Kazuistické sympozium - širší efekty katetrizační ablace

PACIENT S CRT A FS

(PACIENT SE SRDEČNÍM SELHÁNÍM A FS)

Jan Petrů

Nemocnice Na Homolce, Praha

KardioCentrum

AHA/ACC/HRS AF guidelines 2016 – indikace k ablaci

- **Paroxysmální** fibrilace síní
  - Symptomatická FS, po selhání AA (I/A)
  - Symptomatická FS, první volba (IIa/B)

jednoznačná indikace

- **Perzistující** fibrilace síní
  - Symptomatická FS, po selhání AA (IIa/C)

vhodná indikace

- **Dlouhodobě** perzistující fibrilace síní
  - Symptomatická FS, po selhání AA (IIa/C)

vhodná indikace

Podmínka: provedení ablace ve zkušeném centru

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Indikace k ablaci ??

- U obézních pacientů …. limit BMI ??
- U pacientů nad 80 let ??
- U nemocných se srdečním selháním/nízkou EF LK ??

FS negativně ovlivňuje mortalitu pacientů se srdečním selháním:

Hemodynamický efekt

Riziko tromboembolie

Nežádoucí účinky antiarytmik, antikoagulace či katetrizační ablace

FS negativně ovlivňuje mortalitu pacientů se srdečním selháním:

Hemodynamický efekt

Riziko tromboembolie

Nežádoucí účinky antiarytmik, antikoagulace či katetrizační ablace

Nutno rozlišovat

- Tachykardií indukovaná KMP
- Srdeční selhání jiné etiologie s přidruženou FS

AF ablation should be considered in symptomatic patients with AF and heart failure with reduced ejection fraction to improve symptoms and cardiac function when tachycardiomyopathy is suspected.	IIa	C

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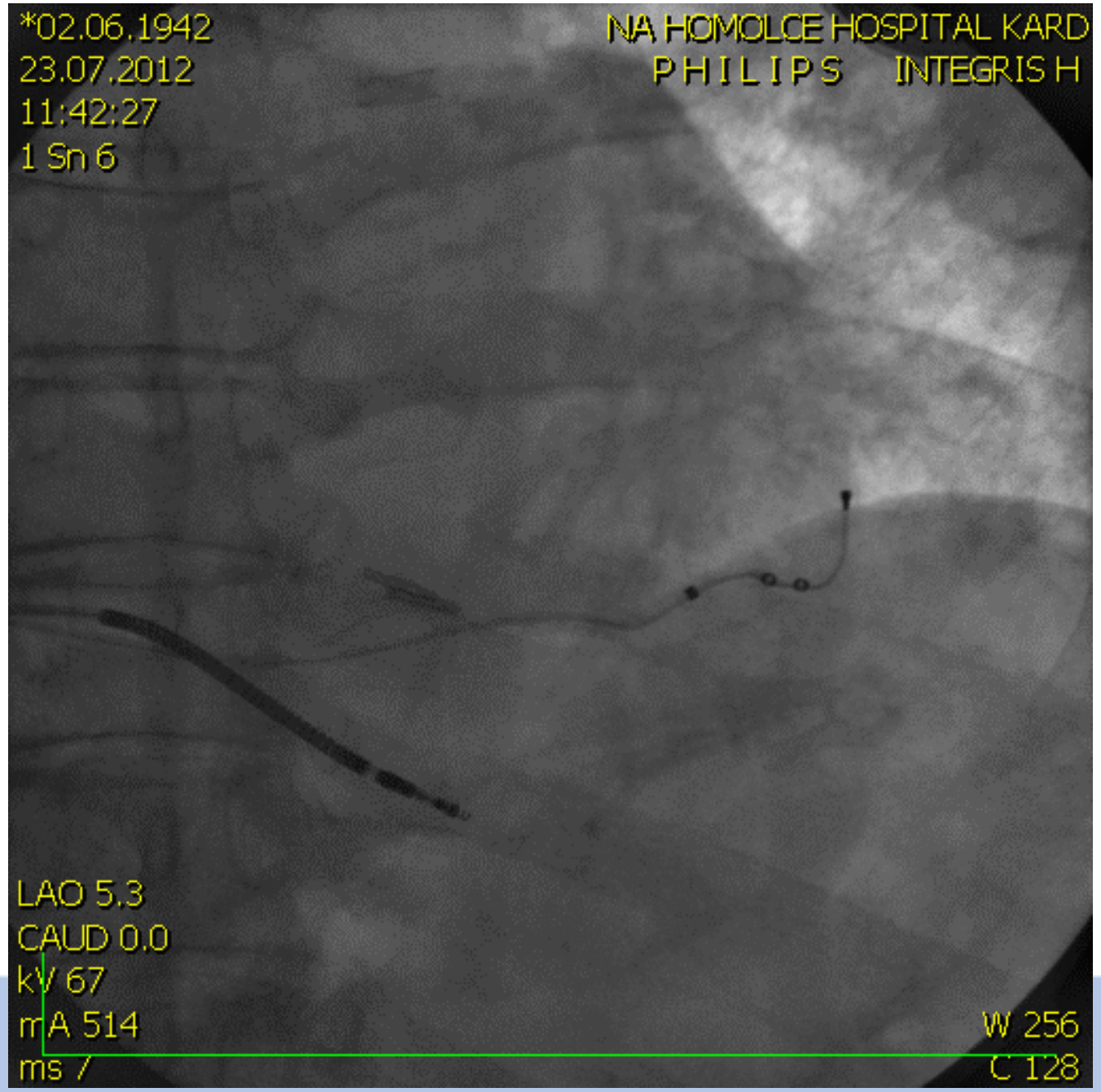
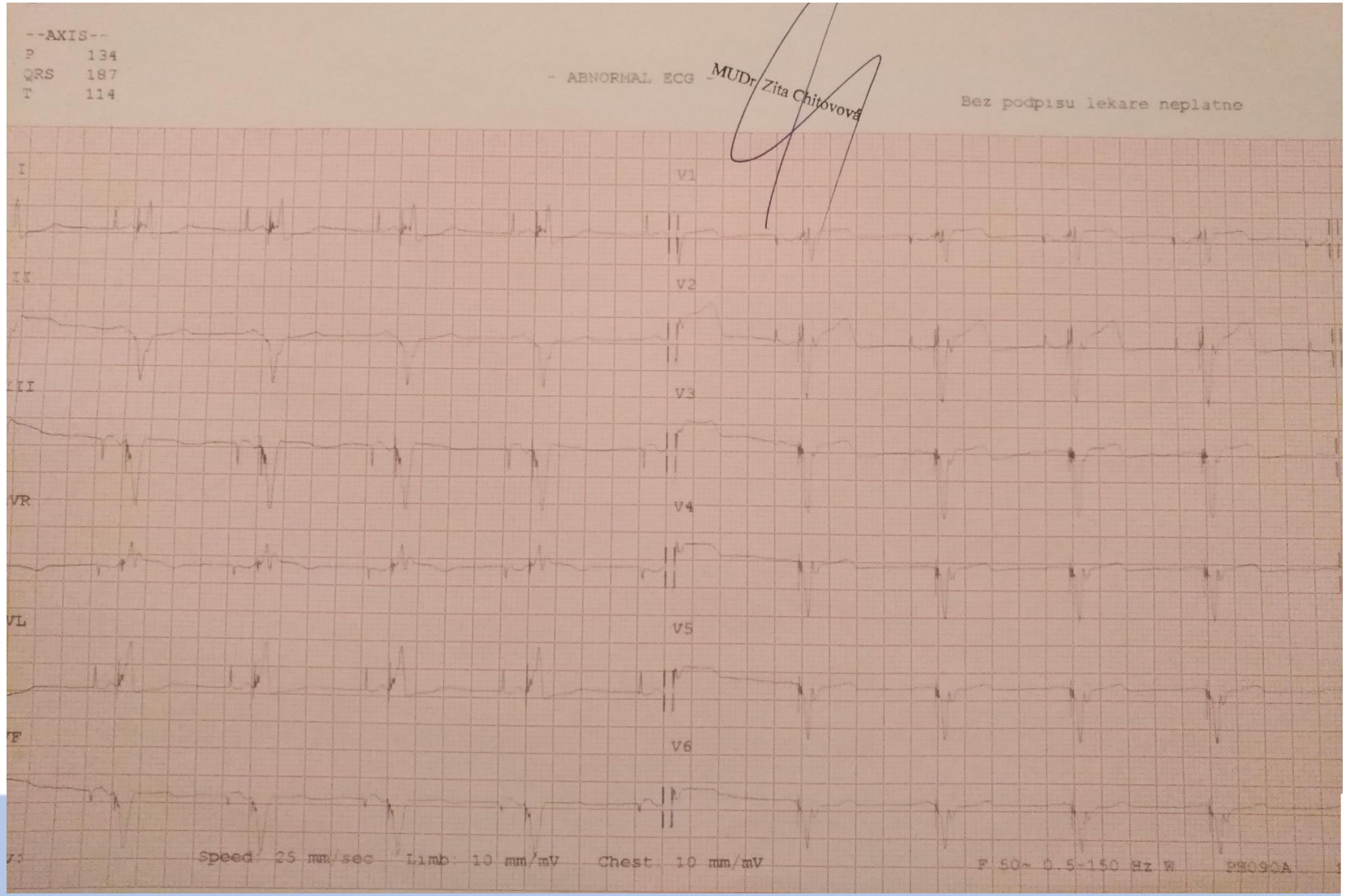
Kazuistika 1

- 70 letý muž, po STEMI přední stěny 1988, PCI RIA a ACD 1998
- 7/2012 - NYHA II-III.st.
- LBBB, QRS 170ms
- ECHO: dilatace LK, EF 15%, aneuryzma hrotu, akineza baze spodní stěny, LS 51mm, střední MI reg.
- implantace CRTD


*02.06.1942
23.07.2012
11:42:27
1 Sn 6
NA HOMOLCE HOSPITAL KARD
PHILIPS INTEGRIS H
LAO 5.3
CAUD 0.0
kV 67
mA 514
ms /
W 256
C 128


--AXIS--
P 134
QRS 187
T 114
- ABNORMAL ECG
MUDr Zita Chitovová
Bez podpisu lekare neplatne
I
II
III
VR
VL
VF
V1
V2
V3
V4
V5
V6
Speed 25 mm/sec Limb 10 mm/mV Chest 10 mm/mV
F 50~ 0.5-150 Hz W PM90A

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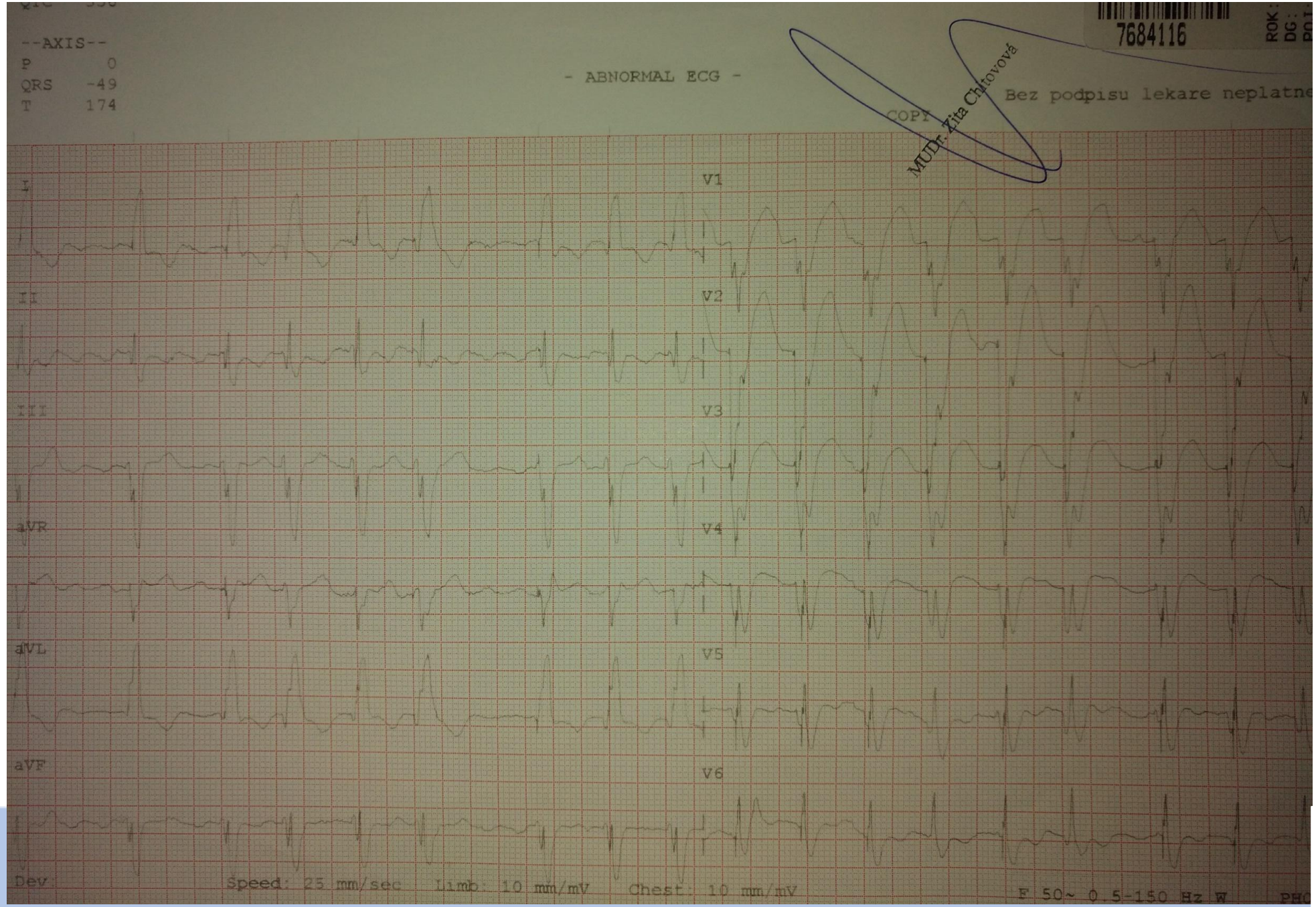

