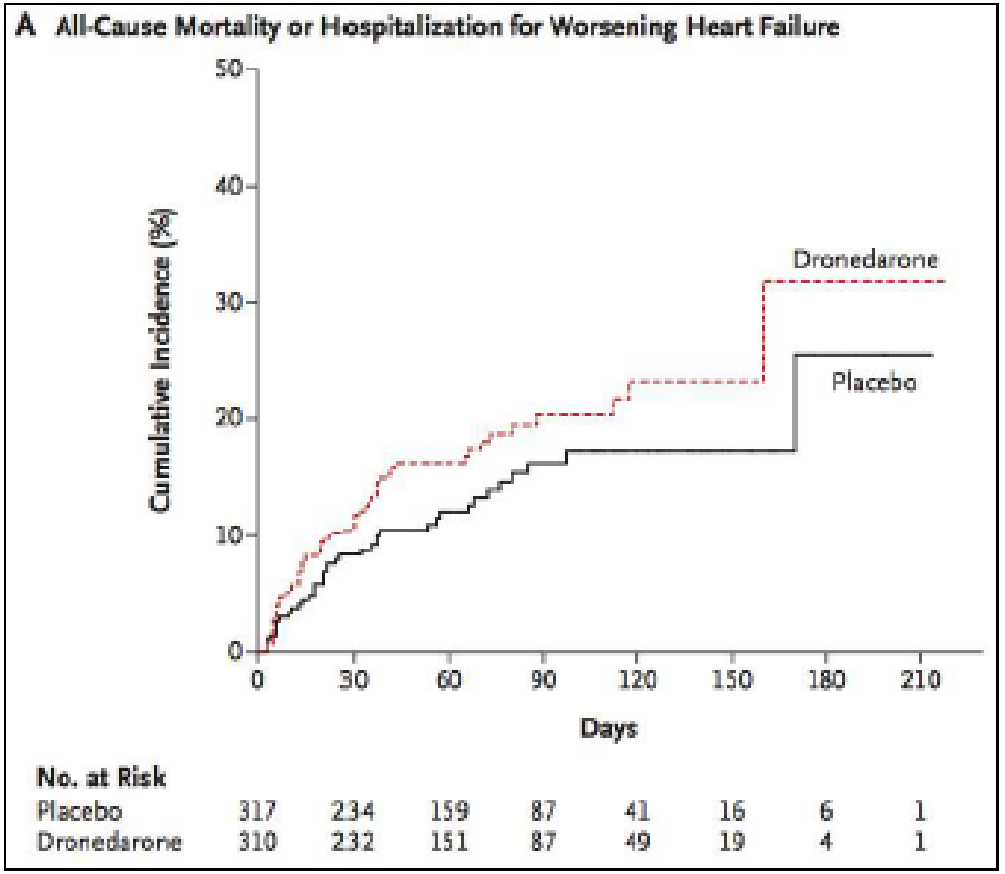
Limitace účinku antiarytmik

ORIGINAL ARTICLE

Increased Mortality after Dronedarone Therapy for Severe Heart Failure

Lars Køber, M.D., Christian Torp-Pedersen, M.D., John J.V. McMurray, M.D., Ole Gøtzsche, M.D., Samuel Lévy, M.D., Harry Crijns, M.D., Jan Amlie, M.D., and Jan Carlsen, M.D., for the Dronedarone Study Group*

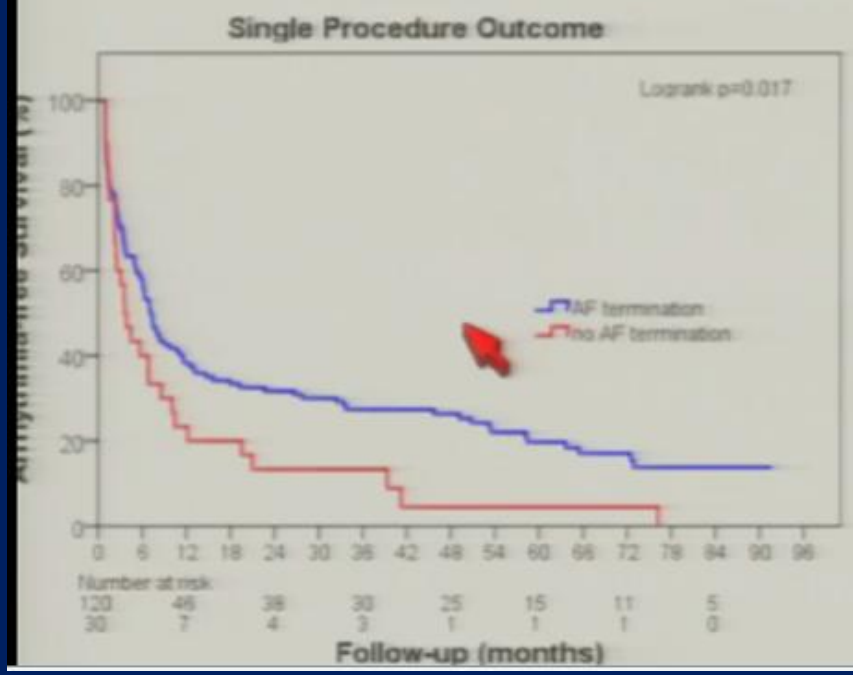
- **Multicenter study with a double-blind design**
- **Planned to randomly assign 1000 patients who were hospitalized with symptomatic heart failure and severe left ventricular systolic dysfunction to receive 400 mg of dronedarone twice a day or placebo**
- **The primary end point was the composite of death from any cause or hospitalization for heart failure**
- **Study was terminated earlier after higher rate of death in the Dronedarone group**

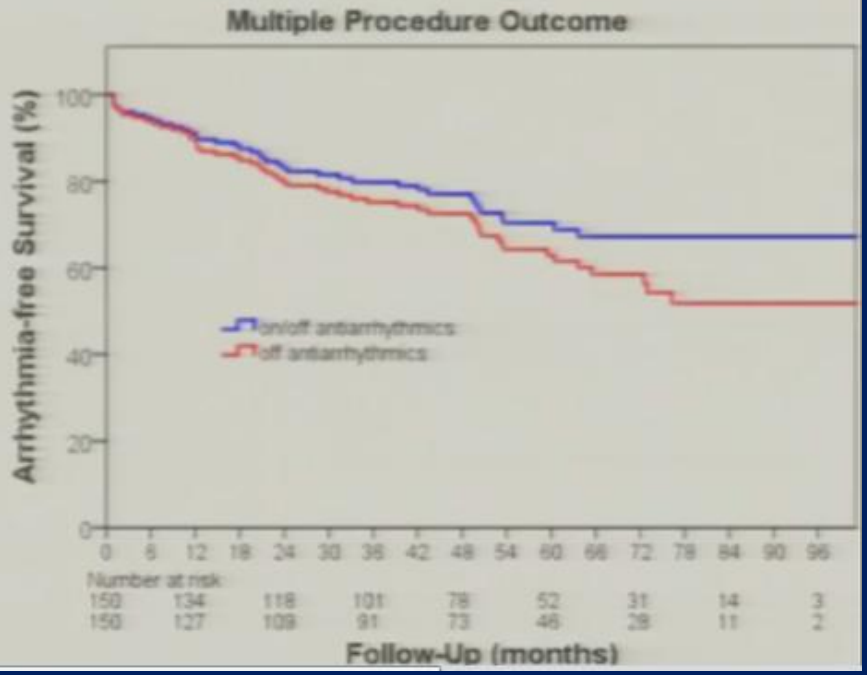


Kober et al NEJM 2008

Dlouhodobá efektivita katetrizační ablace FiS

Five-Year Outcome of Catheter Ablation of Persistent Atrial Fibrillation Using Termination of Atrial Fibrillation as a Procedural Endpoint
D Scherr, P Khairy, Shinsuke Miyazaki, V Aurillac-Lavignolle, P Pascale, S Wilton, K Ramoul, Yuki Komatsu, L Roten, A Jadidi, N Linton, M Pedersen, M Daly, M O'Neill, S Knecht, R Weerasooriya, T Rostock, M Manninger, H Cochet, A Shah, S Yeim, A Denis, N Derval, M Hocini, F Sacher, M Haissaguerre, P Jais. Circulation: Arrhythmia and Electrophysiology. 2015; 8: 18-24



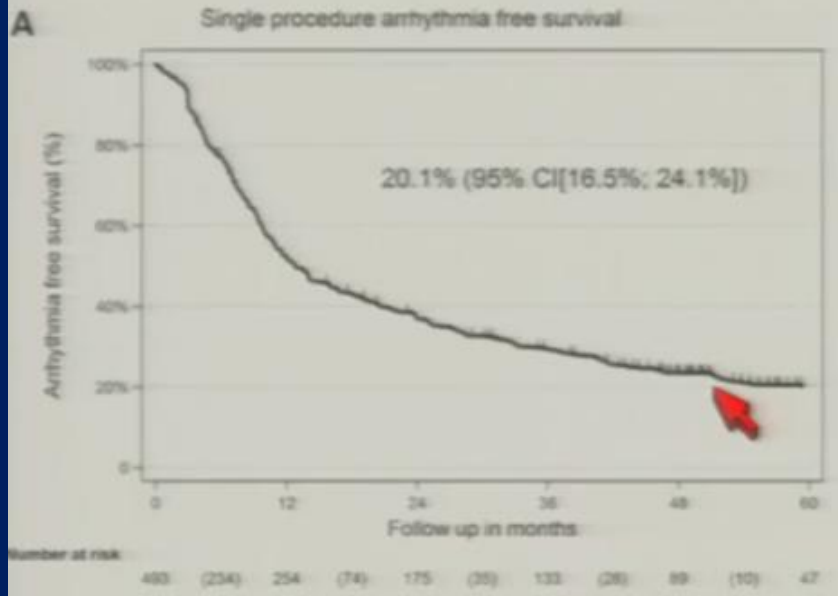


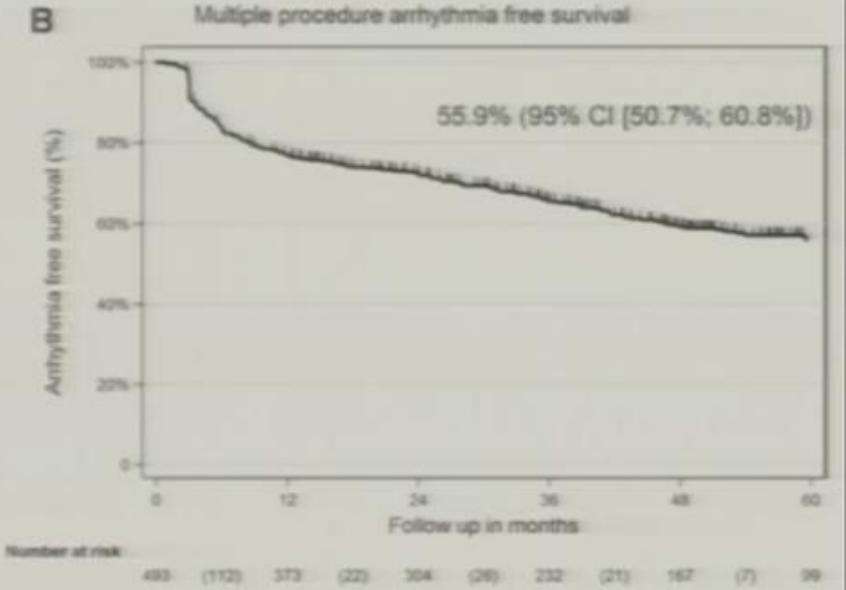
Dlouhodobá efektivita katetrizační ablace FiS

Persistent Atrial Fibrillation Using the Stepwise Approach and Prognostic Factors for Success

Doreen Schreiber, MD*; Thomas Rostock, MD*; Max Fröhlich; Arian Sultan, MD; Helge Servatius, MD; Boris A. Hoffmann, MD; Jakob Lüker, MD; Imke Berner, MD; Benjamin Schäffer, MD; Karl Wegscheider, PhD; Susanne Lezius, MSc; Stephan Willems, MD; Daniel Steven, MD

Circ A EP 2015;8:308-317.





