

Autonomic Changes Are More Durable After Radiofrequency Than Pulsed Electric Field Pulmonary Vein Ablation

P. Stojadinović, D. Wichterle, P. Peichl, H. Nakagawa, R. Čihák, J. Hašková,
J. Kautzner

Institut pro klinickou a experimentální medicínu, IKEM, Praha

Department of Cardiovascular Medicine, Cleveland Clinic, Cleveland, Ohio, USA





JACC: Clinical Electrophysiology

Volume 8, Issue 7, July 2022, Pages 895-904



Original Research

Atrial Fibrillation - Catheter Ablation

Autonomic Changes Are More Durable After Radiofrequency Than Pulsed Electric Field Pulmonary Vein Ablation

Predrag Stojadinović MD^a  , Dan Wichterle MD, PhD^a, Petr Peichl MD, PhD^a,
Hiroshi Nakagawa MD, PhD^b, Robert Čihák MD, PhD^a, Jana Hašková MD^a,
Josef Kautzner MD, PhD^a

^a Institute for Clinical and Experimental Medicine, Prague, Czech Republic

^b Department of Cardiovascular Medicine, Cleveland Clinic, Cleveland, Ohio, USA

Received 28 December 2021, Revised 28 March 2022, Accepted 24 April 2022, Available online 29 June 2022, Version of Record 18 July 2022.



Úvod

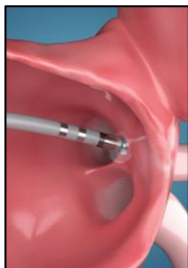
- Izolace plicních žil (IPŽ) radiofrekvenční energií je spojena se změnou parasympatické inervace srdce v důsledku kolaterálního poškození gangliových plexů.
- Elektroporace je nová, netermální forma energie která selektivně ovlivňuje kardiomyocyty a šetří nervy.
- Hypotéza: IPŽ pomocí elektroporace, na rozdíl od RF energie, bude mít menší akutní efekt na kardiální nervový systém.