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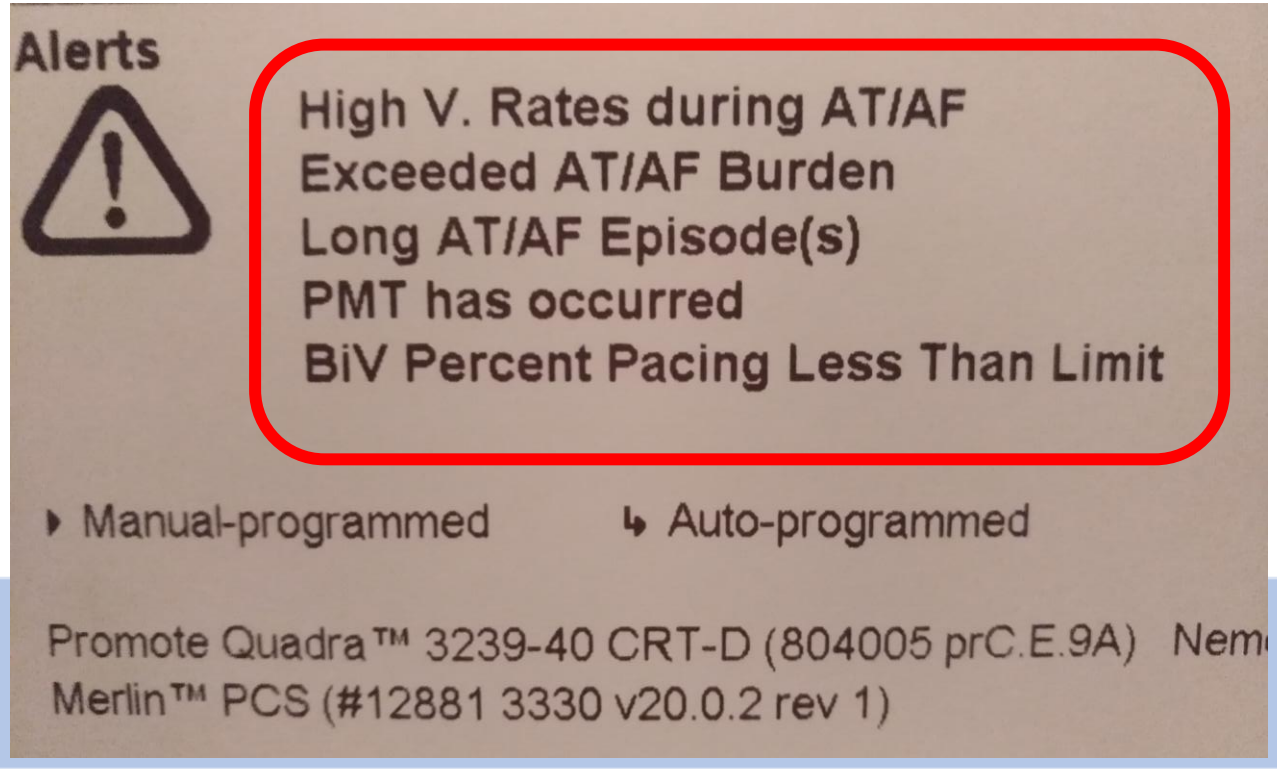
- implantace CRTD
- 10/2012 – první záchyt perzist. fibrilace síní, NYHA III-IV, NTproBNP 3099 pg/ml
- Hospitalizace: nasazen amiodarone, el. kardioverze
- Při dalších kontrolách zlepšení EF LK na 30%, NYHA II

Kazuistika 1

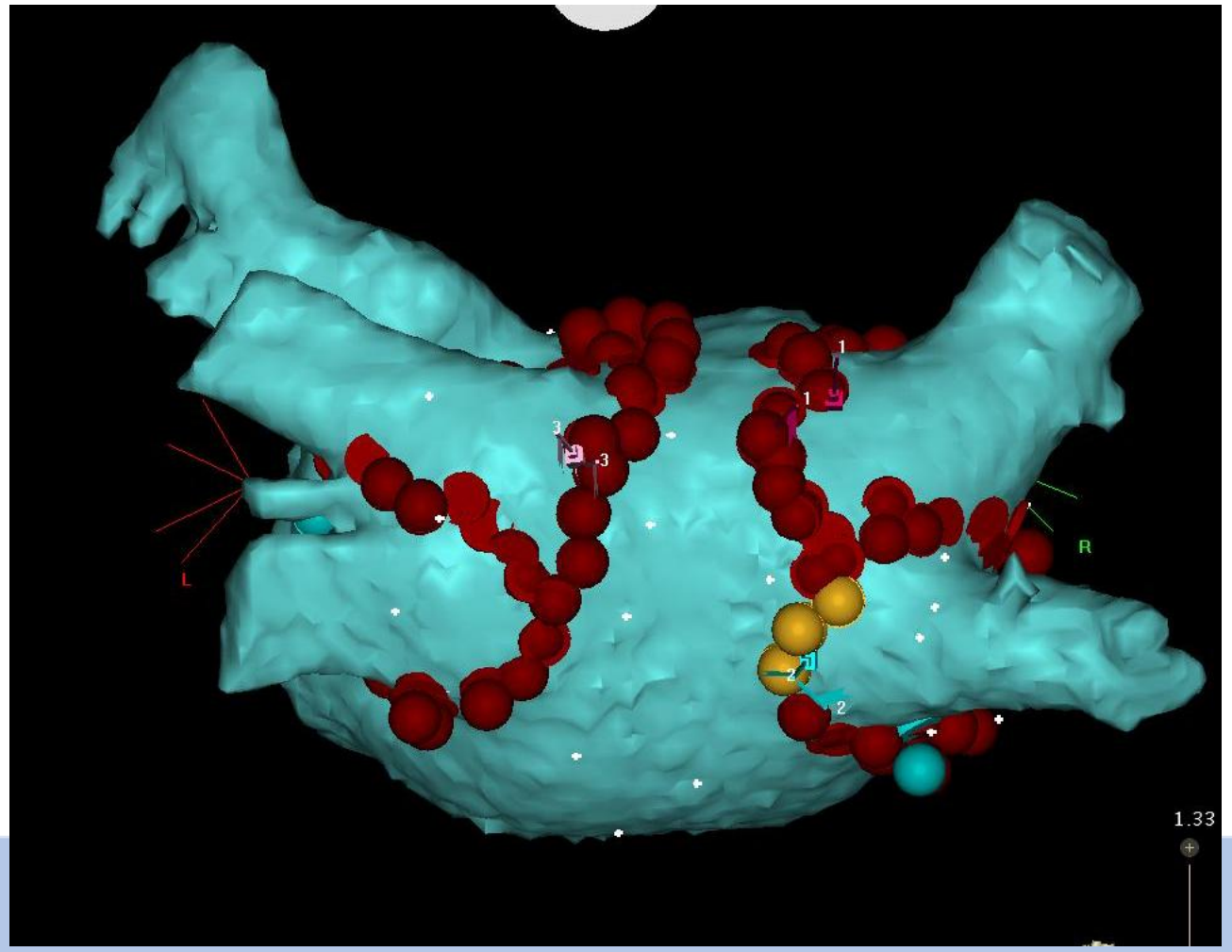
- 2014 - thyreopatie, vysazení amiodaronu

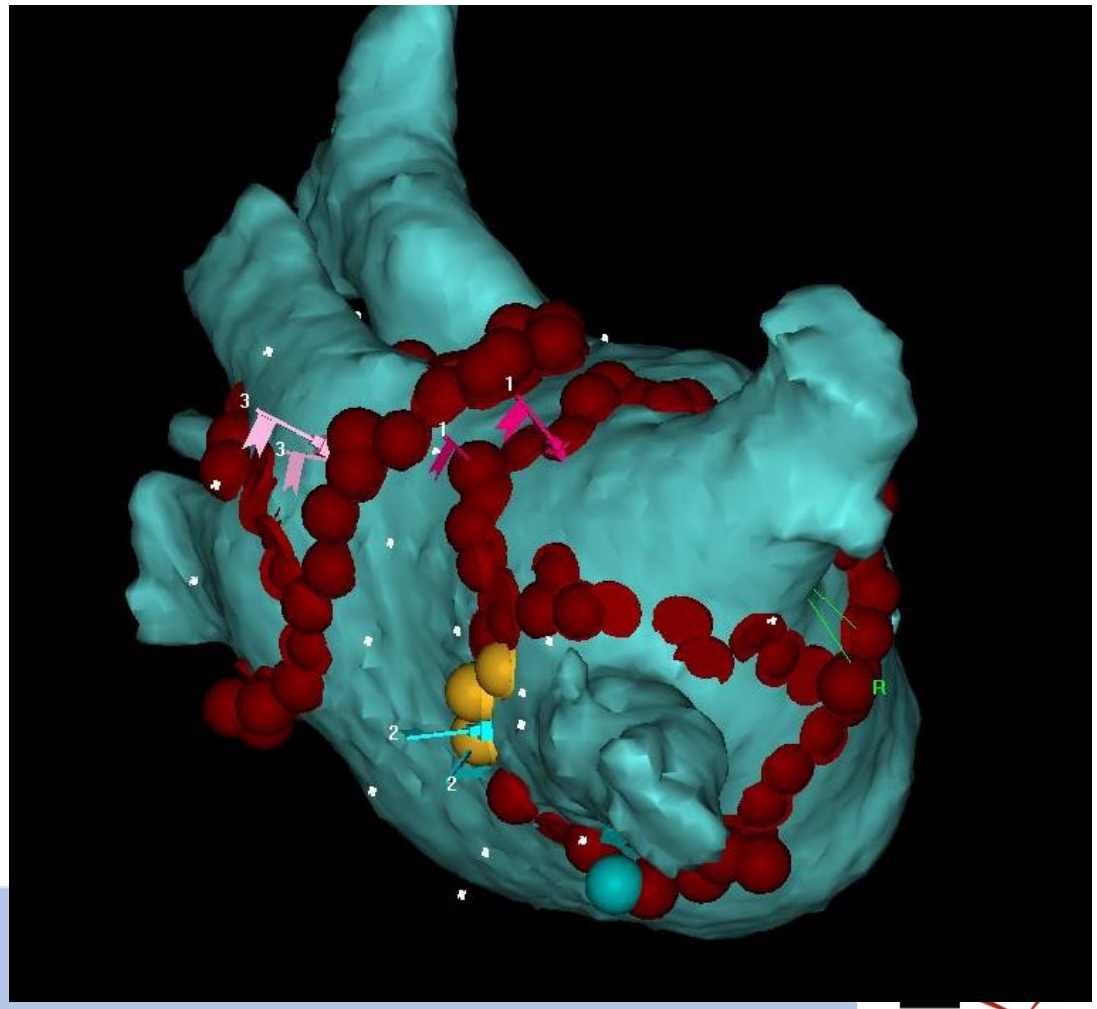
Kazuistika 1

- 2014 - thyreopatie, vysazení amiodaronu
- 12/2015 – progrese srd. selhání, SKG – konzervat. postup



RF izolace plicních žil (1/2016)