Izolace plicních žil vs ablace AVN u HF

ORIGINAL ARTICLE

Pulmonary-Vein Isolation for Atrial Fibrillation in Patients with Heart Failure

Mohammed N. Khan, M.D., Pennjali, M.D., Jennifer Cummings, M.D., Luigi Di Biase, M.D., Prashanthan Sanders, M.D., David O. Martin, M.D., Josef Kautzner, M.D., Steven Hao, M.D., Sakis Themistoclakis, M.D., Raffaele Fanelli, M.D., Domenico Potenza, M.D., Raimondo Massaro, M.D., Giovanna Warni, M.D., Robert Schweikert, M.D., Walid Saliba, M.D., Paul Wang, M.D., Amin Al-Ahmad, M.D., Salwa Beheiry, M.D., Pietro Santarelli, M.D., Randall C. Starling, M.D., Antonio Dello Russo, M.D., Gemmu Pelargonio, M.D., Johannes Brachmann, M.D., Volker Schibgilla, M.D., Aldo Bonso, M.D., Michela Casella, M.D., Antonio Raviele, M.D., Michel Haissaguerre, M.D., and Andrea Natale, M.D., for the PABA-CHF Investigators*

ABSTRACT

BACKGROUND

Pulmonary-vein isolation is increasingly being used to treat atrial fibrillation in patients with heart failure.

METHODS

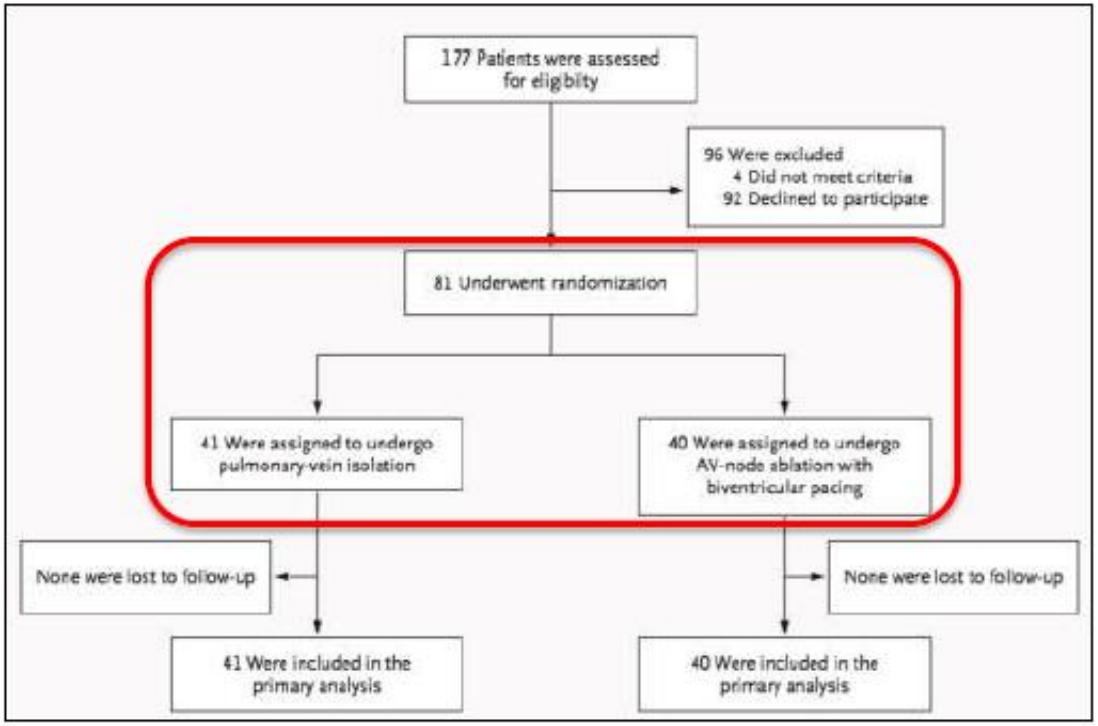
In this prospective, multicenter clinical trial, we randomly assigned patients with symptomatic, drug-resistant atrial fibrillation, an ejection fraction of 40% or less, and New York Heart Association class II or III heart failure to undergo either pulmonary-vein isolation or atrioventricular-node ablation with biventricular pacing. All patients completed the Minnesota Living with Heart Failure questionnaire (scores range from 0 to 105, with a higher score indicating a worse quality of life) and underwent echocardiography and a 6-minute walk test (the composite primary end point). Over a 6-month period, patients were monitored for both symptomatic and asymptomatic episodes of atrial fibrillation.

RESULTS

In all, 41 patients underwent pulmonary-vein isolation, and 40 underwent atrioventricular-node ablation with biventricular pacing; none were lost to follow-up at 6 months. The composite primary end point favored the group that underwent pulmonary-vein isolation, with an improved questionnaire score at 6 months (66 vs. 82 in the group that underwent atrioventricular-node ablation with biventricular pacing; P<0.001), a longer 6-minute-walk distance (340 m vs. 297 m, P<0.001), and a higher ejection fraction (39% vs. 28%, P<0.001). In the group that underwent pulmonary-vein isolation, 88% of patients receiving antiarrhythmic drugs and 73% of those not receiving such drugs were free of atrial fibrillation at 6 months. In the group that underwent pulmonary-vein isolation, pulmonary-vein stenosis developed in two patients, pericardial effusion in one, and pulmonary edema in another; in the group that underwent atrioventricular-node ablation with biventricular pacing, lead dislodgment was found in one patient and pneumothorax in another.

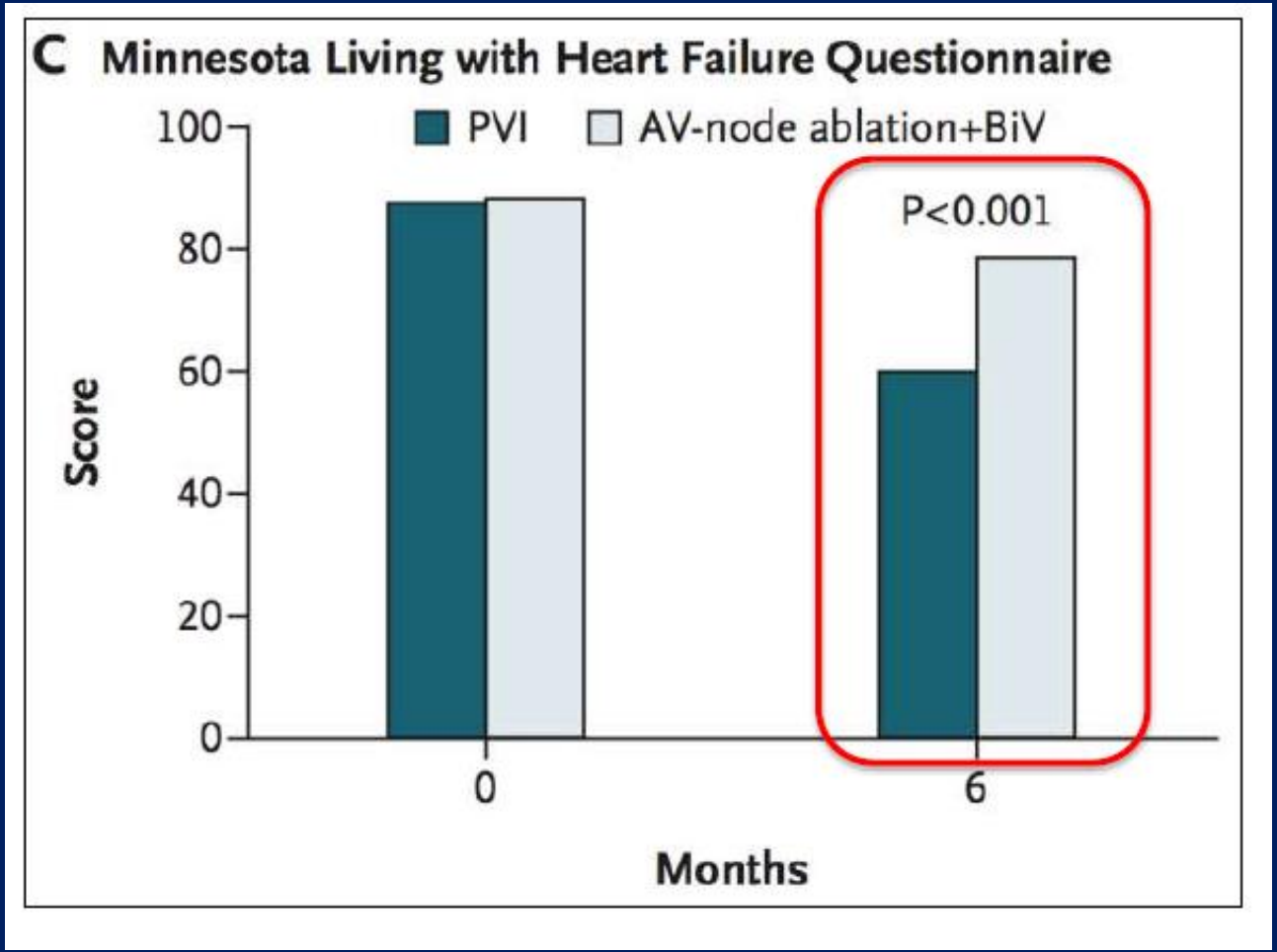
CONCLUSIONS

Pulmonary-vein isolation was superior to atrioventricular-node ablation with biventricular pacing in patients with heart failure who had drug-refractory atrial fibrillation. (ClinicalTrials.gov number, NCT00099996.)