Metodika studie

Prospektivní, nerandomizovaná studie
23 pacientů

11 pacientů



12 pacientů



Pachonův neurostimulátor

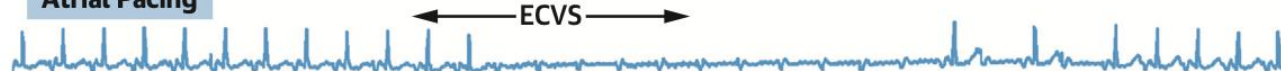


Example of Baseline Response of the Sinus and AV Node to ECVS

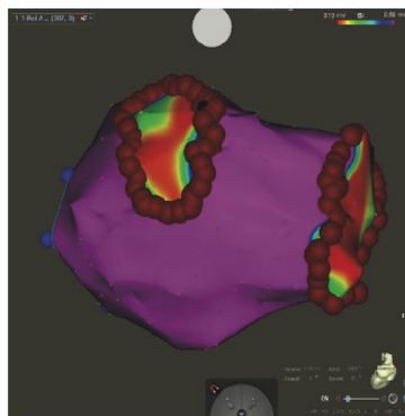
Sinus Rhythm



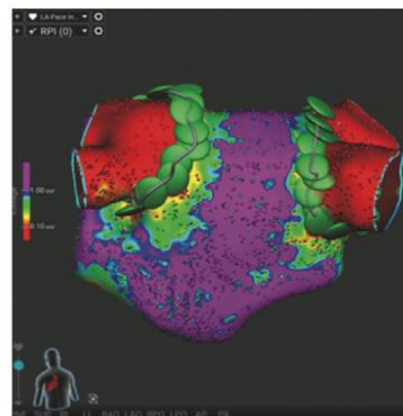
Atrial Pacing



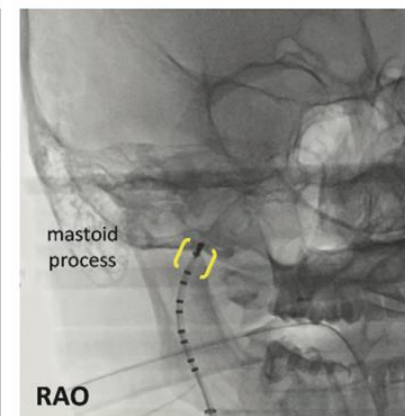
Radiofrequency PV Ablation



Pulsed Electric Field PV Ablation



Catheter Position for ECVS



XXXI. VÝROČNÍ SJEZD
ČESKÉ KARDIOLOGICKÉ
SPOLEČNOSTI



Základní charakteristiky souboru

TABLE 1 Baseline Characteristics			
	Radiofrequency Group (n = 13)	Pulsed Electric Field Group (n = 18)	P Value
Age, y	53 ± 16	59 ± 10	0.2
Male	7 (54)	15 (83)	0.11
Body mass index, kg/m ²	26 ± 3.6	31 ± 5.3	0.008
Arterial hypertension	8 (62)	11 (61)	1
Diabetes mellitus	1 (8)	2 (11)	1
Coronary artery disease	1 (8)	2 (11)	1
Transient ischemic attack or stroke	0 (0)	2 (11)	1
Left ventricular ejection fraction, %	59 ± 1	57 ± 5	0.07
Left atrium volume index, ml/m ²	34 ± 10	39 ± 9	0.10
Atrial fibrillation duration, months	36 ± 53	28 ± 23	0.60
Beta-blockers	9 (69)	15 (83)	0.41
Antiarrhythmic drugs ^a	8(61)	14 (77)	0.43
Sinus rhythm on admission	12 (92)	9 (50)	0.01
Values are mean ± SD or n (%). ^a Propafenone or amiodarone.			



Výsledky

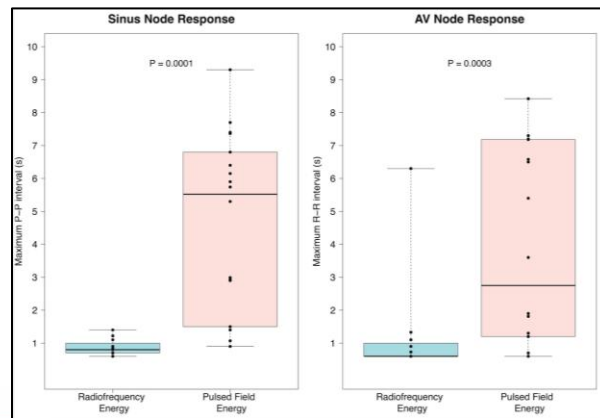
TABLE 2 Changes of Electrophysiological Parameters

	Radiofrequency Ablation (n = 13)			Pulsed Electric Field Ablation (n = 18)			P Value RF vs PEF
	Before PVI	After PVI ^a	Change	Before PVI	After PVI ^a	Change	
Heart rate, beats/min ^b	60.5 ± 8.7	80.8 ± 8.8	+20.3 ± 13.2 ^c	55 ± 11.5	67.1 ± 9.9	+12.1 ± 9.9 ^c	0.04
Heart rate, beats/min ^d	55 ± 8.2	73.3 ± 15.5	+18.6 ± 11.9 ^c	49.2 ± 9.0	60.7 ± 15.5	+11.5 ± 13.4 ^c	0.06
Sinus node recovery time, ms	1,322 ± 301	1,116 ± 309	-205 ± 338 ^e	1,794 ± 650	1,500 ± 484	-294 ± 586 ^e	0.7
Wenckebach point, beats/min	155 ± 23	156 ± 25	+1.5 ± 12 ^f	126 ± 22	132 ± 22	+5.7 ± 21 ^f	0.6