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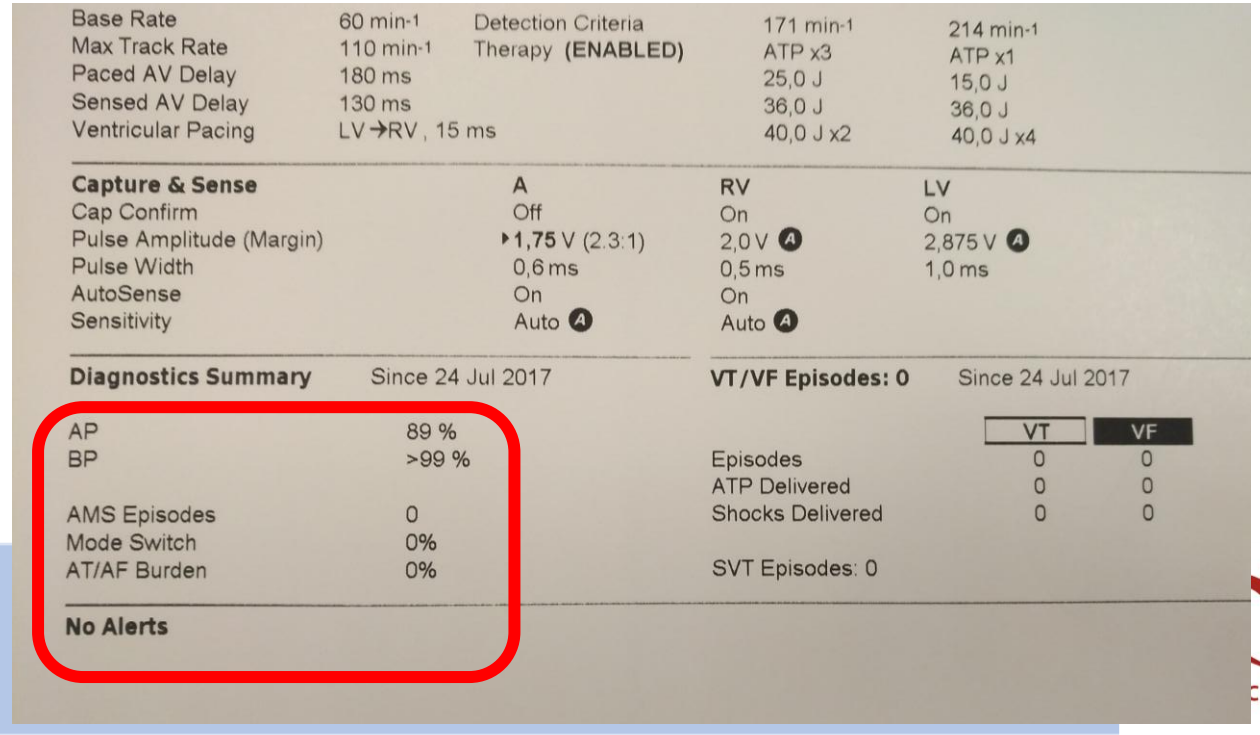
Kazuistika 1

- Od ablace v 1/2016: NYHA II, AF burden 0%, BP > 99%
- 7/2017 recidiva FS, el. kardioverze
- Reablace - reizolace levých plicních žil

Kazuistika 1

- Od ablace v 1/2016: NYHA II, AF burden 0%, BP > 99%
- 7/2017 recidiva FS, el. kardioverze
- Reablace - reizolace levých plicních žil

- Poslední kontrola 2/2018
- 76 let, NYHA II



Base Rate	60 min-1	Detection Criteria	171 min-1	214 min-1
Max Track Rate	110 min-1	Therapy (ENABLED)	ATP x3	ATP x1
Paced AV Delay	180 ms		25,0 J	15,0 J
Sensed AV Delay	130 ms		36,0 J	36,0 J
Ventricular Pacing	LV→RV , 15 ms		40,0 J x2	40,0 J x4

Capture & Sense	A	RV	LV
Cap Confirm	Off	On	On
Pulse Amplitude (Margin)	1,75 V (2.3:1)	2,0 V A	2,875 V A
Pulse Width	0,6 ms	0,5 ms	1,0 ms
AutoSense	On	On	
Sensitivity	Auto A	Auto A	

Diagnostics Summary Since 24 Jul 2017

AP	89 %
BP	>99 %
AMS Episodes	0
Mode Switch	0%
AT/AF Burden	0%

No Alerts

VT/VF Episodes: 0 Since 24 Jul 2017

	VT	VF
Episodes	0	0
ATP Delivered	0	0
Shocks Delivered	0	0

SVT Episodes: 0

„Sinus rhythm matters in patients with a reduced EF“

- **ARC-HF** (Catheter Ablation Versus Medical Rate Control for Atrial Fibrillation in Patients With Heart Failure)
- **CAMTAF** (Catheter Ablation Versus Medical Treatment of Atrial Fibrillation in Heart Failure)
  - Obě studie prokázali signif. zlepšení funkční kapacity a QoL ve skupině ablace oproti rate kontrol
  - CAMTAF prokázala signif. zlepšení EF LK po 6 měsících ve skupině ablace (+8.1 [95% CI, 3.0–13.1] versus –3 [95% CI, –7.7 to 0.5]; P<0.001)
- **AATAC** (Ablation Versus Amiodarone for Treatment of Persistent Atrial Fibrillation in Patients With Congestive Heart Failure and an Implanted Device)

	Group 1 ablace	Group 2 amio	p
Rehospitalizace	32 [31%; 95% CI, 20%– 41%	58 [57%; 95% CI, 51%–69%	P<0.001
Celková mortalita	8, 8%	18, 18%	P=0.037

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PABA CHF Pulmonary Vein Antrum Isolation vs. AV Node Ablation with Bi-Ventricular Pacing fo Treatment of Atrial Fibrillation in Patients with Congestive Heart Failure

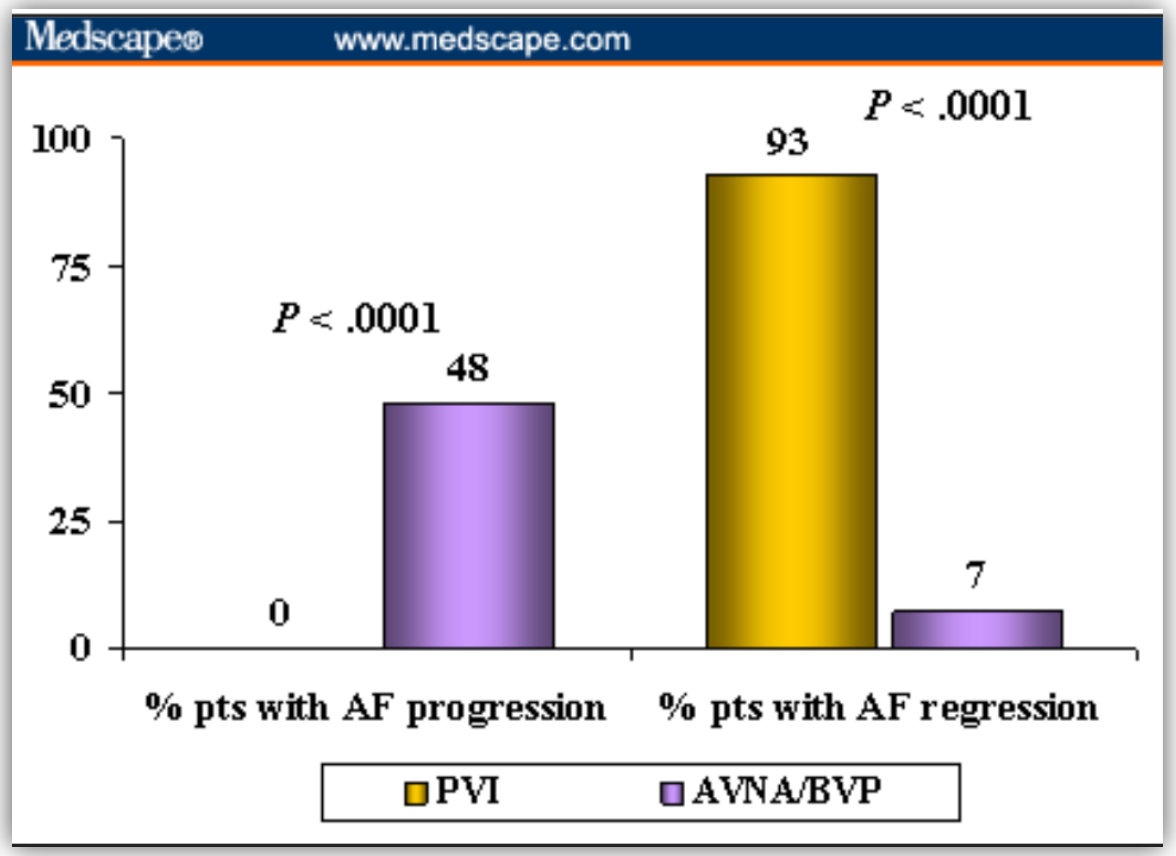
- PVI x CRT+AVN ablation
- PVI superiorní ve smyslu:

zlepšení EF

NYHA

funkční kapacity

QoL



nicméně za cenu více než jedné ablace

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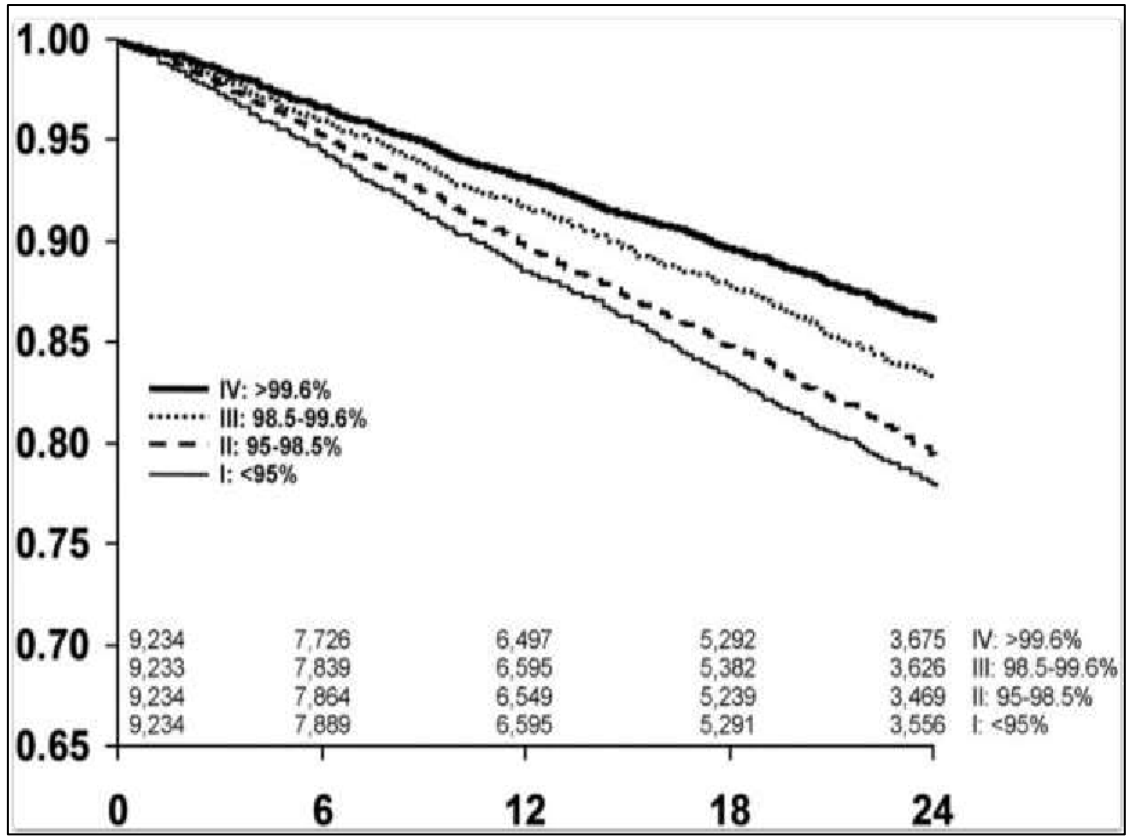
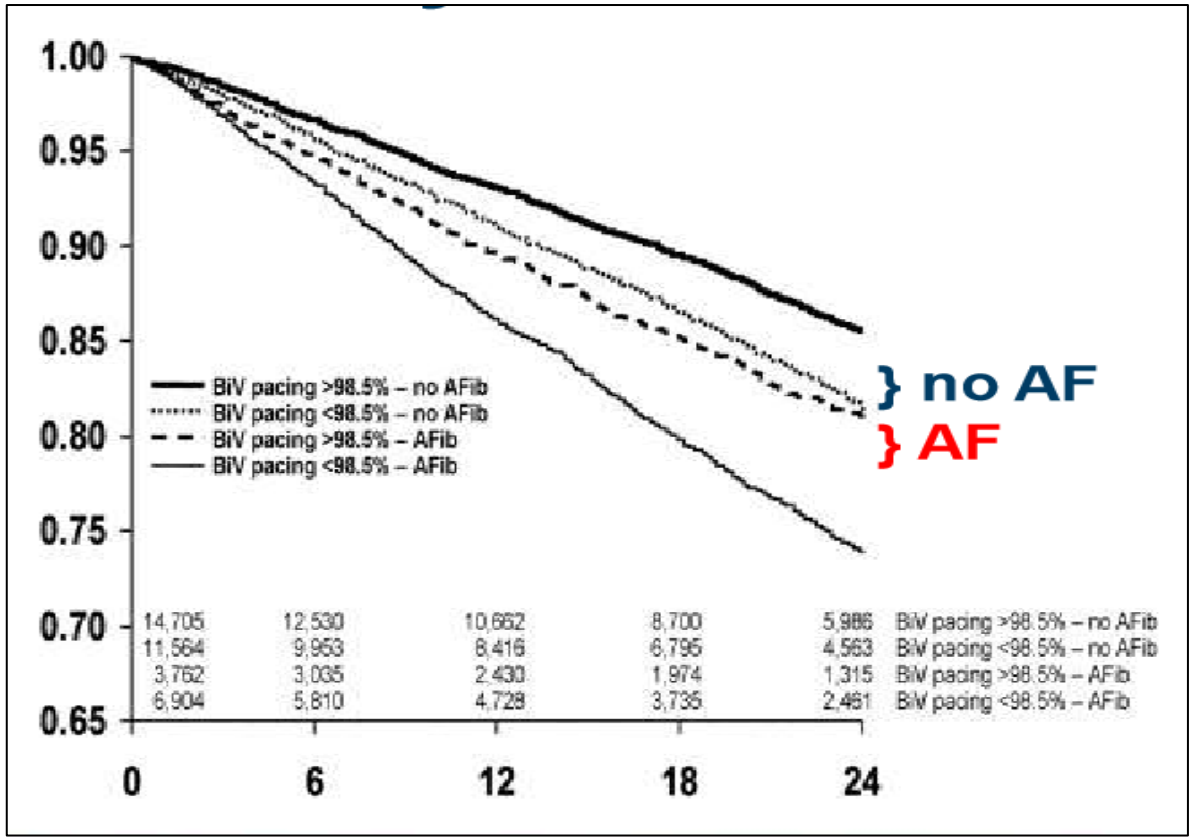
Korelace mortality a procenta BiV stimulace