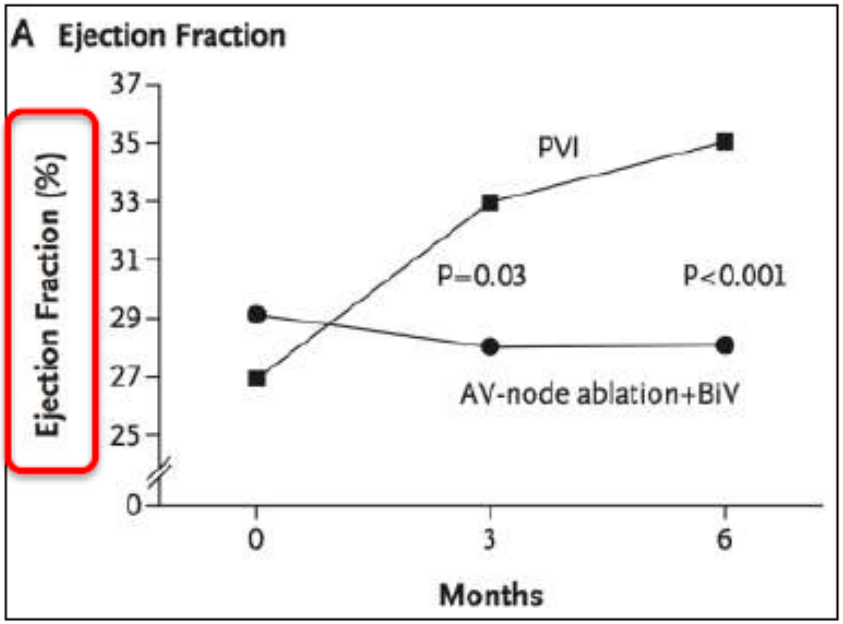


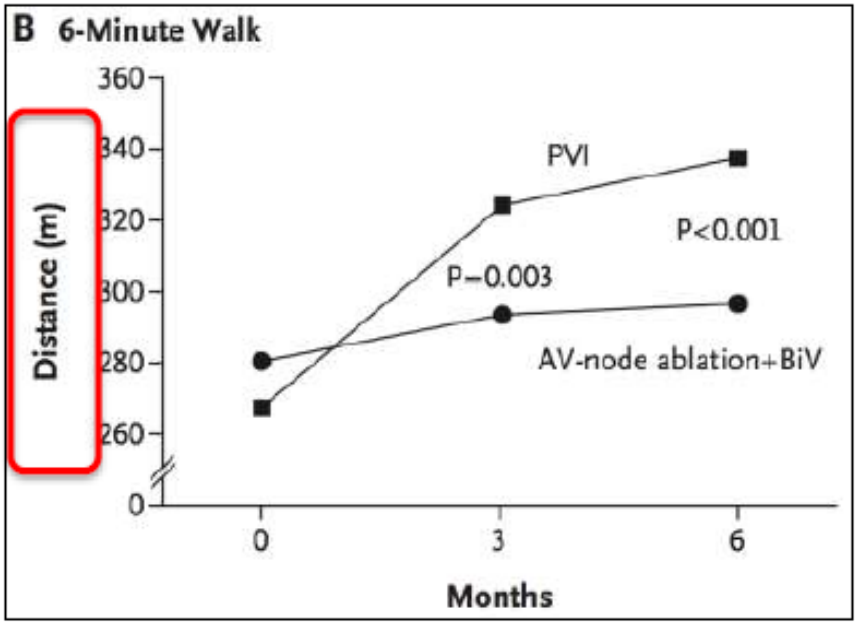
Khan et al NEJM 2008

Izolace plicních žil vs ablace AVN u HF



Izolace plicních žil vs ablace AVN u HF





Khan et al NEJM 2008

Randomizovaná studie: ablace perzist FiS x rate control (ARC-HF)

A Randomized Trial to Assess Catheter Ablation Versus Rate Control in the Management of Persistent Atrial Fibrillation in Heart Failure

David G. Jones, MD,*† Shouvik K. Haldar, MBBS,*† Wajid Hussain, MB, ChB,*† Rakesh Sharma, PhD,*† David P. Francis, MD,† Shelley L. Rahman-Haley, MD,* Theresa A. McDonagh, MD,*† S. Richard Underwood, MD,*† Vias Markides, MD,*† Tom Wong, MD*†
London, United Kingdom

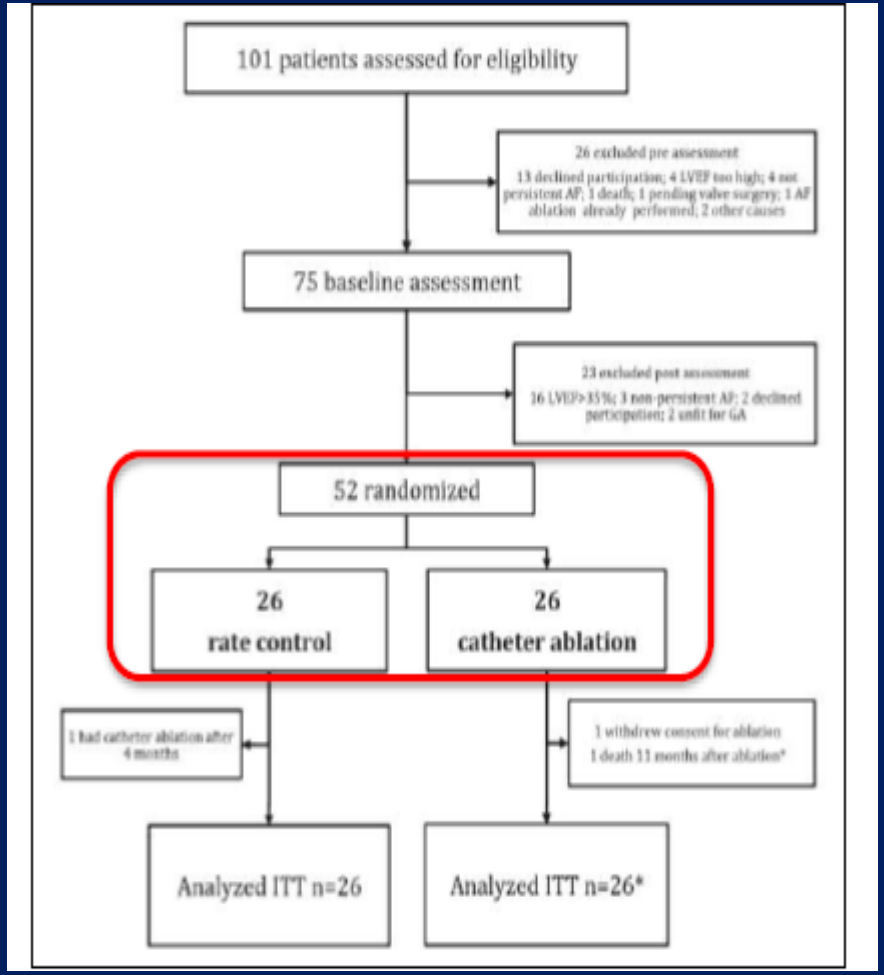
EF pod 35%

FUP 12 mo

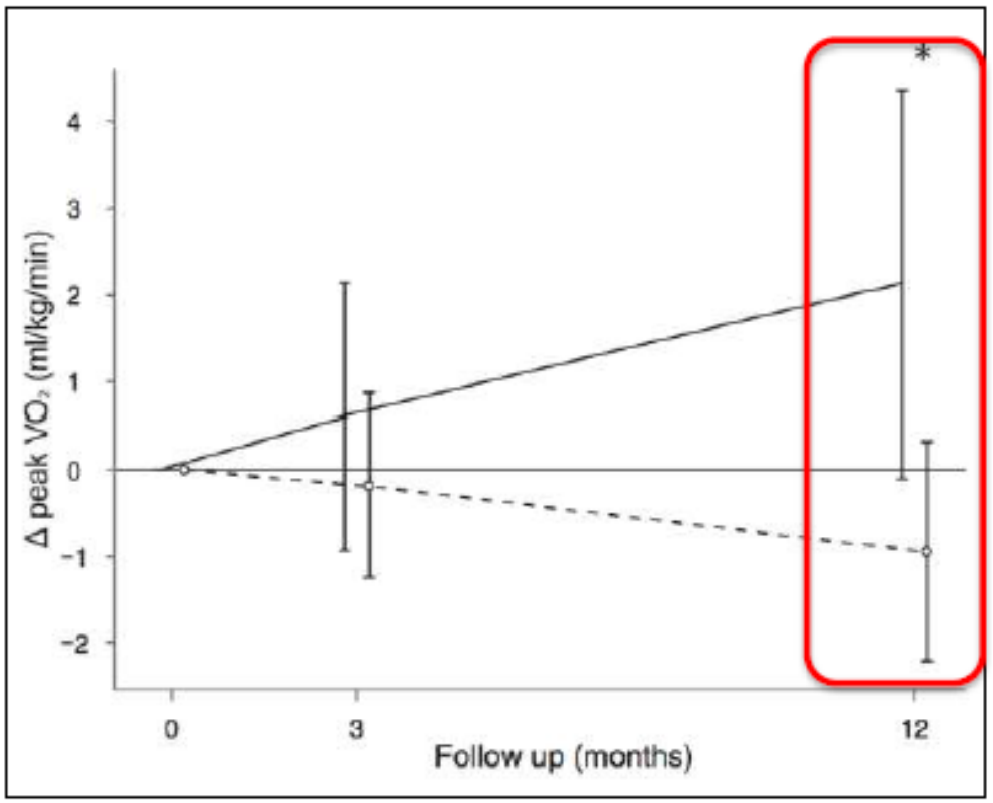
Primíární cíl:
změna Vo2 max

Sekund cíle:

BNP
6min test chůze
EFLK

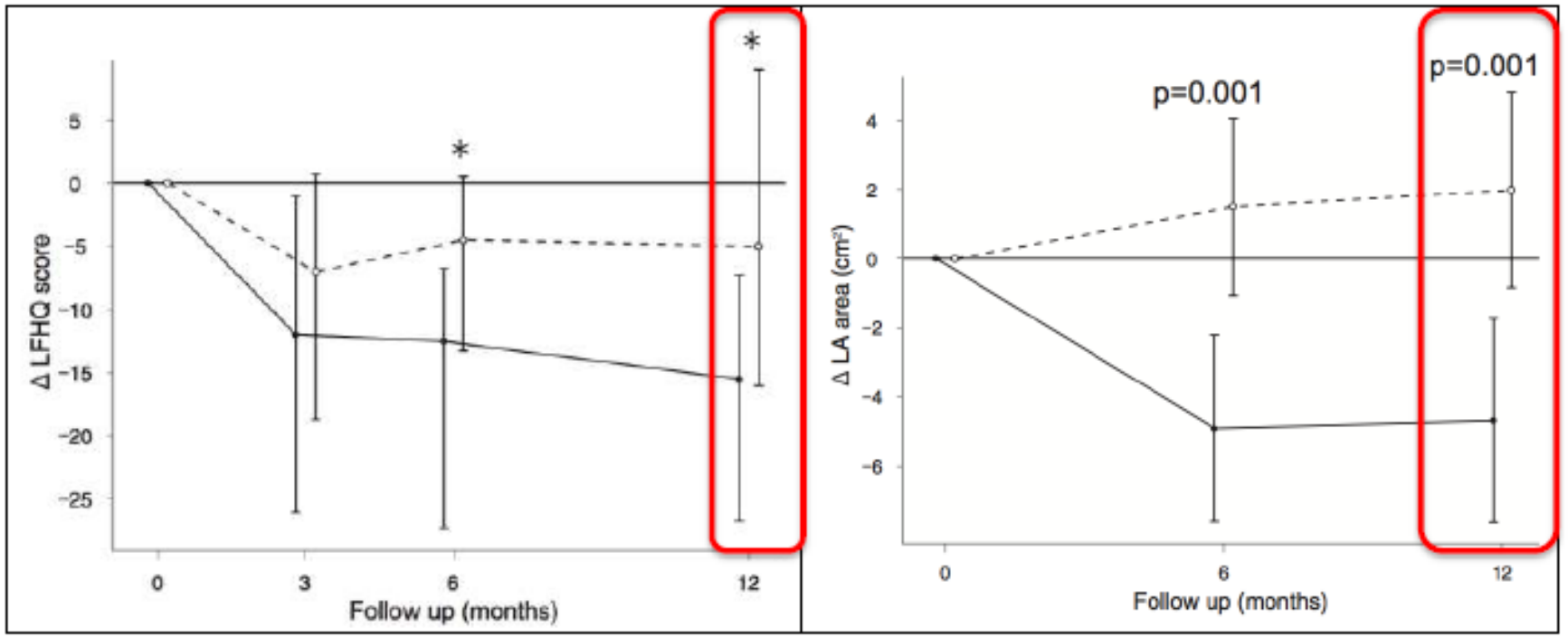


Randomizovaná studie ARC-HF ablace perzist FiS x rate control



Jones et al. JACC 2013

Randomizovaná studie ARC-HF ablace perzist FiS x rate control

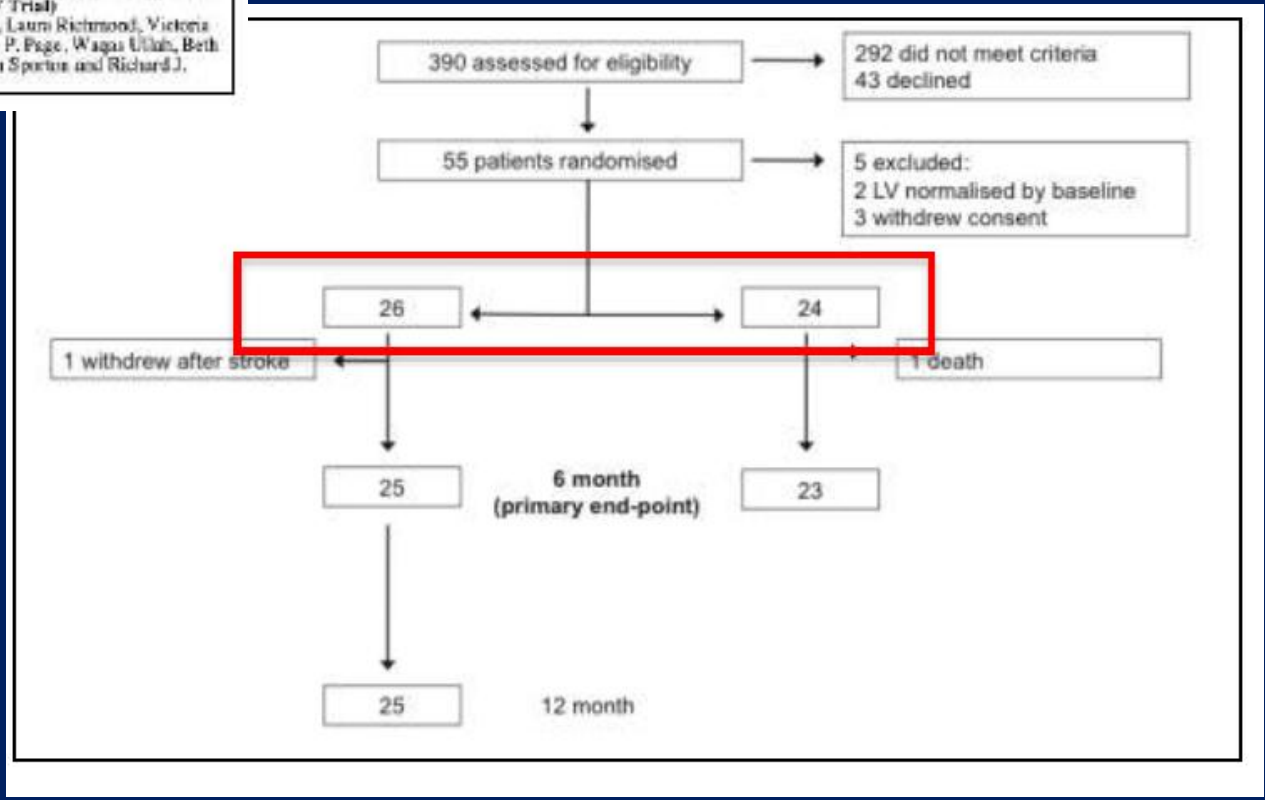


Jones et al. JACC 2013

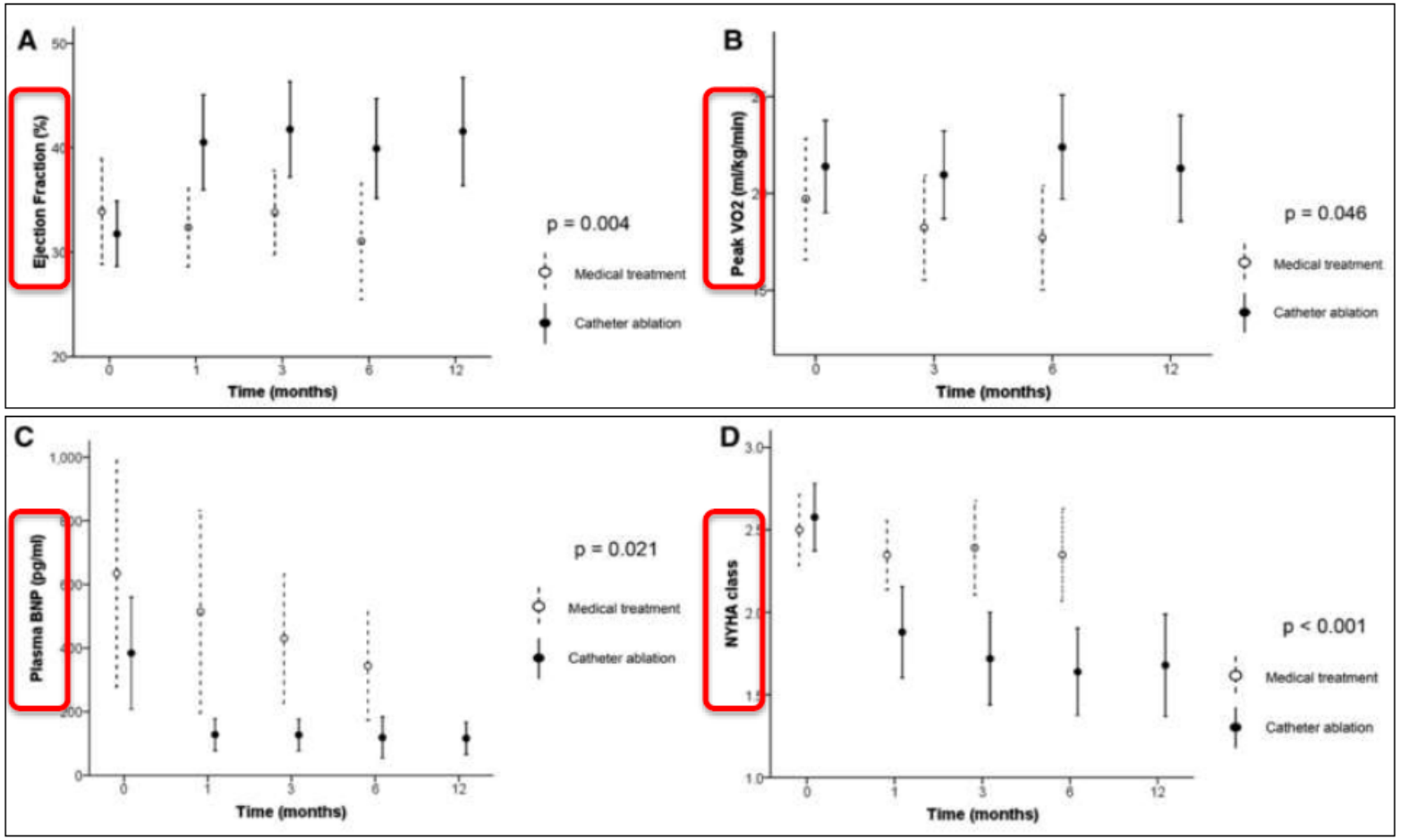
Randomizovaná studie ablace perzist FiS x AA medikace (CAMTAF)

EF pod 50% (prům 33%)
Prim cíl : diff LVEF 6 Mo

Sek cíle:
proBNP
V02 max
NYHA



Randomizovaná studie ablace perzist FiS x AA medikace (CAMTAF)



Hunter et al. Circ AE 2014

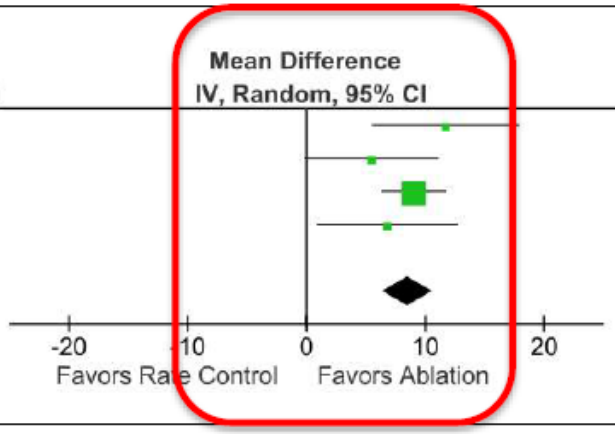
Metaanalýza 4 randomizovaných studií perzist FiS x AA medikace u HF n= 224

Change in left ventricular ejection fraction (LVEF)

A

Study or Subgroup	Ablation Mean	Ablation SD	Ablation Total	Rate Control Mean	Rate Control SD	Rate Control Total	Weight	Mean Difference IV, Random, 95% CI
Hunter 2014	8.1	12.5	26	-3.6	9.7	24	12.0%	11.70 [5.52, 17.88]
Jones 2013	10.9	11.5	24	5.4	8.5	26	14.3%	5.50 [-0.14, 11.14]
Khan 2008	8	8	41	-1	4	40	60.7%	9.00 [6.26, 11.74]
MacDonald 2011	8.2	12	20	1.4	5.9	18	13.0%	6.80 [0.88, 12.72]
Total (95% CI)			**111**			**108**	**100.0%**	**8.53 [6.40, 10.67]**

Heterogeneity: Tau² = 0.00; Chi² = 2.56, df = 3 (P = 0.46); I² = 0%
Test for overall effect: Z = 7.83 (P < 0.00001)

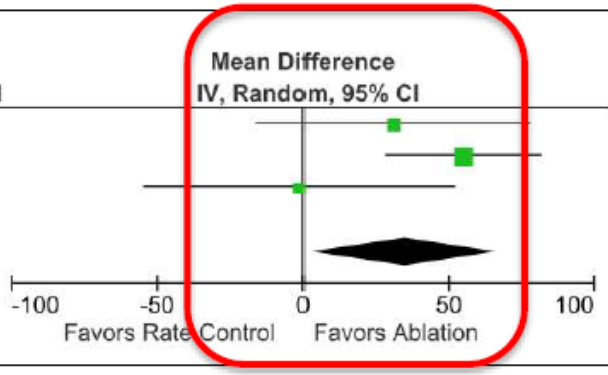


Change in 6-min walk test distance

C

Study or Subgroup	Ablation Mean	Ablation SD	Ablation Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
Jones 2013	21	103.7	26	-10	65.19	26	28.2%	31.00 [-16.08, 78.08]
Khan 2008	71	78.48	41	16	40.2	40	47.9%	55.00 [27.94, 82.06]
MacDonald 2011	20.1	76.5	17	21.4	77.4	15	23.9%	-1.30 [-54.75, 52.15]
Total (95% CI)			**84**			**81**	**100.0%**	**34.76 [2.87, 66.65]**