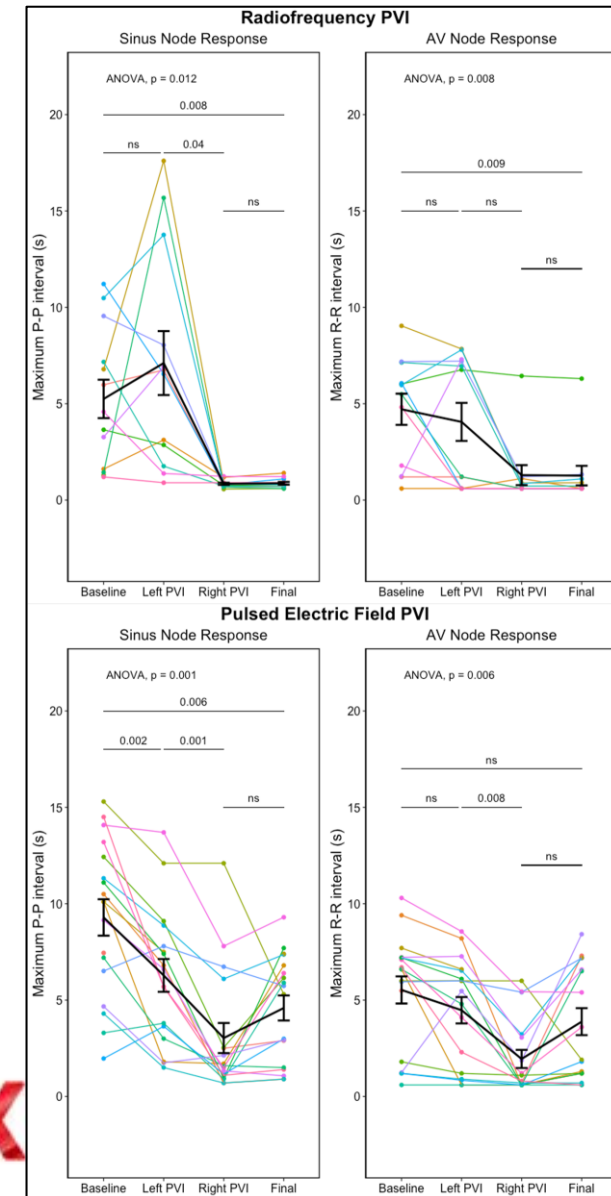
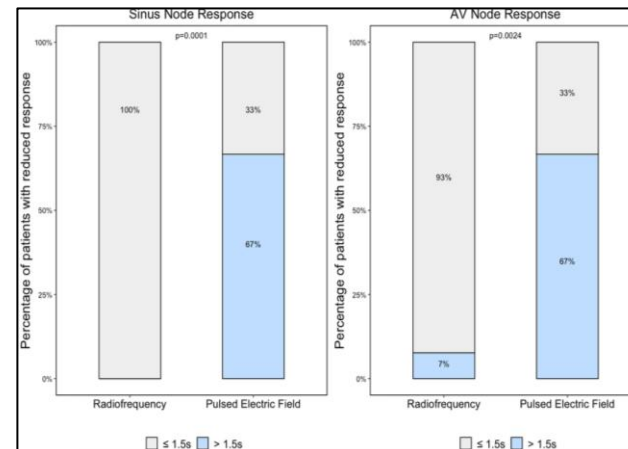
Values are mean ± SD. ^aAt the end of the procedure (after the waiting period). ^bMean heart rate from standard surface electrocardiogram recorded at the ward. ^c $P < 0.005$ (for the statistical significance of the change within the study groups). ^dMean heart rate recorded during the ablation procedure. ^e $P \leq 0.05$. ^f $P > 0.05$.

PVI = pulmonary vein isolation.

Reaktivita SA a AV ulzu



Denervace SA a AV ulzu



Závěr

- Srdeční vagové reakce jsou zachovalé u většiny pacientů po izolaci plicních žil energií pulzního elektrického pole na rozdíl od RF energie.
- Zachovalá parasympatická inervace srdce může ovlivnit i klinický výsledek katetrizační procedury.