36,935 patients followed up in a remote-monitoring network, the LATITUDE Patient Management system (Boston Scientific Corp., Natick, Massachusetts)

Hayes DL et al., Cardiac resynchronization therapy and the relationship of percent biventricular pacing to symptoms and survival, Heart Rhythm. 2011 Sep;8(9):1469-75

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CASTLE AF Catheter Ablation for Atrial Fibrillation with Heart Failure

- Multicentrická, randomizovaná (1:1) studie
- Ablace FS x farmakoterapie (rate 70% + rhythm 30% control)
- NYHA II-III, EF LK ≤ 35%, parox./perzist. FS, ICD
- Primární cíl: **celková mortalita a hospitalizace pro SS**

- Celkem: 363 pacientů
- Sledování: 37±20m

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Characteristic	Treatment Type	
	Ablation (N = 179)	Medical Therapy (N = 184)
Age — yr		
Median	64	64
Range	56–71	56–73.5
Male sex — no. (%)	156 (87)	155 (84)
New York Heart Association class — no./total no. (%)		
I	20/174 (11)	19/179 (11)
II	101/174 (58)	109/179 (61)
III	50/174 (29)	49/179 (27)
IV	3/174 (2)	2/179 (1)
Cause of heart failure — no. (%)‡		
Ischemic	72 (40)	96 (52)
Nonischemic	107 (60)	88 (48)
Type of atrial fibrillation — no. (%)		
Paroxysmal	54 (30)	64 (35)
Persistent	125 (70)	120 (65)
Long-standing persistent (duration >1 year)	51 (28)	55 (30)

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Left atrial diameter		
Total no. of patients evaluated	162	172
Median — mm	48.0	49.5
Interquartile range — mm	45.0–54.0	5.0–55.0
Left ventricular ejection fraction		
Total no. of patients evaluated	164	172
Median — %	32.5	31.5
Interquartile range — %	25.0–38.0	27.0–37.0
CRT-D implanted — no. (%)§	48 (27)	52 (28)
ICD implanted — no. (%)§	131 (73)	132 (72)
Dual-chamber	128 (72)	123 (67)
Single-lead device with "floating" atrial sensing dipole	3 (2)	9 (5)
Indication for ICD implantation — no. (%)		
Primary prevention	160 (89)	163 (89)
Secondary prevention	19 (11)	21 (11)
History of amiodarone use — no./total no. (%)¶		
Failure	78/175 (45)	82/176 (47)
Unacceptable side effects	21/175 (12)	24/176 (14)
Nonuse	76/175 (43)	70/176 (40)

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CASTLE AF Catheter Ablation for Atrial Fibrillation with Heart Failure

Table 2. Primary and Secondary Clinical End Points.*

End Point	Ablation (N=179)	Medical Therapy (N=184)	Hazard Ratio (95% CI)	P Value	
				Cox Regression	Log-Rank Test
	number (percent)				
Primary†	51 (28.5)	82 (44.6)	0.62 (0.43–0.87)	0.007	0.006
Secondary					
Death from any cause	24 (13.4)	46 (25.0)	0.53 (0.32–0.86)	0.01	0.009
Heart-failure hospitalization	37 (20.7)	66 (35.9)	0.56 (0.37–0.83)	0.004	0.004
Cardiovascular death	20 (11.2)	41 (22.3)	0.49 (0.29–0.84)	0.009	0.008
Cardiovascular hospitalization	64 (35.8)	89 (48.4)	0.72 (0.52–0.99)	0.04	0.04
Hospitalization for any cause	114 (63.7)	122 (66.3)	0.99 (0.77–1.28)	0.96	0.96
Cerebrovascular accident	5 (2.8)	11 (6.0)	0.46 (0.16–1.33)	0.15	0.14

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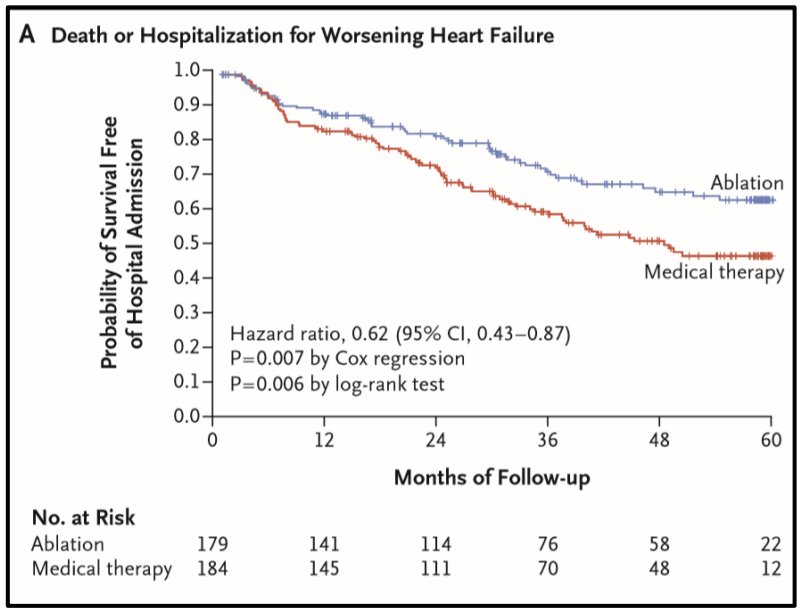
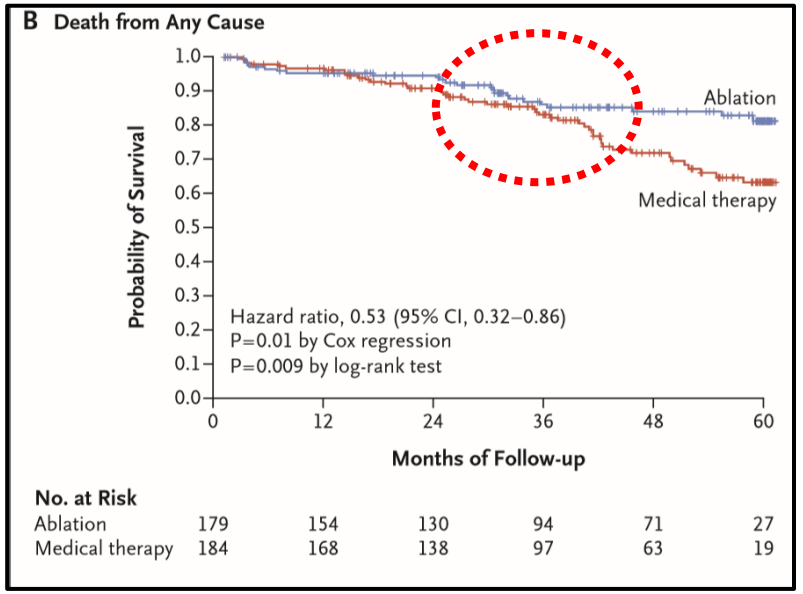
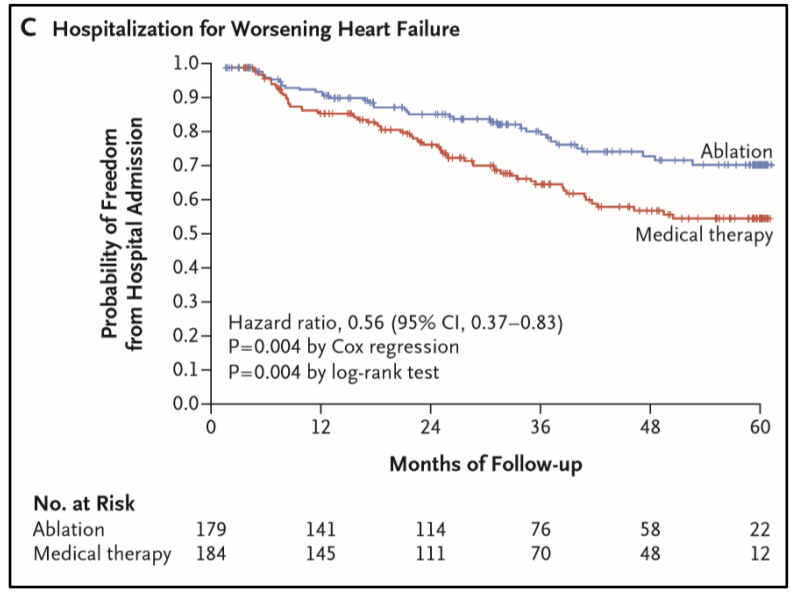
CASTLE AF Catheter Ablation for Atrial Fibrillation with Heart Failure







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CASTLE AF Catheter Ablation for Atrial Fibrillation with Heart Failure

- **Katetrizační ablace:**
- 48% PVI
- 52% PVI + lineární léze, CFAE
- 24% (37 pac.) podstoupilo reablaci = 1,3 ablace/pac.
- Komplikace: perikardiální efuze 3x, 1x perikardiocenteza, 3x krvácení s krevními převody, 1x operace pseudoaneurysmatu
- Po 60m mělo SR 63% pac. x 22% v kontrolní skupině
- Zvýšení EF LK o 8% x 0,2% v kontrolní skupině

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CASTLE AF Catheter Ablation for Atrial Fibrillation with Heart Failure

In conclusion, in a comparison of catheter ablation with medical therapy in patients with heart failure and atrial fibrillation, we found that catheter ablation was associated with lower rates of death from any cause and lower rates of hospital admission for heart failure along with reducing the burden of atrial fibrillation and improving the LVEF.

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Kazuistika 2

- Muž, 68 let
- HN, DM, BMI 32
- FS od 5/2015 …. neúspěšná el. kardioverze i přes léčbu amiodaronem …. FS permanentní, sklon k tachykardii
- Projevy SS, EF LK 40-45%, LS 51mm, střední Mi a Tri regurgitace, SKG – normální
- Několik atak SS NYHA IV, léčba: furosemid, verospiron, ACEi, betablokátory

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- **15.1.2017 referován do NNH k reSKG a navržení dalšího postupu …. ICD??, KCH??, CRT +ablace AV uzlu??**

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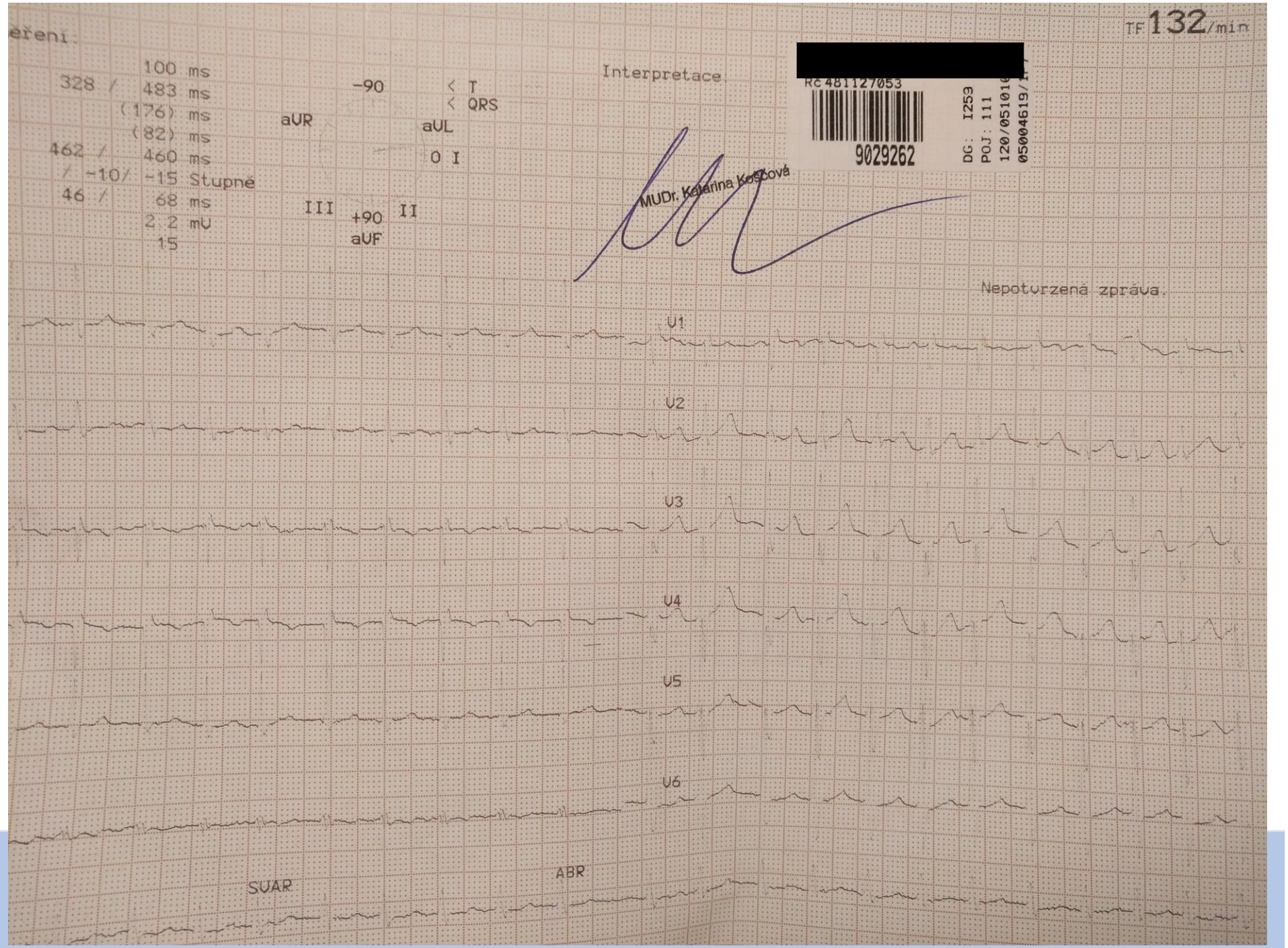