Heterogeneity: Tau² = 362.12; Chi² = 3.61, df = 2 (P = 0.16); I² = 45%
Test for overall effect: Z = 2.14 (P = 0.03)



Halabi et al JACC Clinical EP 2015

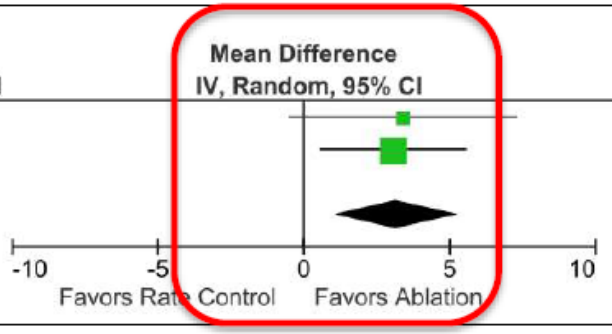
Metaanalýza 4 randomizovaných studií perzist FiS x AA medikace u HF n= 224

Change in peak oxygen consumption (VO2)

D

Study or Subgroup	Ablation Mean	Ablation SD	Ablation Total	Rate Control Mean	Rate Control SD	Rate Control Total	Weight	Mean Difference IV, Random, 95% CI
Hunter 2014	1.4	7.05	26	-2	7.1	24	29.1%	3.40 [-0.53, 7.33]
Jones 2013	2.13	5.52	24	-0.94	3.13	26	70.9%	3.07 [0.56, 5.58]
Total (95% CI)			50			50	100.0%	3.17 [1.05, 5.28]

Heterogeneity: Tau² = 0.00; Chi² = 0.02, df = 1 (P = 0.89); I² = 0%
Test for overall effect: Z = 2.93 (P = 0.003)

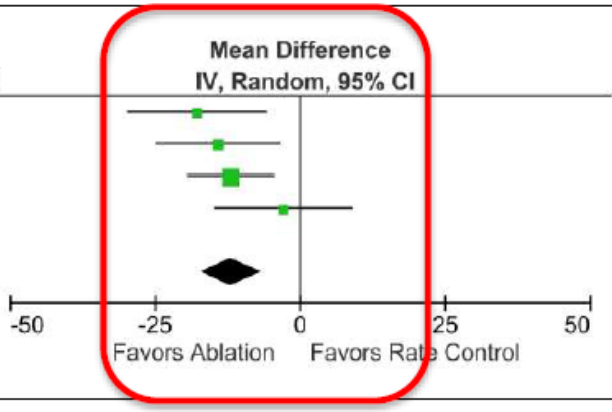


Change in Minnesota Living With Heart Failure (MLWHF)

B

Study or Subgroup	Ablation Mean	Ablation SD	Ablation Total	Rate Control Mean	Rate Control SD	Rate Control Total	Weight	Mean Difference IV, Random, 95% CI
Hunter 2014	-18	21.99	26	-0.2	21.47	24	17.9%	-17.80 [-29.85, -5.75]
Jones 2013	-19.58	22.32	24	-5.35	15.71	26	22.0%	-14.23 [-25.01, -3.45]
Khan 2008	-19	21	41	-7	12.59	40	41.8%	-12.00 [-19.52, -4.48]
MacDonald 2011	-5.7	19.7	20	-2.8	17.9	18	18.2%	-2.90 [-14.85, 9.05]
Total (95% CI)			111			108	100.0%	-11.88 [-17.15, -6.60]

Heterogeneity: Tau² = 2.57; Chi² = 3.28, df = 3 (P = 0.35); I² = 8%
Test for overall effect: Z = 4.41 (P < 0.0001)



Halabi et al JACC Clinical EP 2015

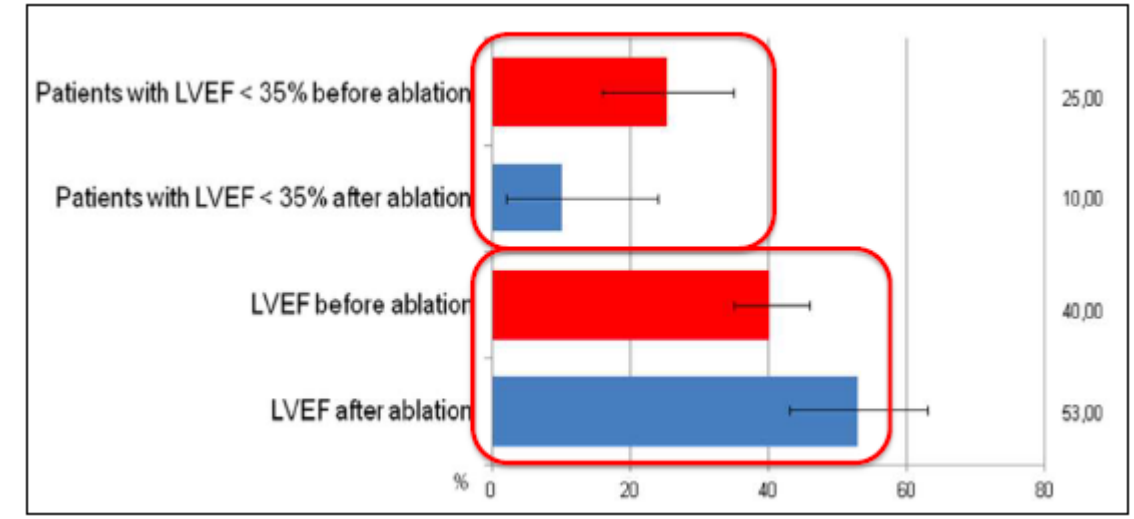
Metaanalýza 23 studií perzist FiS x AA medikace u HF n= 1838, FUP 23měs

Circulation
Arrhythmia and Electrophysiology

American Heart Association.

Catheter Ablation of Atrial Fibrillation in Patients With Left Ventricular Systolic Dysfunction: A Systematic Review and Meta-Analysis

Matteo Anselmino, Mario Matta, Fabrizio D'Ascenzo, T. Jared Bunch, Richard J. Schilling, Ross J. Hunter, Carlo Pappone, Thomas Neumann, Georg Noelker, Martin Fiala, Emanuele Bertaglia, Antonio Frontera, Edward Duncan, Chrishan Nalliah, Pierre Jais, Rukshen Weerasooriya, Jon M. Kalman and Fiorenzo Gaita



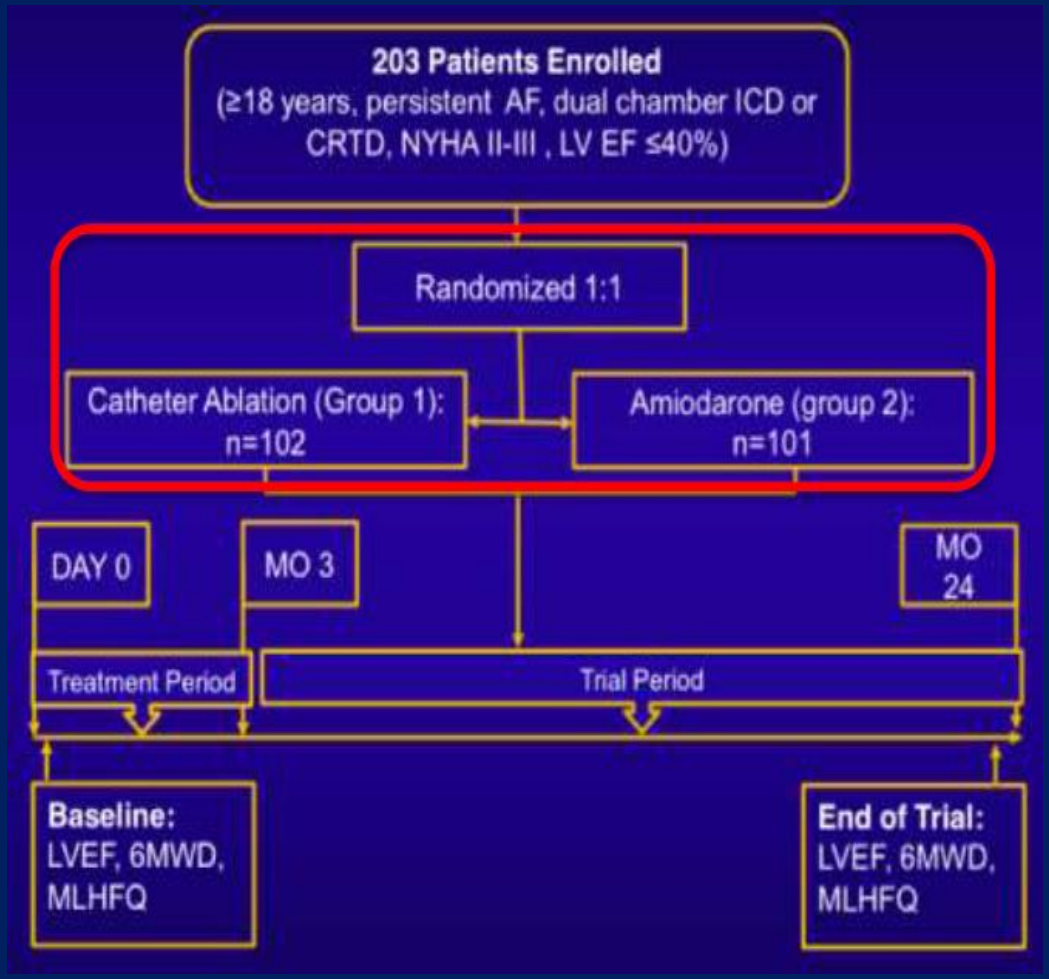
Mortalitní randomizovaná studie Ablace Perzist FiS x amiodarone (AATAC)