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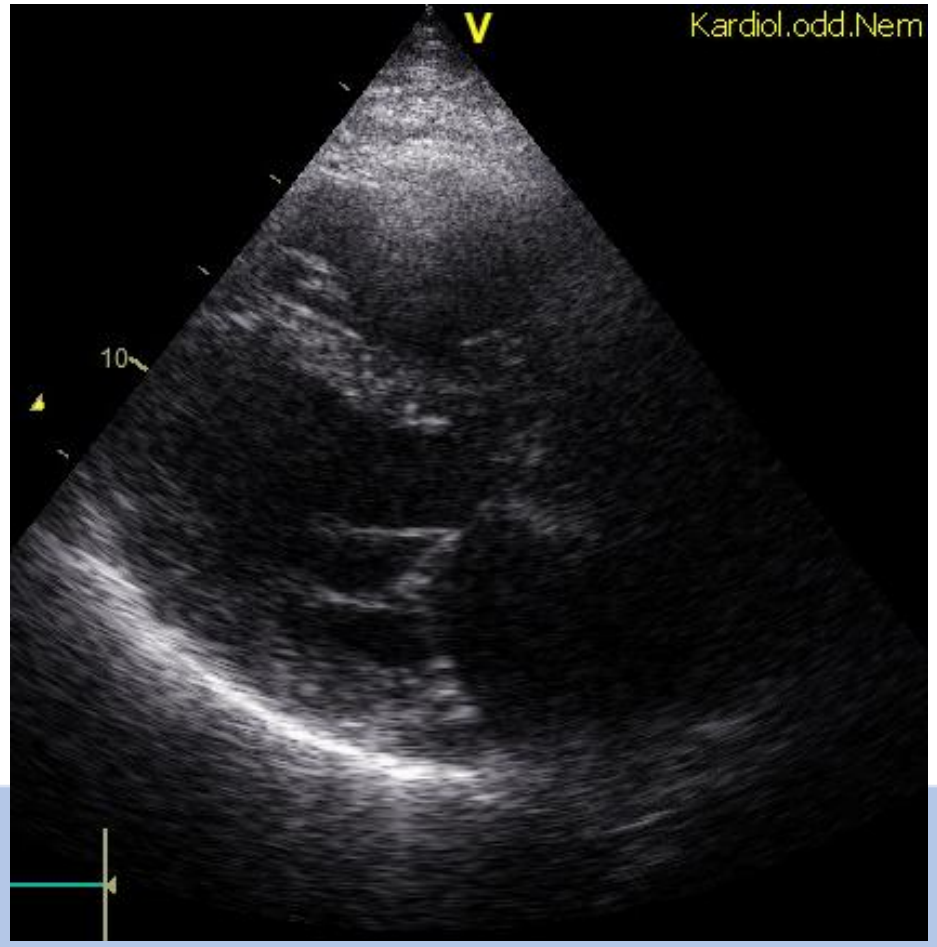
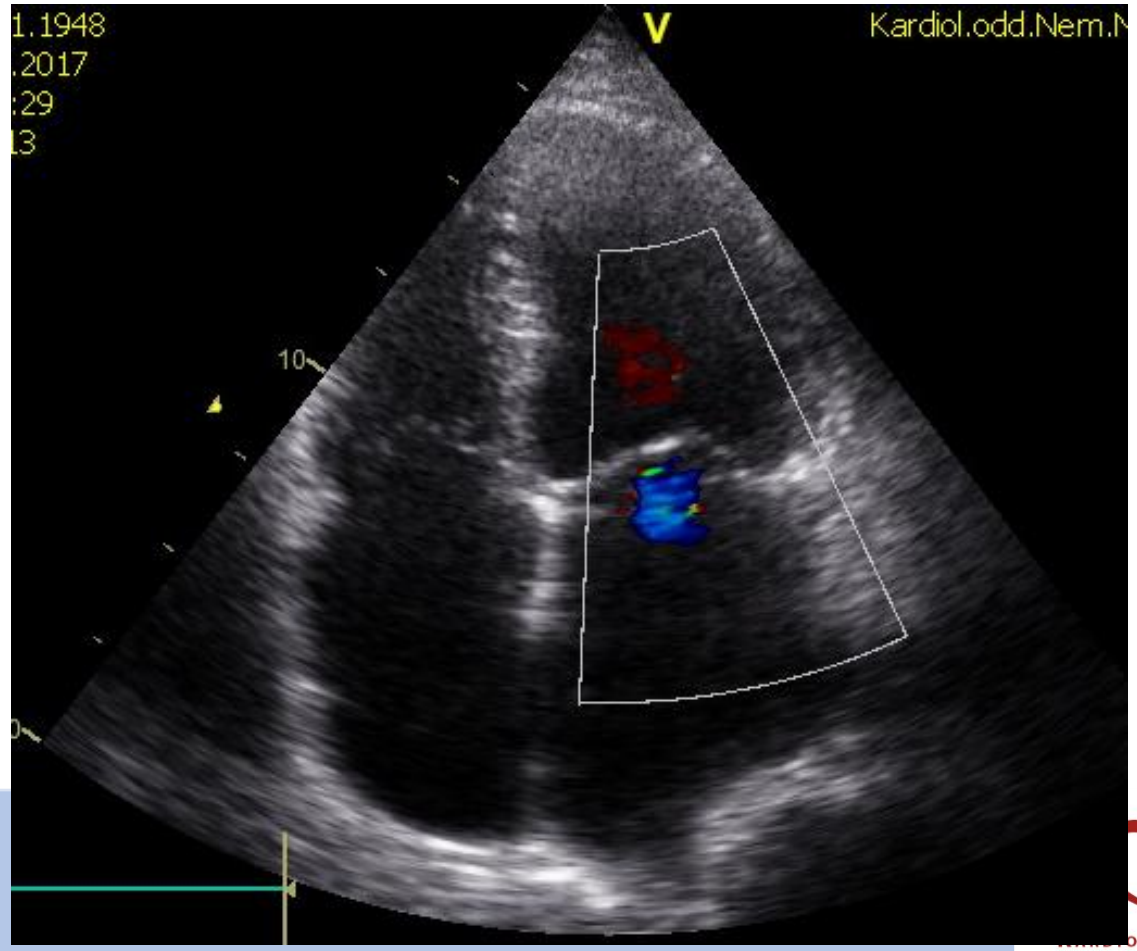
Echokardiografie 16.1.2017

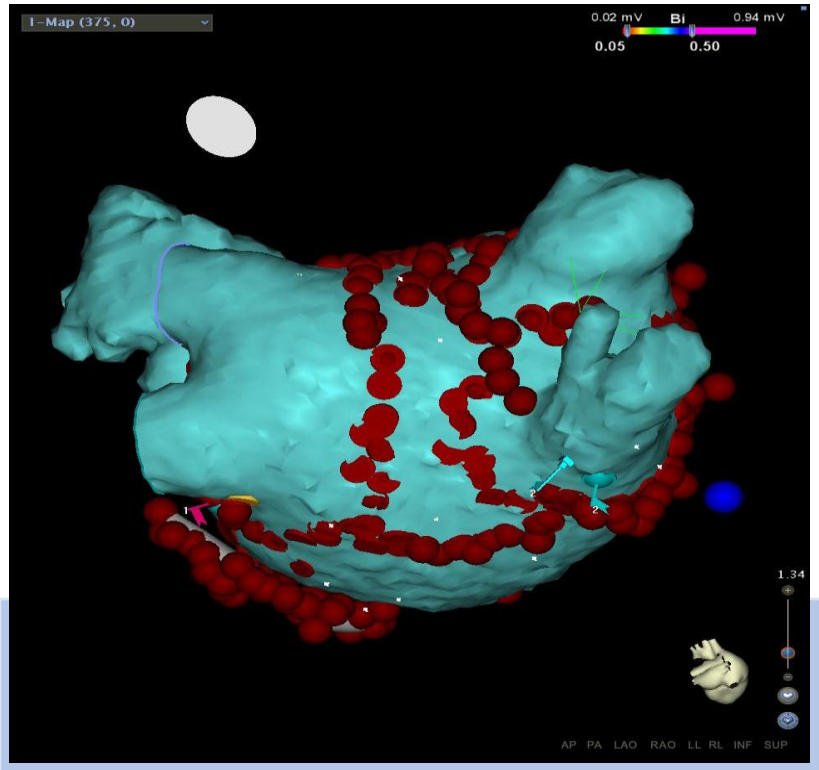
těžká difusní hypokineza LK, EF 30%, dilatace obou síní, LS 57, lehká-střední MI reg.

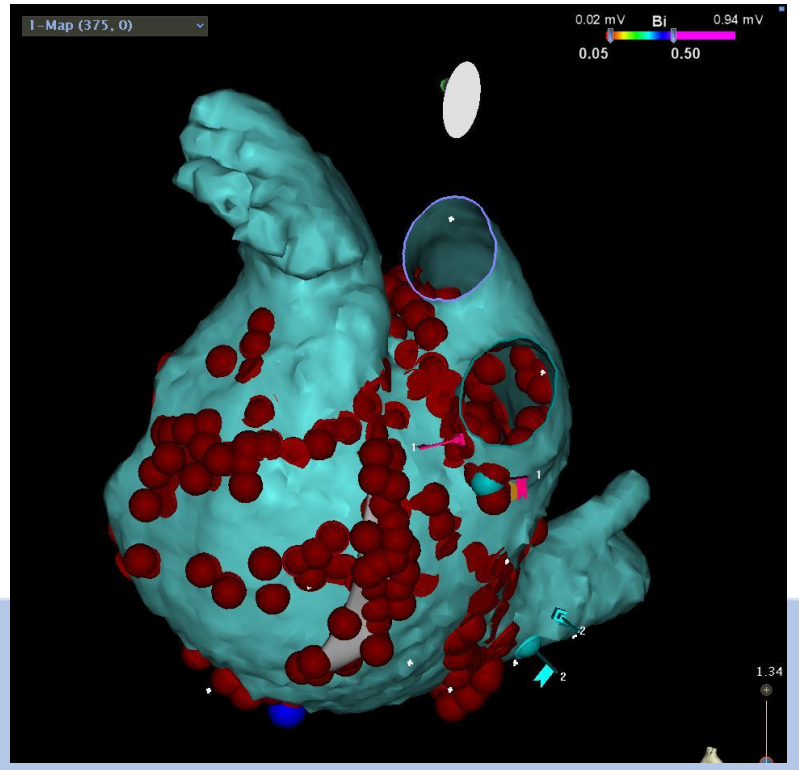


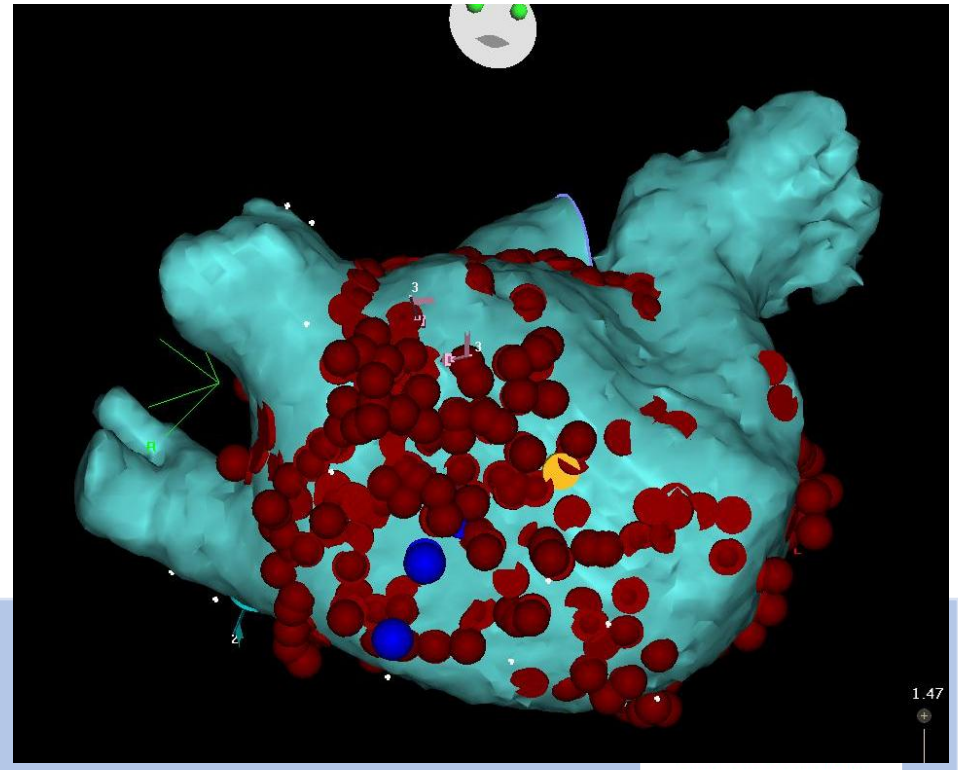


18.1.2017
Katetrizační ablace dlouhodobě perzistující FS

PVI, box léze …. tendence k organizaci … rozsáhlá ablace septa a MI anulu vč. izolace CS, pomalá AT z baze ouška LS … terminace, doplnění linie na CT istmu







EKG při dimisi 20.1.2017 …. sinusový rytmus!!