- Multicent, 2D-ICD, CRT-D, EF pod 40%,
- RMT 102:102 pts

Prim cíl: AF rekurence

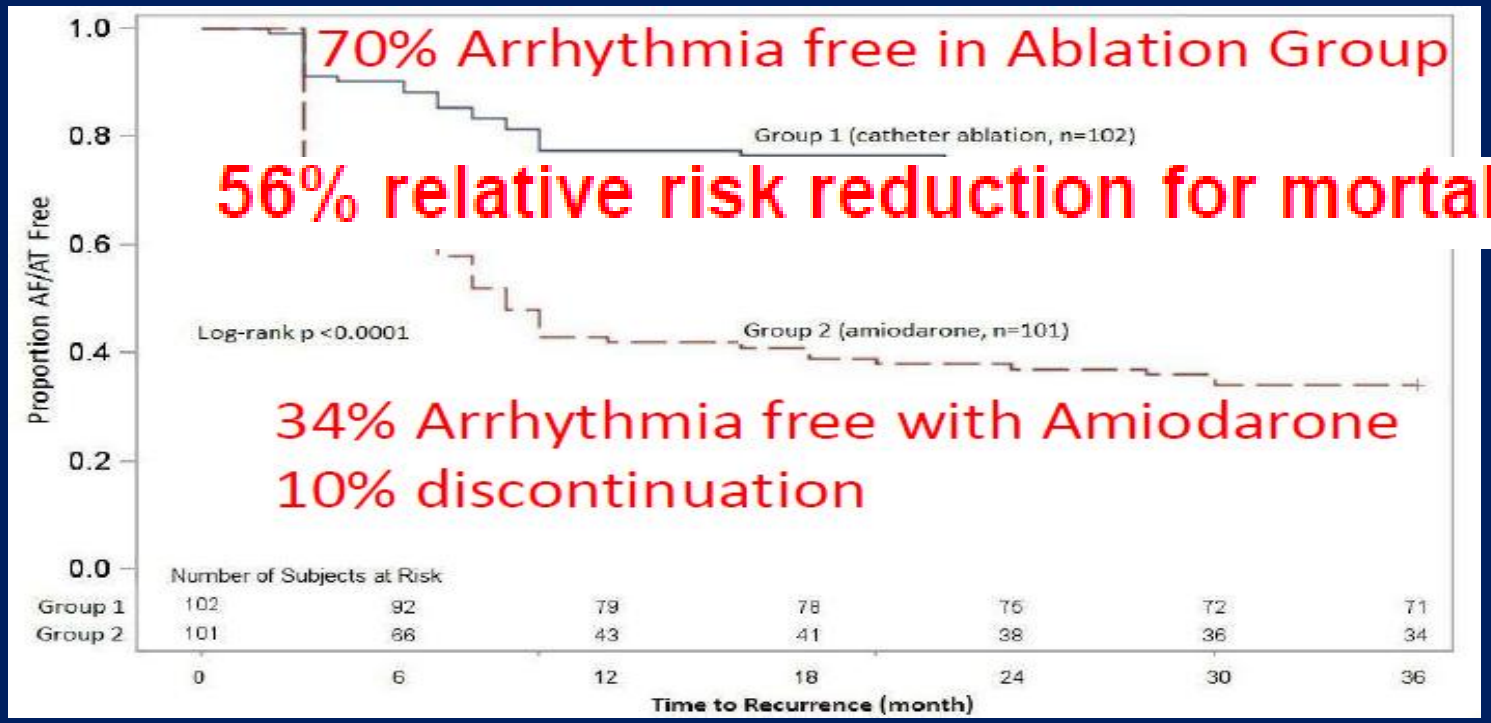
Sek cíl: mortalita, Hospitalizace,6minWD MLHFQ

FUP 24měs



Di Biase et al. Circulation 2016

Mortalitní randomizovaná studie Ablace Perzist FiS x amiodarone (AATAC)



	No Recurrence (n= 91)		Recurrence (n= 86)		P (comparing change between groups)
	Baseline	Change (median)	Baseline	Change (median)	
LVEF (%)	28.8±10	9.6±7.4 (9.4)	30.2±9	4.2±6.2 (4.0)	<0.001
6MWD (meter)	347±113	27±38 (24)	352±128	8±42 (2)	<0.001
MLHFQ	53±24	-14±18 (-12)	49±26	-2.9±15 (-2.2)	<0.001

Di Biase et al. Circulation 2016

6-leté výsledky ablace FiS EF<45%

Six-Year Clinical Outcomes After Catheter Ablation of Atrial Fibrillation in Patients With Impaired Left Ventricular Function

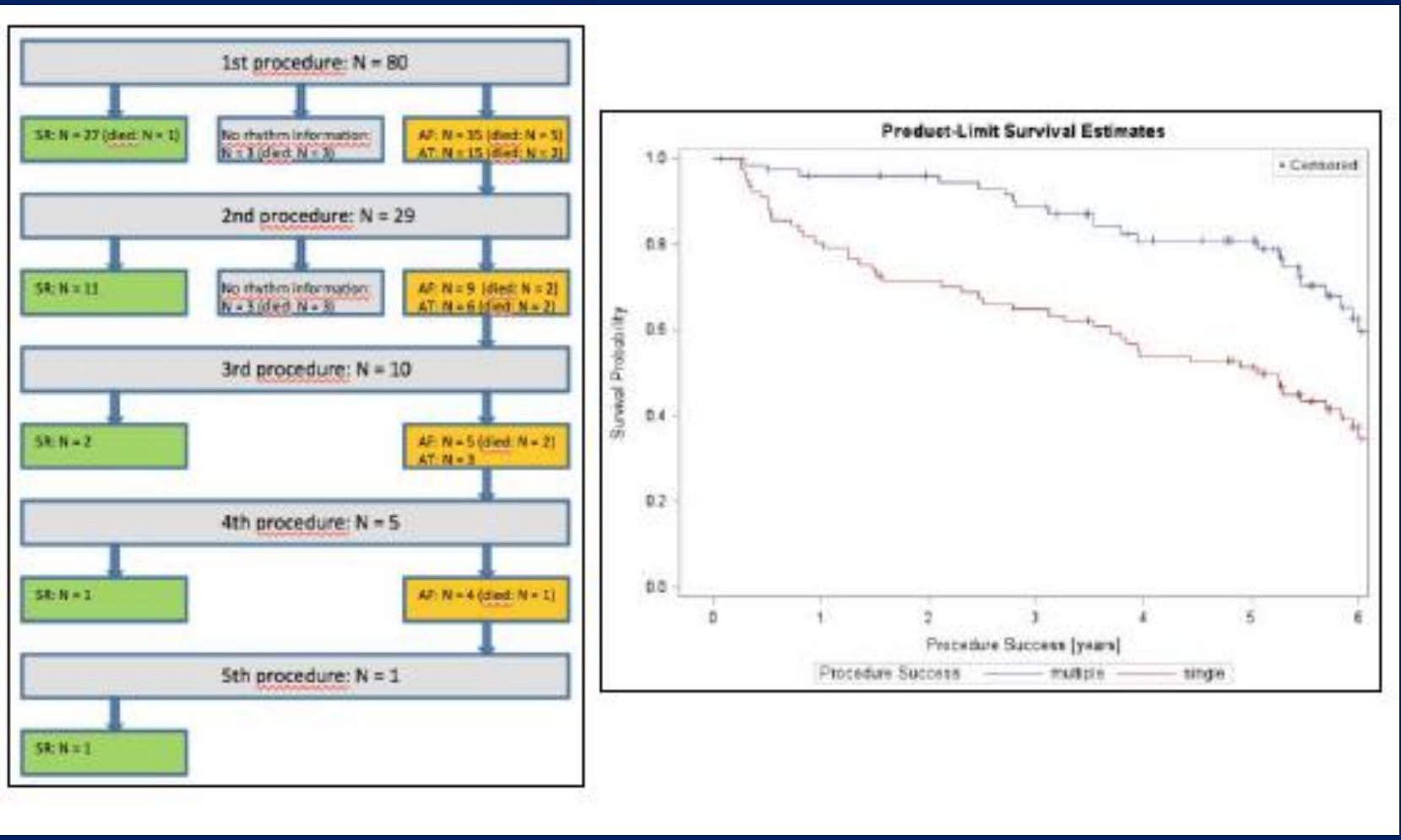
ANDREAS RILLIG, M.D.,* HISAKI MAKIMOTO, M.D.,* JASCHA WEGNER,* TINA LIN, M.B.B.S., B.MED SCI., F.R.A.C.P.,* CHRISTIAN HEEGER, M.D.,* CHRISTINE LEMES, M.D.,* THOMAS FINK, M.D.,* ANDREAS METZNER, M.D.,* ERIK WISSNER, M.D.,* SHIBU MATHEW, M.D.,* PETER WOHLMUTH,† KARL-HEINZ KUCK, M.D.,* ROLAND RICHARD TILZ, M.D.,* and FEIFAN OUYANG, M.D.*

From the *Department of Cardiology, Asklepios Klinik St. Georg, Hamburg, Germany; and †Asklepios Proresearch, Hamburg, Germany

- N= 80 ,
- Parox 20%, perzist 46%, dlouhod. perzist 33%
- ICHS, DKMP, tachyKMP
- FUP median 72m (67-75), Holter EKG, KS/ICD

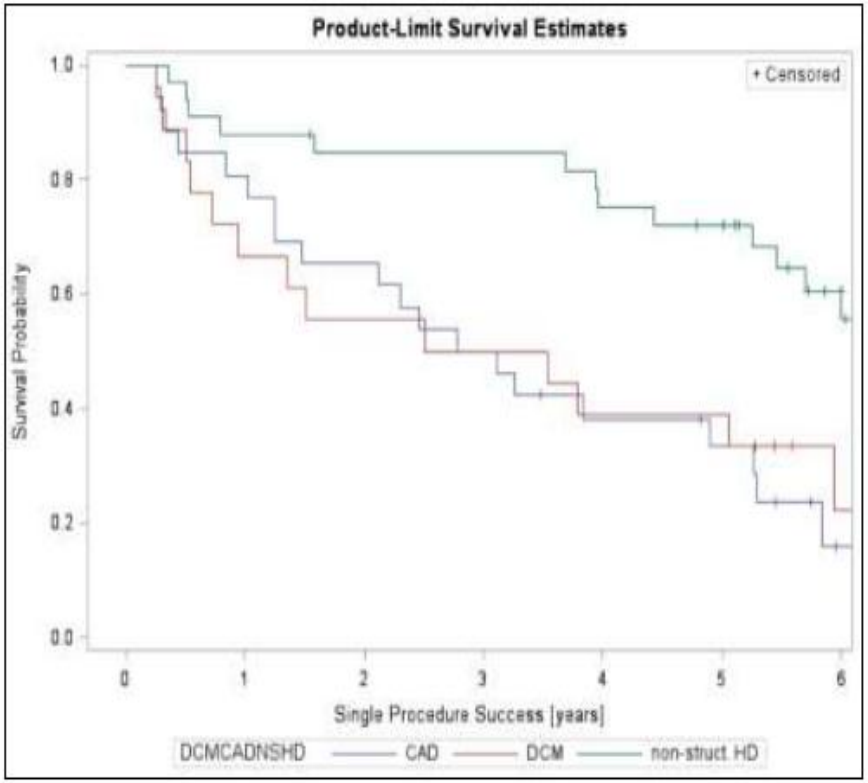
Rillig et al. *J Cardiovasc Electrophysiol, 2015*