TERAPIE:

Wafarin

Cordarone

Furon

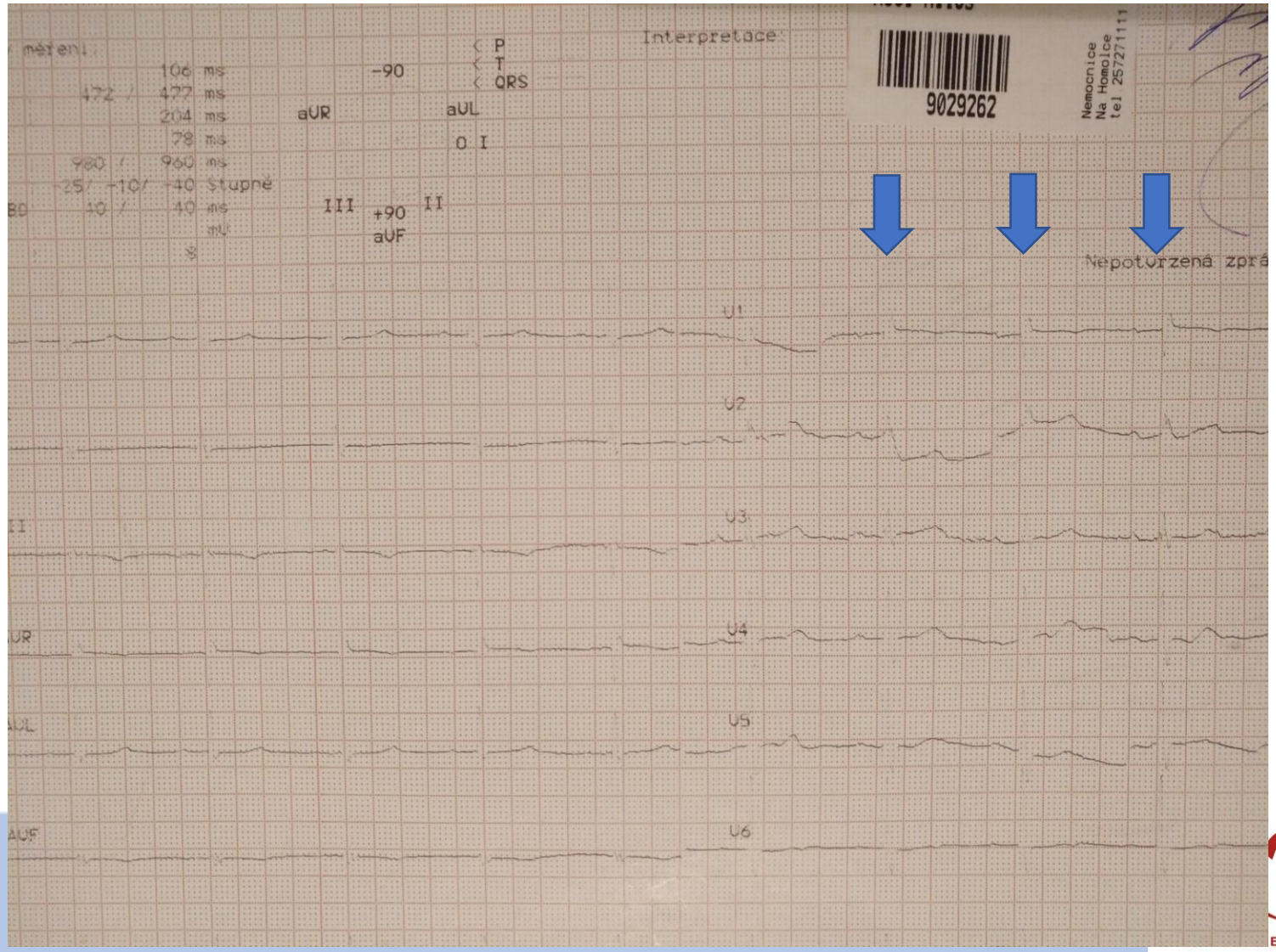
Verospiron

Prestarium Neo Forte

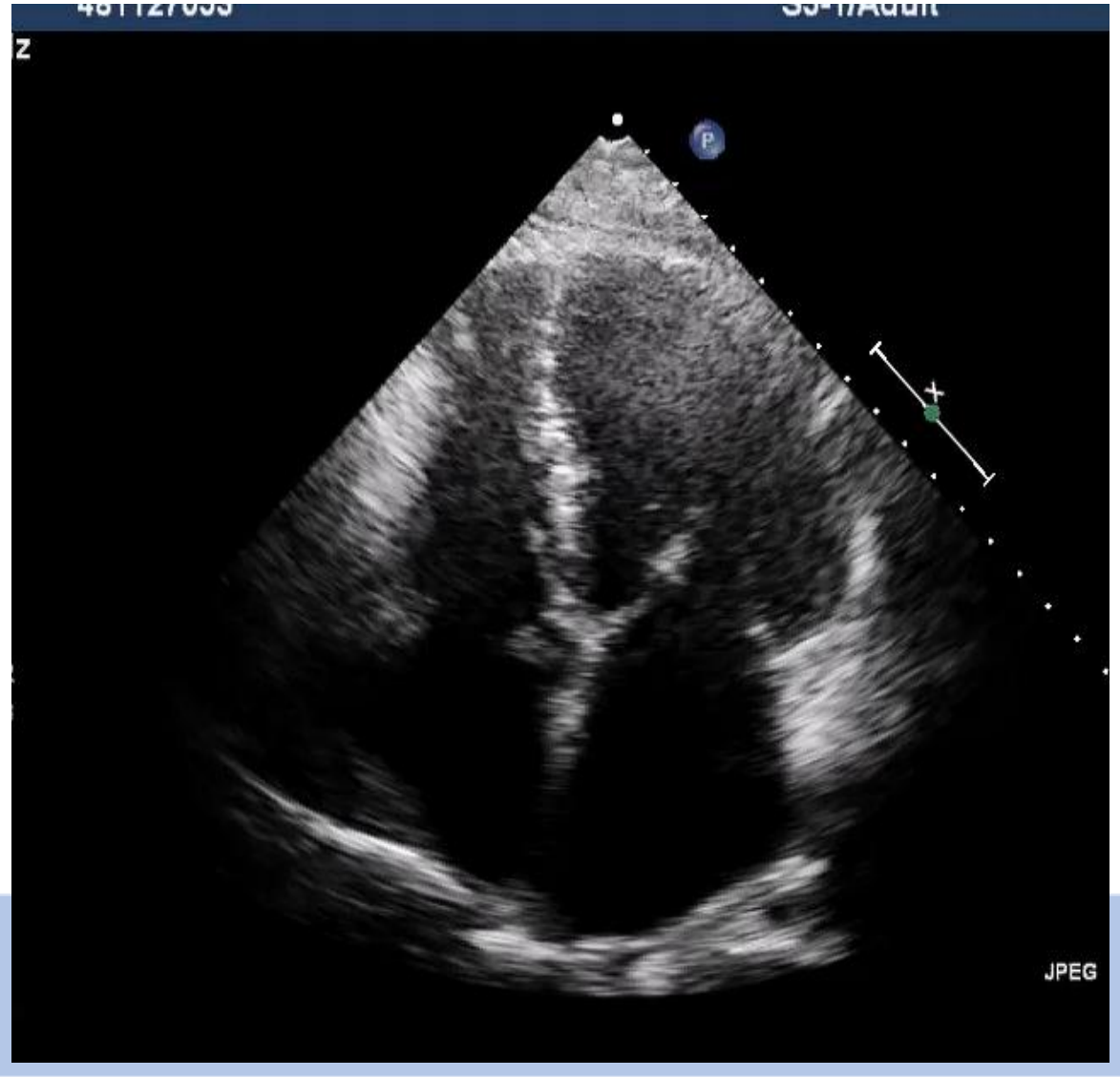
Verospiron

Beta-blokátory ne

(bradykardie)



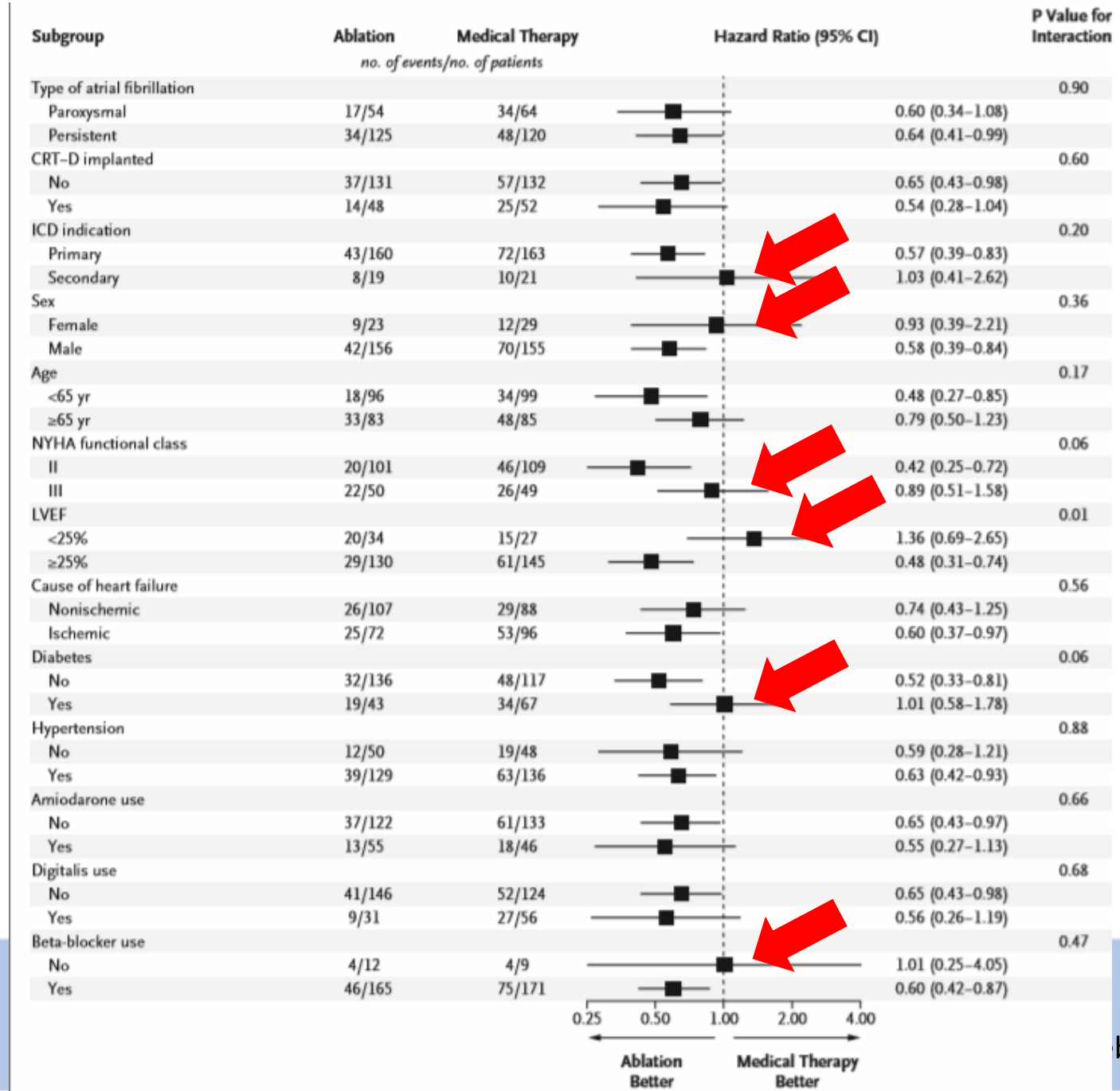
Kontrola 20.4.2017 … trvá SR



- Normalizace kinetiky a funkce LK
- EF 60%
- regrese AV regurgitací

Závěry

- Přítomnost fibrilace síní u nemocných se srdečním selháním jednoznačně zhoršuje jejich prognózu
- Katetrizační ablace je suverénní metodou v léčbě tachykardií indukované kardiomyopatie
- Katetrizační ablace fibrilace síní u nemocných se srdečním selháním snižuje mortalitu a počet rehospitalizací, zlepšuje funkční kapacitu a kvalitu života
- U nemocných s CRT a permanentní fibrilací síní je nutná 100% biventrikulární stimulace k dosažení optimálního efektu léčby … indikace k neselektivní RF ablaci



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AATAC Ablation Versus Amiodarone for Treatment of Persistent Atrial Fibrillation in Patients With Congestive Heart Failure and an Implanted Device

- Multicentrická, randomizovaná 1:1
- Ablace (102) x amiodarone (101)
- Perzist. FS, NYHA II-III, EF pod 40%, ICD/CRTD
- Prim. endpoint.: rekurence FS, doba sledování 24m
- Sek. endpoint: celková mortalita, rehospitalizace

- Ablace: 22 PVI x 80 PVI box léze, CFAE, ….
- Procedurální komplikace 1,96%, perikard efuze 0,98%
- Amiodarone bylo nutno vysadit u 7 pac. pro NÚ

Table 1. Baseline Characteristics of Study Population

	Group 1 (Catheter Ablation, n=102)	Group 2 (Amiodarone, n=101)
Age, y	62±10	60±11
Male, n (%)	77 (75)	74 (73)
AF duration, mo	8.6±3.2	8.4±4.1
BMI, kg/m^2	30±8	29±4
Hypertension, n (%)	46 (45)	48 (48)
Diabetes mellitus, n (%)	22 (22)	24 (24)
Coronary artery disease, n (%)	63 (62)	66 (65)
LA diameter, mm	47±4.2	48±4.9
LVEF, %	29±5	30±8
6MWD, meters	348±111	350±130
MLHFQ Score	52±24	50±27
OSA, n (%)	46 (45)	48 (48)
ACEI or ARB, n (%)	94 (92)	89 (88)
Aldosterone antagonists, n (%)	46 (45)	51 (50)
β-Blockers, n (%)	78 (76)	81 (80)

Di Biase, Circulation. 2016;133:1637-1644

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AATAC Ablation Versus Amiodarone for Treatment of Persistent Atrial Fibrillation in Patients With Congestive Heart Failure and an Implanted Device

	Group 1 ablace	Group 2 amio	p
Rehospitalizace	32 [31%; 95% CI, 20%– 41%	58 [57%; 95% CI, 51%–69%	P<0.001
Celková mortalita	8, 8%	18, 18%	P=0.037

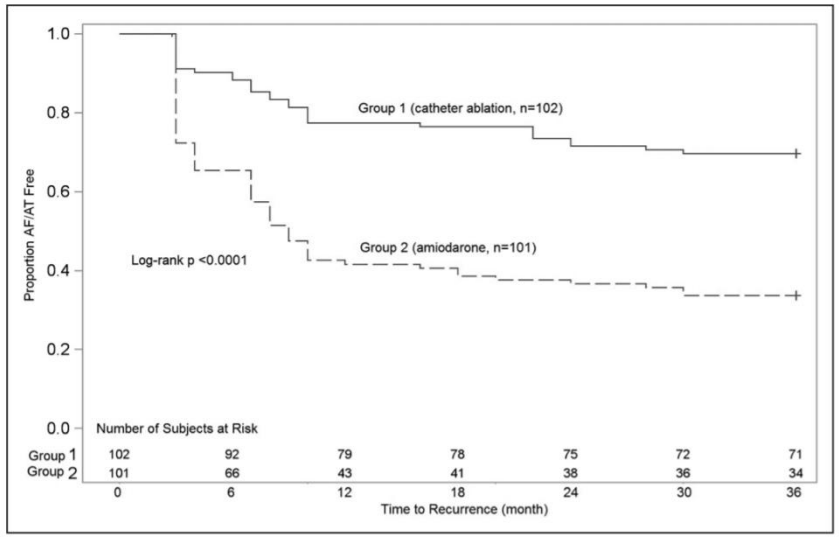

Figure 2. Kaplan–Meier curve comparing AF-free survival between patients undergoing catheter ablation (group 1) and those receiving amiodarone therapy (group 2). At end of the study, 71 (70%; 95% CI, 60%–78%) patients in group 1 were recurrence free in comparison with 34 (34%; 95% CI, 25%–44%) in group 2 (log-rank *P*<0.001). AF indicates atrial fibrillation; AT, atrial tachycardia; and CI, confidence interval.

Table 3. Change in LVEF, 6MWD, and MLHFQ Score by Recurrence Status

	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, meters	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

Data are summarized as mean±standard deviation. LVEF indicates left ventricular ejection fraction; MLHFQ, Minnesota Living with Heart Failure Questionnaire; and 6MWD, 6-minute walk distance.

Di Biase, Circulation. 2016;133:1637-1644

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CAMTAF A Randomized Controlled Trial of Catheter Ablation Versus Medical Treatment of Atrial Fibrillation in Heart Failure

Background—Restoring sinus rhythm in patients with heart failure (HF) and atrial fibrillation (AF) may improve left ventricular (LV) function and HF symptoms. We sought to compare the effect of a catheter ablation strategy with that of a medical rate control strategy in patients with persistent AF and HF.

Methods and Results—Patients with persistent AF, symptomatic HF, and LV ejection fraction <50% were randomized to catheter ablation or medical rate control. The primary end-point was the difference between groups in LV ejection fraction at 6 months. Baseline LV ejection fraction was 32±8% in the ablation group and 34±12% in the medical group. Twenty-six patients underwent catheter ablation, and 24 patients were rate controlled. Freedom from AF was achieved in 21/26 (81%) at 6 months off antiarrhythmic drugs. LV ejection fraction at 6 months in the ablation group was 40±12% compared with 31±13% in the rate control group (P=0.015). Ablation was associated with better peak oxygen consumption (22±6 versus 18±6 mL/kg per minute; P=0.014) and Minnesota living with HF questionnaire score (24±22 versus 47±22; P=0.001) compared with rate control.

Conclusions—Catheter ablation is effective in restoring sinus rhythm in selected patients with persistent AF and HF, and can improve LV function, functional capacity, and HF symptoms compared with rate control.

Clinical Trial Registration—URL: http://www.clinicaltrials.gov. Unique identifier: NCT01411371

(*Circ Arrhythm Electrophysiol*. 2014;7:31-38.)

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RAFT Cardiac Resynchronization Therapy in Patients With Permanent Atrial Fibrillation

Background—Cardiac resynchronization (CRT) prolongs survival in patients with systolic heart failure and QRS prolongation. However, most trials excluded patients with permanent atrial fibrillation.

Methods and Results—The Resynchronization for Ambulatory Heart Failure Trial (RAFT) randomized patients to an implantable cardioverter defibrillator (ICD) or ICD+CRT, stratified by the presence of permanent atrial fibrillation. Patients with permanent atrial fibrillation were randomized to CRT-ICD (n=114) or ICD (n=115). Patients receiving a CRT-ICD were similar to those receiving an ICD: age (71.6±7.3 versus 70.4±7.7 years), left ventricular ejection fraction (22.9±5.3% versus 22.3±5.1%), and QRS duration (151.0±23.6 versus 153.4±24.7 ms). There was no difference in the primary outcome of death or heart failure hospitalization between those assigned to CRT-ICD versus ICD (hazard ratio, 0.96; 95% CI, 0.65–1.41; P=0.82). Cardiovascular death was similar between treatment arms (hazard ratio, 0.97; 95% CI, 0.55–1.71; P=0.91); however, there was a trend for fewer heart failure hospitalizations with CRT-ICD (hazard ratio, 0.58; 95% CI, 0.38–1.01; P=0.052). The change in 6-minute hall walk duration between baseline and 12 months was not different between treatment arms (CRT-ICD: 19±84 m versus ICD: 16±76 m; P=0.88). Patients treated with CRT-ICD showed a trend for a greater improvement in Minnesota Living with Heart Failure score between baseline and 6 months (CRT-ICD: 41±21 to 31±21; ICD: 33±20 to 28±20; P=0.057).

Conclusions—Patients with permanent atrial fibrillation who are otherwise CRT candidates appear to gain minimal benefit from CRT-ICD compared with a standard ICD.

Clinical Trial Registration—URL: http://www.clinicaltrials.gov. Unique identifier: NCT00251251. **(*Circ Heart Fail.* 2012;5:566-570.)**

Ve skupině CRTD jen 1/3 pacientů měla více než 90% BiV stimulace (možná ještě nadhodnoceno - fusion/pseudofusion beats)

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Cardiac Resynchronization Therapy in Patients With Permanent Atrial Fibrillation

Results From the Resynchronization for Ambulatory Heart Failure Trial (RAFT)

Jeff S. Healey, MD, MSc; Stefan H. Hohnloser, MD; Derek V. Exner, MD; David H. Birnie, MD; Ratika Parkash, MD, MSc; Stuart J. Connolly, MD; Andrew D. Krahn, MD; Chris S. Simpson, MD; Bernard Thibault, MD; Magdy Basta, MD; Francois Philippon, MD; Paul Dorian, MD; Girish M. Nair, MBBS; Soori Sivakumaran, MD; Elizabeth Yetisir, MSc; George A. Wells, PhD; Anthony S.L. Tang, MD; on behalf of the RAFT Investigators

Circulation: Heart Failure. 2012;5:566-570

- 229 subjects with permanent AF randomized to receive an ICD (n=115) or a CRT-ICD(n=114)
- Only 1 patient had an AV junction ablation
- 34.3% of CRT-treated subject had ≥95% biventricular pacing and 47.1% had ≥90% pacing
- No statistical difference in the risk of or those receiving < 95 % ventricular pacing versus ≥ 95 %

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Neselektivní RF ablace AV uzlu

Role of AV Nodal Ablation in Cardiac Resynchronization in Patients With Coexistent Atrial Fibrillation and Heart Failure

A Systematic Review

Anand N. Ganesan, MBBS, PHD,* Anthony G. Brooks, PHD,*
Kurt C. Roberts-Thomson, MBBS, PHD,* Dennis H. Lau, MBBS, PHD,*
Jonathan M. Kalman, MBBS, PHD,† Prashanthan Sanders, MBBS, PHD*
Adelaide and Melbourne, Australia

Objectives The aim of this study was to systematically review the medical literature to evaluate the impact of AV nodal ablation in patients with heart failure and coexistent atrial fibrillation (AF) receiving cardiac resynchronization therapy (CRT).

Background CRT has a substantial evidence base in patients in sinus rhythm with significant systolic dysfunction, symptomatic heart failure, and prolonged QRS duration. The role of CRT is less well established in AF patients with coexistent heart failure. AV nodal ablation has recently been suggested to improve outcomes in this group.

Methods Electronic databases and reference lists through September 15, 2010, were searched. Two reviewers independently evaluated citation titles, abstracts, and articles. Studies reporting the outcomes after AV nodal ablation in patients with AF undergoing CRT for symptomatic heart failure and left ventricular dyssynchrony were selected. Data were extracted from 6 studies, including 768 CRT-AF patients, composed of 339 patients who underwent AV nodal ablation and 429 treated with medical therapy aimed at rate control alone.

Results AV nodal ablation in CRT-AF patients was associated with significant reductions in all-cause mortality (risk ratio: 0.42 [95% confidence interval: 0.26 to 0.68]), cardiovascular mortality (risk ratio: 0.44 [95% confidence interval: 0.24 to 0.81]), and improvement in mean New York Heart Association functional class (risk ratio: −0.52 [95% confidence interval: −0.87 to −0.17]).