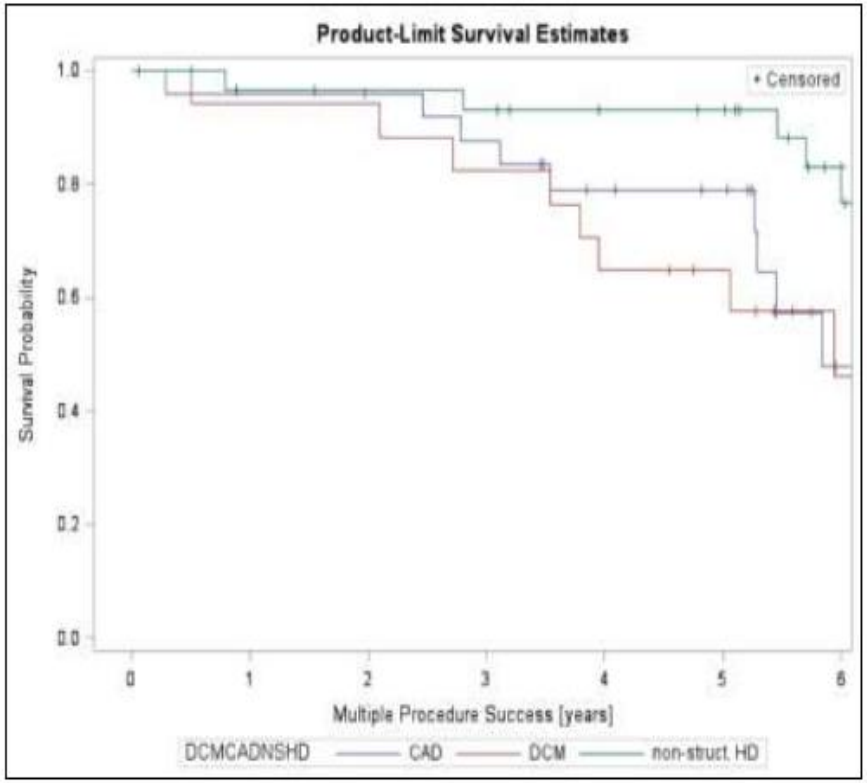
6-leté výsledky ablace FiS EF < 45%



Rillig et al. *J Cardiovasc Electrophysiol, 2015*

6-leté výsledky ablace FiS EF<45%

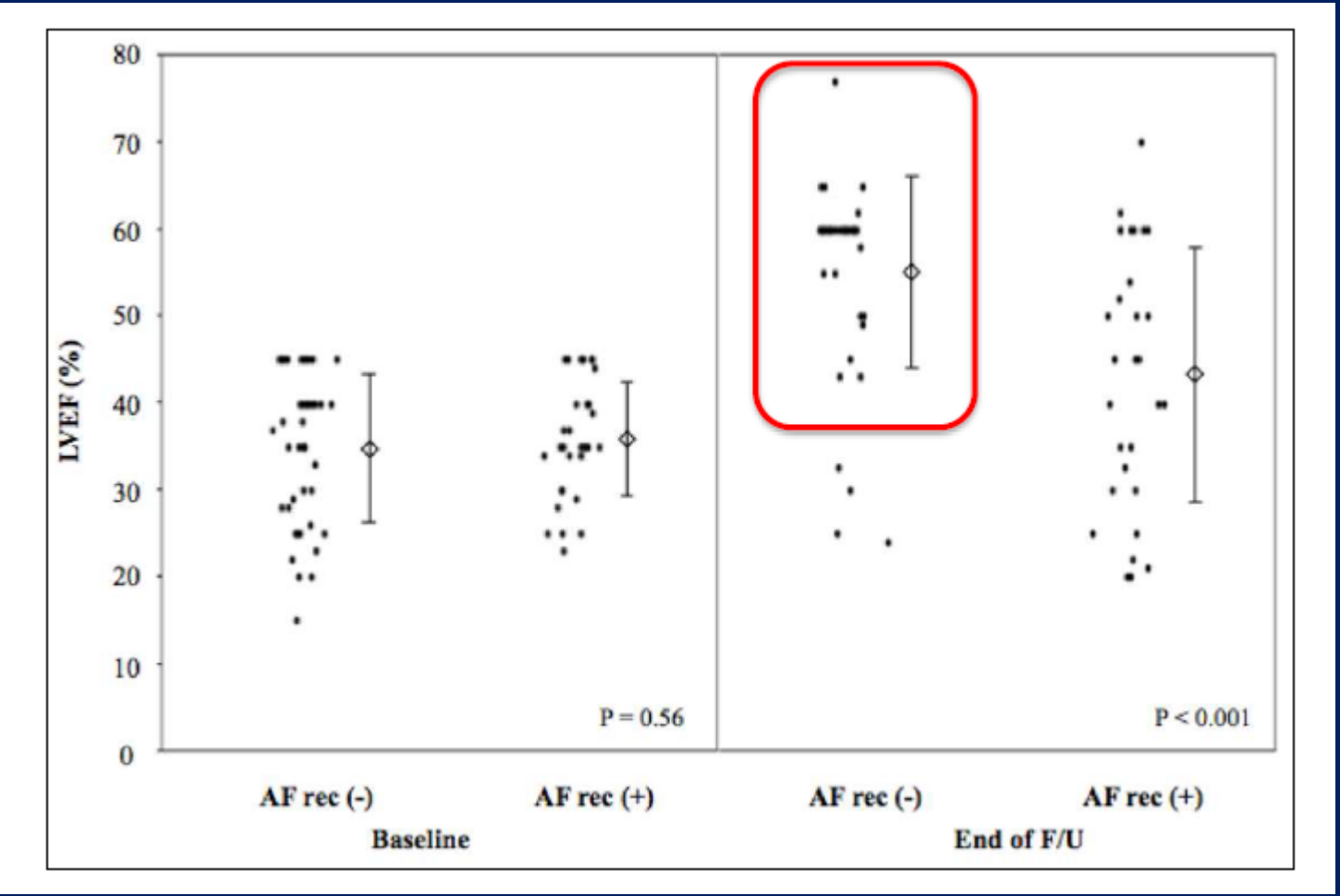




Rillig et al. *J Cardiovasc Electrophysiol, 2015*

6-leté výsledky ablace FiS EF < 45%

Statisticky významné zlepšení EFLK, p<0.001

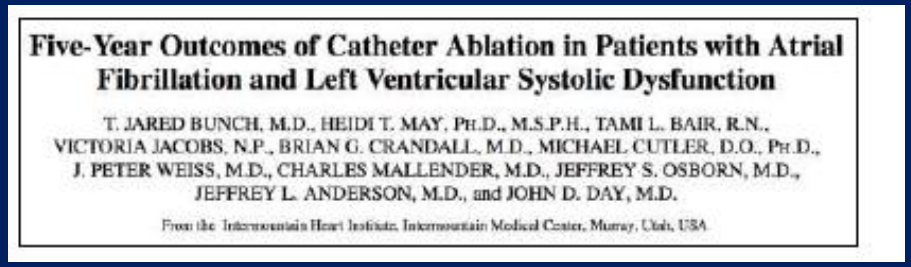


Rillig et al. *J Cardiovasc Electrophysiol, 2015*

5 letá mortalita a CMP po první ablaci FiS u srdečního selhání

- Srovnání 3 skupin 1:4:4 s věkovou korelací
- 1. HF-FiS první RFA n=267
- 2. HF-FiS bez RFA n=1068
- 3. HF bez FiS n=1068

- EF < 35%
- Prim cíl: celk.mortalita, CMP, EFLK-NYHA, recid FiS



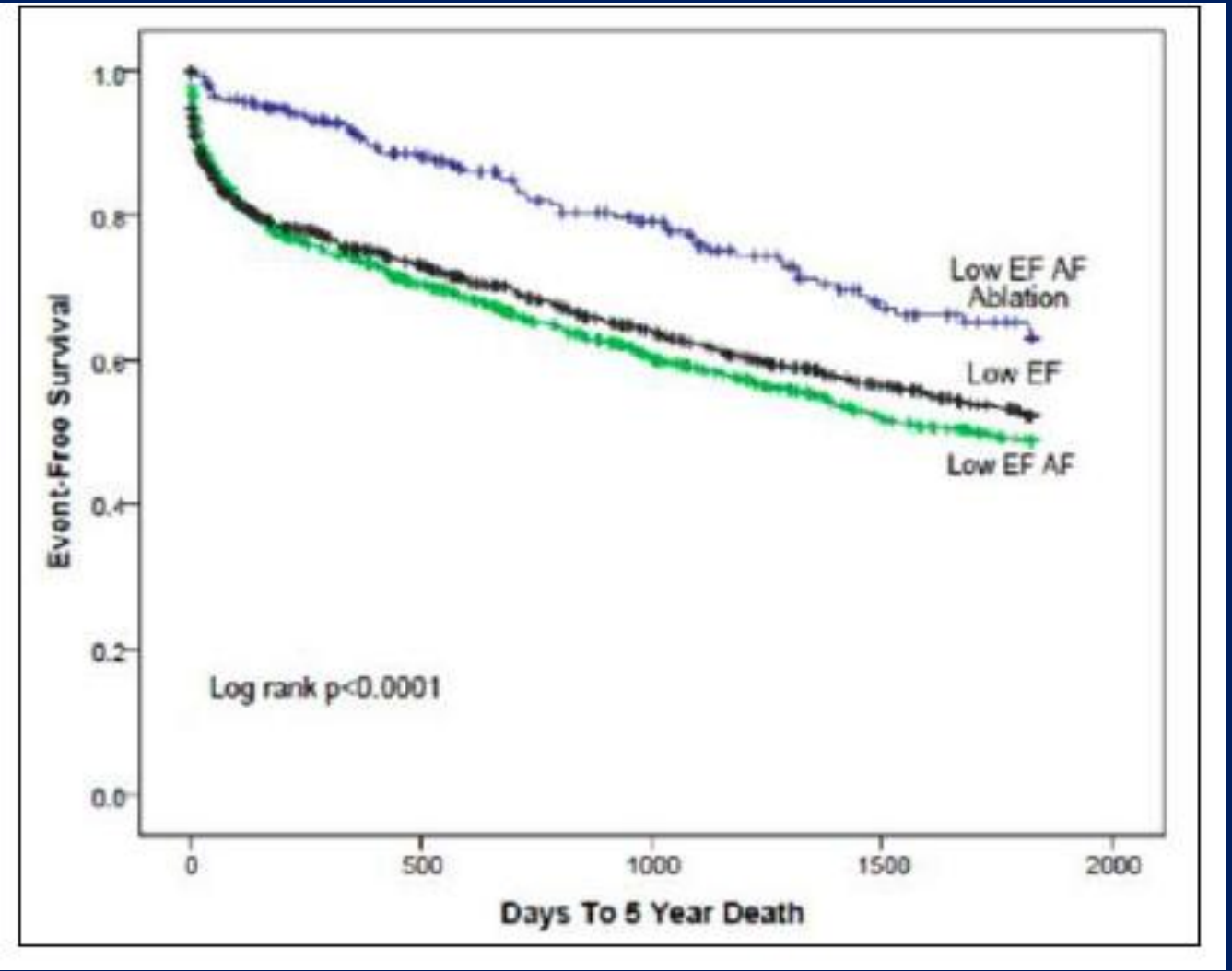
Five-Year Outcomes of Catheter Ablation in Patients with Atrial Fibrillation and Left Ventricular Systolic Dysfunction

T. JARED BUNCH, M.D., HEIDI T. MAY, PH.D., M.S.P.H., TAMI L. BAIR, R.N., VICTORIA JACOBS, N.P., BRIAN G. CRANDALL, M.D., MICHAEL CUTLER, D.O., PH.D., J. PETER WEISS, M.D., CHARLES MALLENDER, M.D., JEFFREY S. OSBORN, M.D., JEFFREY L. ANDERSON, M.D., and JOHN D. DAY, M.D.