Conclusions AV nodal ablation was associated with a substantial reduction in all-cause mortality and cardiovascular mortality and with improvements in New York Heart Association functional class compared with medical therapy in CRT-AF patients. Randomized controlled trials are warranted to confirm the efficacy and safety of AV nodal ablation in this patient population. (J Am Coll Cardiol 2012;59:719–26)

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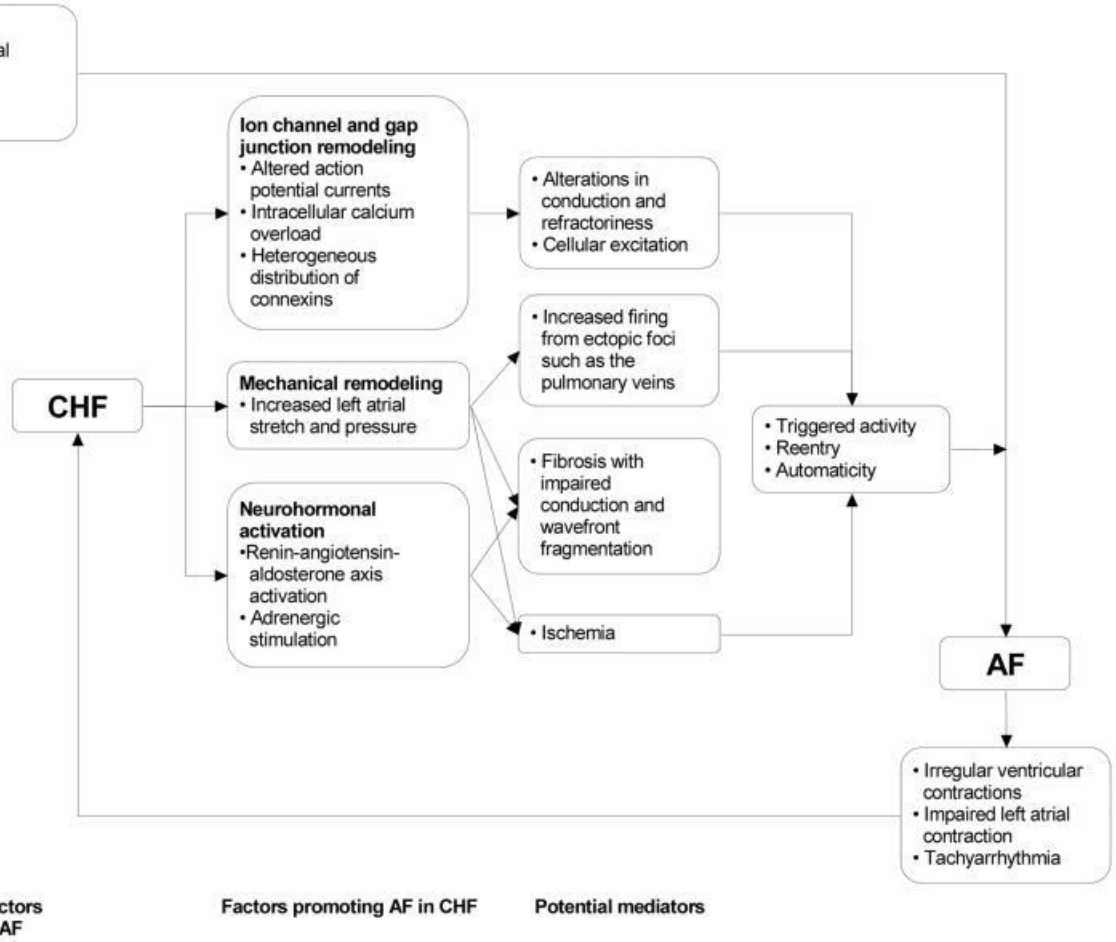
Probíhající studie

- RAFT AF: Rhythm Control - Catheter Ablation With or Without Anti-arrhythmic Drug Control of Maintaining Sinus Rhythm Versus Rate Control With Medical Therapy and/or Atrio-ventricular Junction Ablation and Pacemaker Treatment for Atrial Fibrillation

studie	N	Endpoint	Předpokládané ukončení	randomizace					
RAFT AF	412/1000	Celková mortalita, hospitalizace pro SS	2020	Ano, ablace x rate control					

Patofyziologie vzniku srdečního selhání u fibrilace sí



Heart Fail Clin. 2010 April ; 6(2): 187–200. doi:10.1016/j.hfc.2009.11.001.

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HF, AF, and Catheter Ablation: Prior Studies

•There are several completed, small, prospective, mostly randomized studies in patients with HF : a) Hsu et al. (NEJM 2004;351:2373-83; 58 pts) demonstrated that AF ablation resulted in improvement in LVEF, LV fractional shortening, LV end diastolic dimentions, and LV end systolic dimentions ; b) Stulak et al. (Ann Thorac Surg 2006;82:494-501; 37 pts) at late f/u (median 48 months) after a Maze, significant increase in LVEF was seen in pts with the most severe LVEF impairment; c) PABA trial (Khan et al., NEJM 2008;359:1778-85; 41 pts) demonstrated superiority of AF ablation over AV node ablation with BiV pacing; c) MacDonald et al. (Heart 2011;97:740-7; 22 pts) did not show any impact on magnetic resonance derived LVEF, N-terminal pro-B-type natriuretic peptide, 6 min walk, or quality of life, d) Jones et al. (J Am Coll Cardiol 2013;61:1894-903; 26 pts) showed peak oxygen consumption increased significantly in the ablation arm, and decreased in the rate control arm, but the LVEF increased in both arms, with no significant difference between them; e) Nedios et al. (Heart Rhythm 2014;11:344-51; 69 pts) found initial short term (six months) LVEF improvement post ablation and rate control related to baseline heart rate, but long term (one year) LVEF improvement was only related to rhythm outcome; and f) CAMTAF trial (Hunter et al. Circ Arrhythm Electrophysiol 2014;7:31-8; 26 pts) found significant improvement in LVEF, functional capacity and symptoms after ablation compared to rate control.

Modified after O'Neill MB: J Am Coll Cardiol 2013;61:1904-5

RAFT-AF is a study to compare the effect of catheter ablation-based atrial fibrillation rhythm control to rate control in patients with heart failure and high burden atrial fibrillation on the composite endpoint of all-cause mortality and hospitalization for heart failure defined as an admission to a health care facility for > 24 hours.

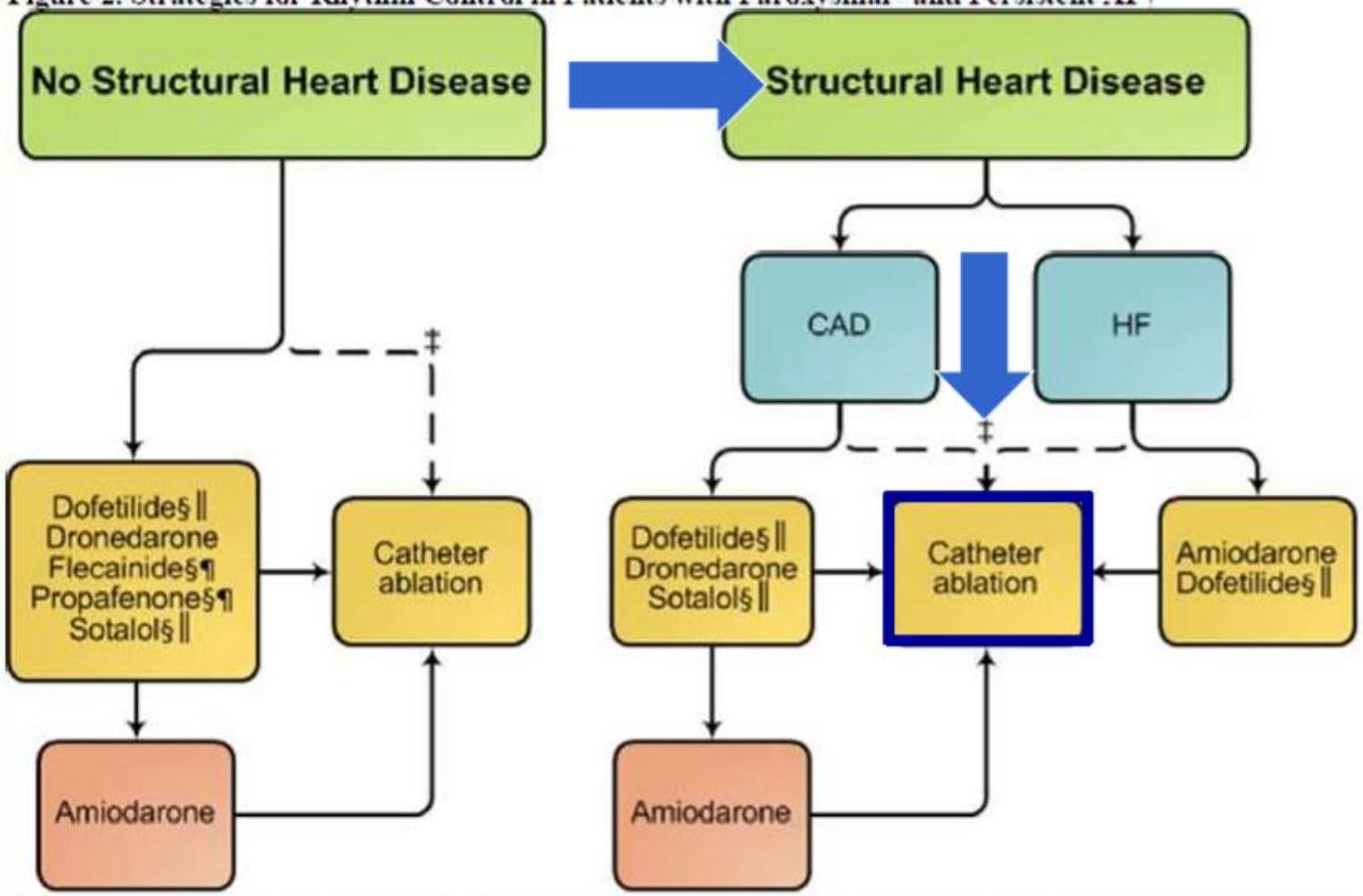
CASTLE-AF is a prospective, unblinded, randomized, multicenter study whose aim is to compare the effect of radiofrequency catheter-based ablation on mortality and morbidity with that of conventional treatment in HF subjects with AF

CABANA (Catheter Ablation Versus Anti-arrhythmic Drug Therapy for Atrial Fibrillation Trial) is designed to test the hypothesis that the treatment strategy of left atrial catheter ablation for the purpose of eliminating AF will be superior to current state-of-the-art therapy with either rate control or rhythm control drugs for decreasing the incidence of the composite endpoint of total mortality, disabling stroke, serious bleeding, or cardiac arrest in patients with untreated or incompletely treated AF.

ClinicalTrials.gov

2014 AHA/ACC/HRS Guideline for the Management of Patients With AF

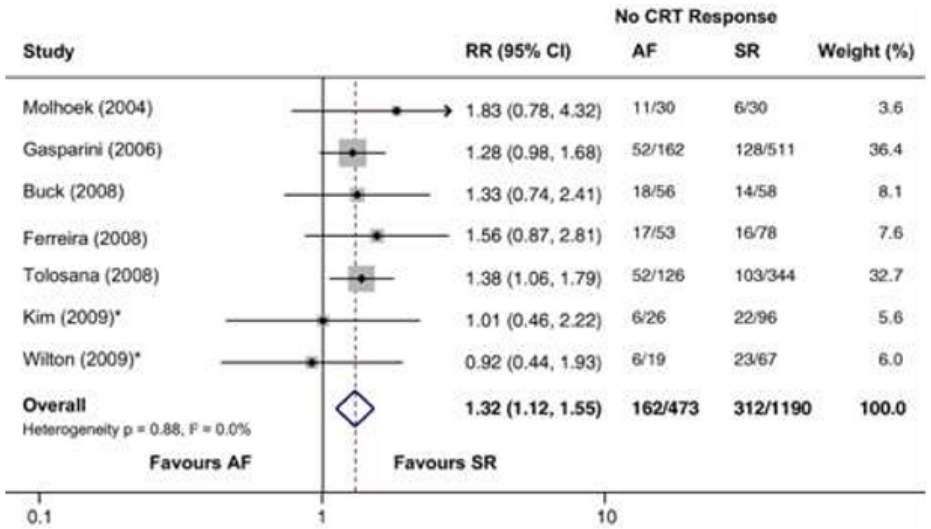
Figure 2. Strategies for Rhythm Control in Patients with Paroxysmal* and Persistent AF†

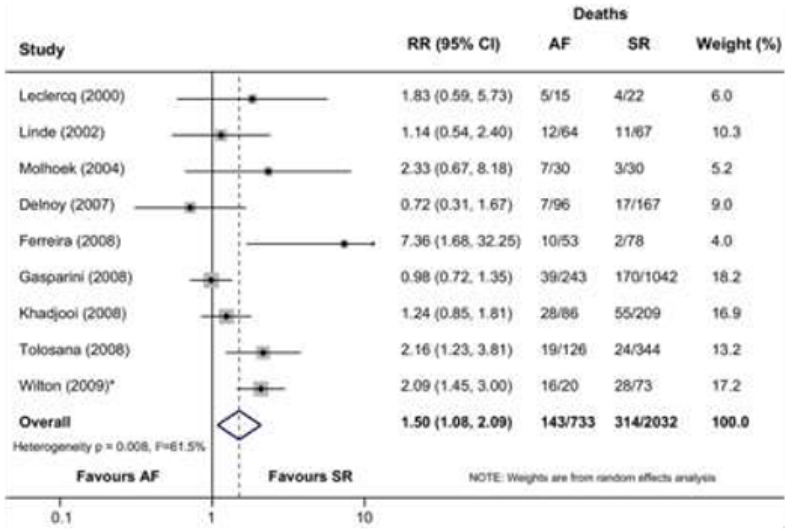


*Catheter ablation is only recommended as first-line therapy for patients with paroxysmal AF (Class IIa recommendation).
†Drugs are listed alphabetically.
‡Depending on patient preference when performed in experienced centers.
§Not recommended with severe LVH (wall thickness >1.5 cm).
‖Should be used with caution in patients at risk for torsades de pointes ventricular tachycardia.
¶Should be combined with AV nodal blocking agents.

January CT et al. Circulation. 2014;130:2071-104.

Meta-Analysis: Outcomes in CRT patients with and without AF





Patients with AF do not do as well as patients in sinus rhythm

Wilton SB et al.
Heart Rhythm 2011;8;1088-1094

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Prevalence FS u nemocných se srdečním selháním