From the Intermountain Heart Institute, Intermountain Medical Center, Murray, Utah, USA

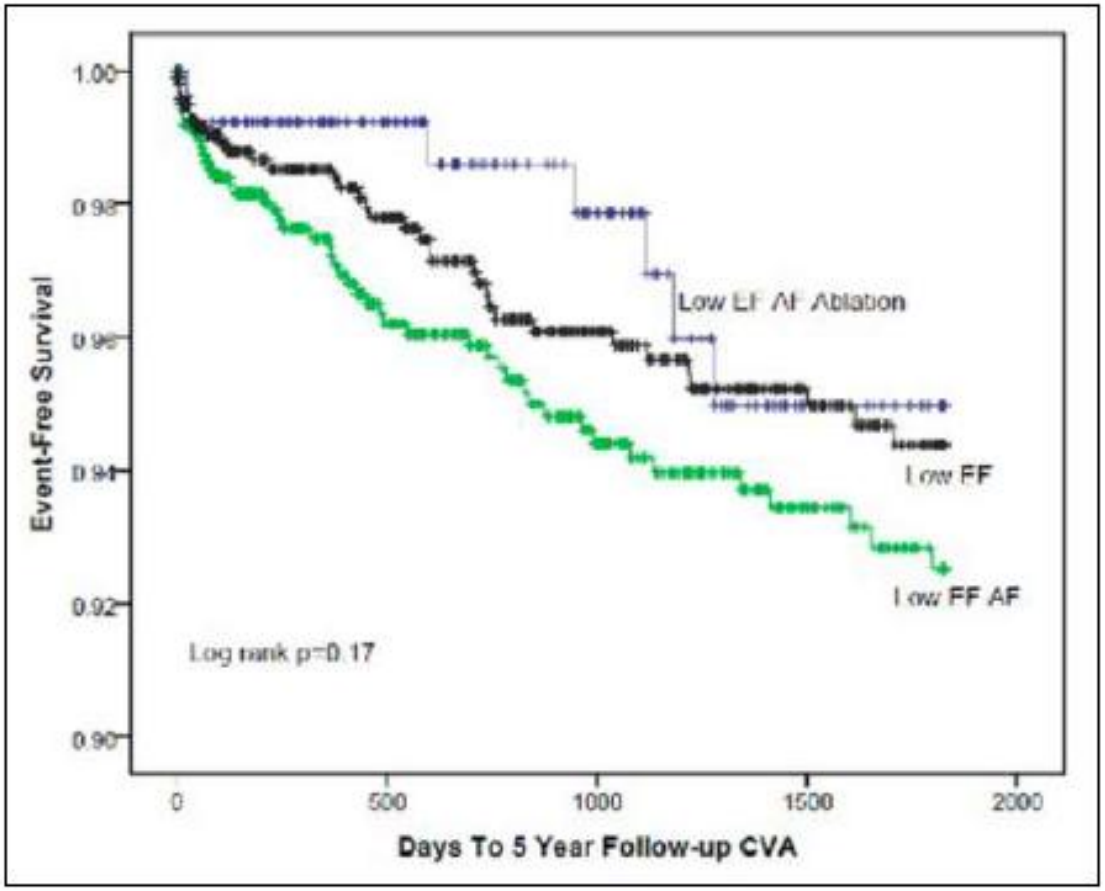
Bunch et al. *J Cardiovasc Electrophysiol* 2015

5 letá mortalita po první ablaci FiS u srdečního selhání



Bunch et al. *J Cardiovasc Electrophysiol* 2015

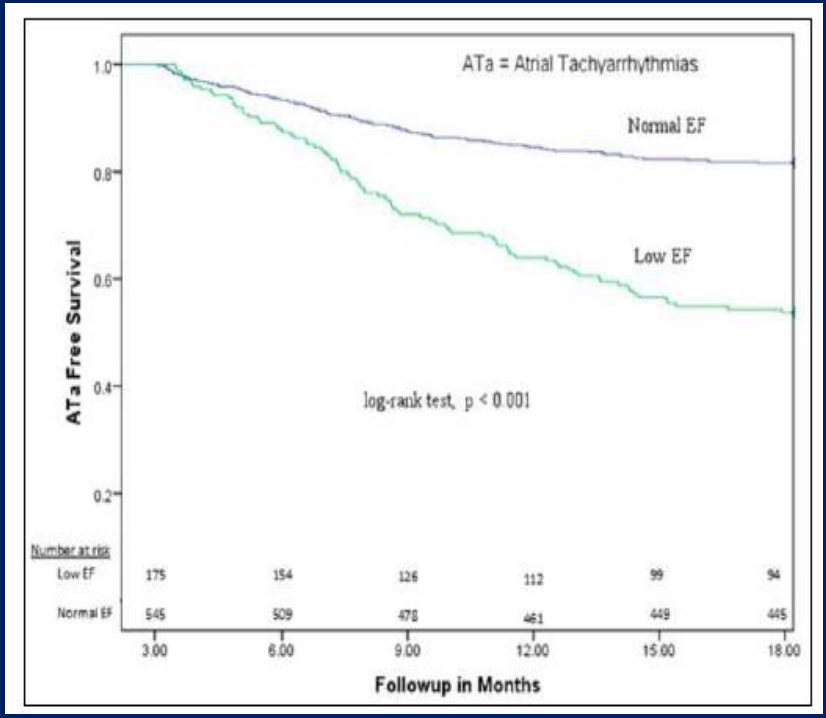
5 letý výskyt CMP po ablaci FiS u srdečního selhání

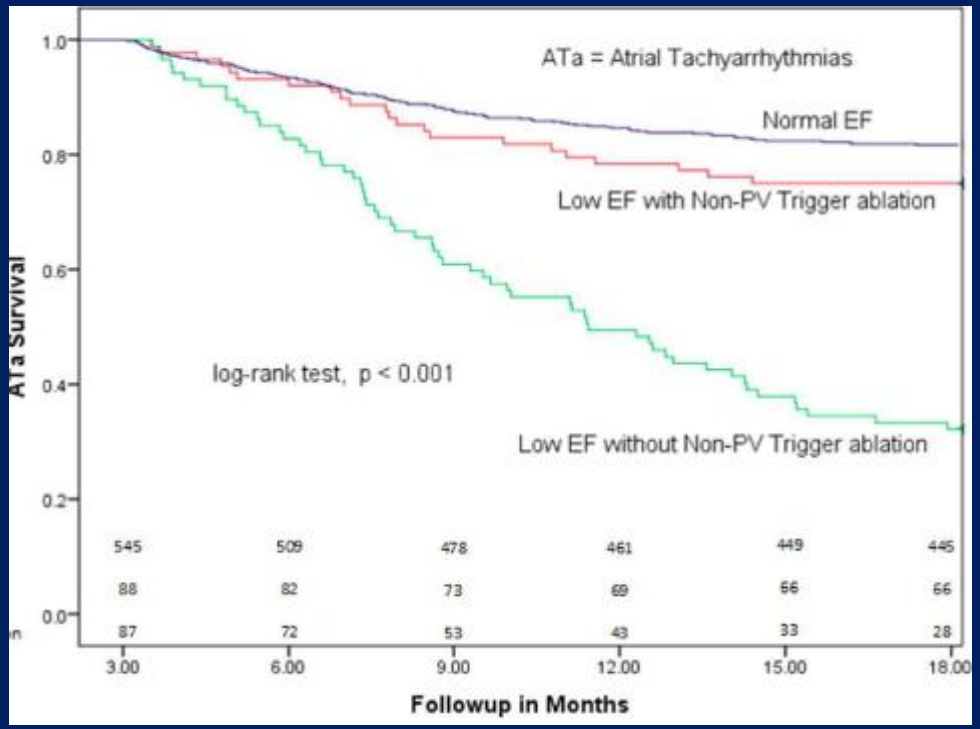


Bunch et al. *J Cardiovasc Electrophysiol* 2015

Jak zlepšit úspěšnost ablace FiS u srdečního selhání ?

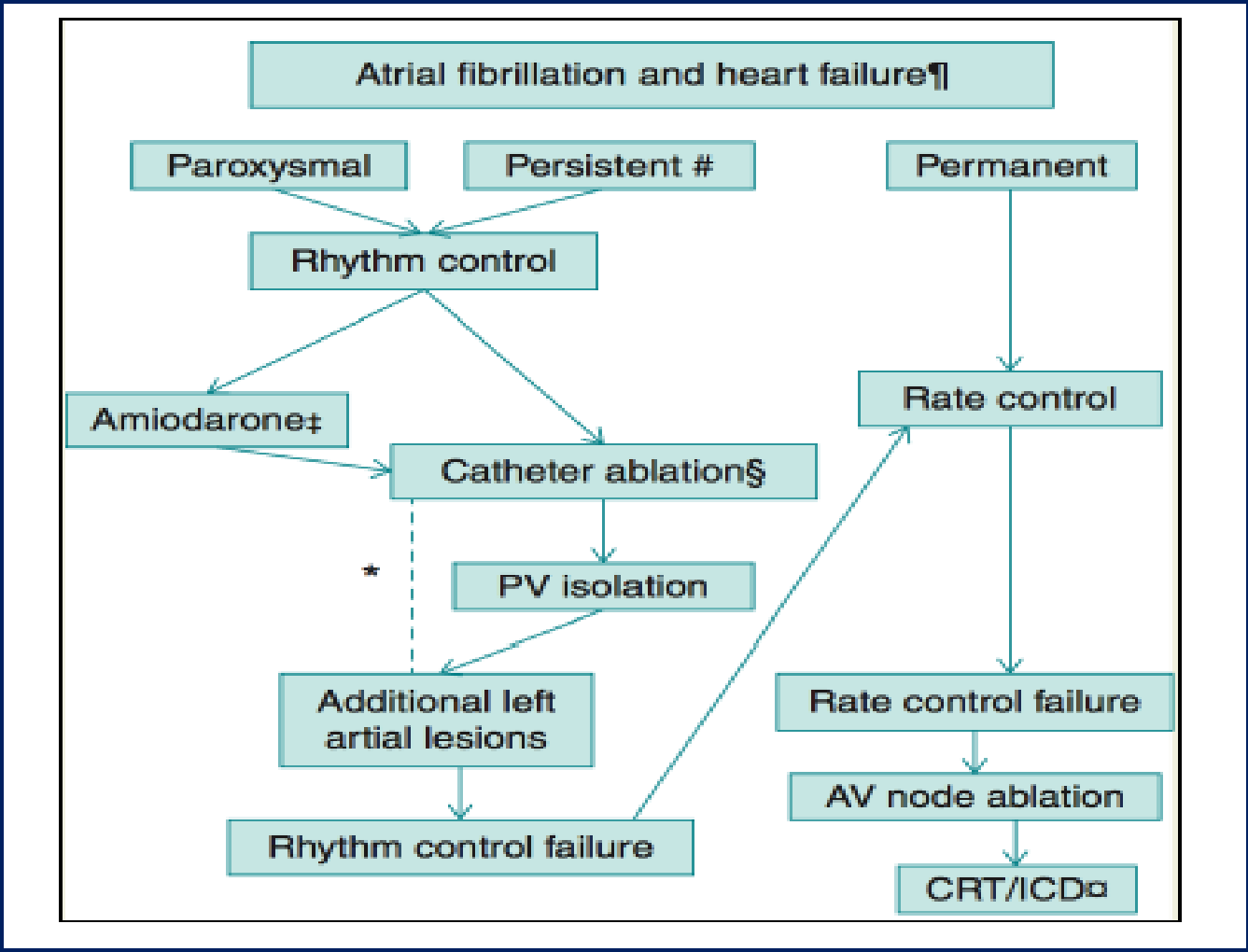
Ablace extrapulmonálních spouštěčů FiS





Zhao et al. Heart Rhythm 2016

Algoritmus co s FiS u srd. selhání



Anselmino et al Europace 2016

Závěr

- Cílenou katetrizační ablací fibrilace síní u srdečního selhání lze očekávat významné zlepšení kvality života, fyzické výkonnosti, redukce CMP, významný nárůst EF LK a významný mortalitní benefit.

- Optimálních výsledků lze dosáhnout komplexním – individuálním přístupem (extrapulmonální spouštěče, terminace FiS ablací, noninducibilita).

- Rozvaha o implantaci CRT-D případně s neselektivní ablací AV junkce by měla být zvažována až ve druhé době po vyhodnocení ev. neúspěchu primární strategie

Role katetrizační ablace fibrilace síní v léčbě srdečního selhání

Jan Škoda

Nemocnice Na Homolce