

Three-dimensional left atrial reservoir function during sinus rhythm is able to predict the presence of paroxysmal atrial fibrillation

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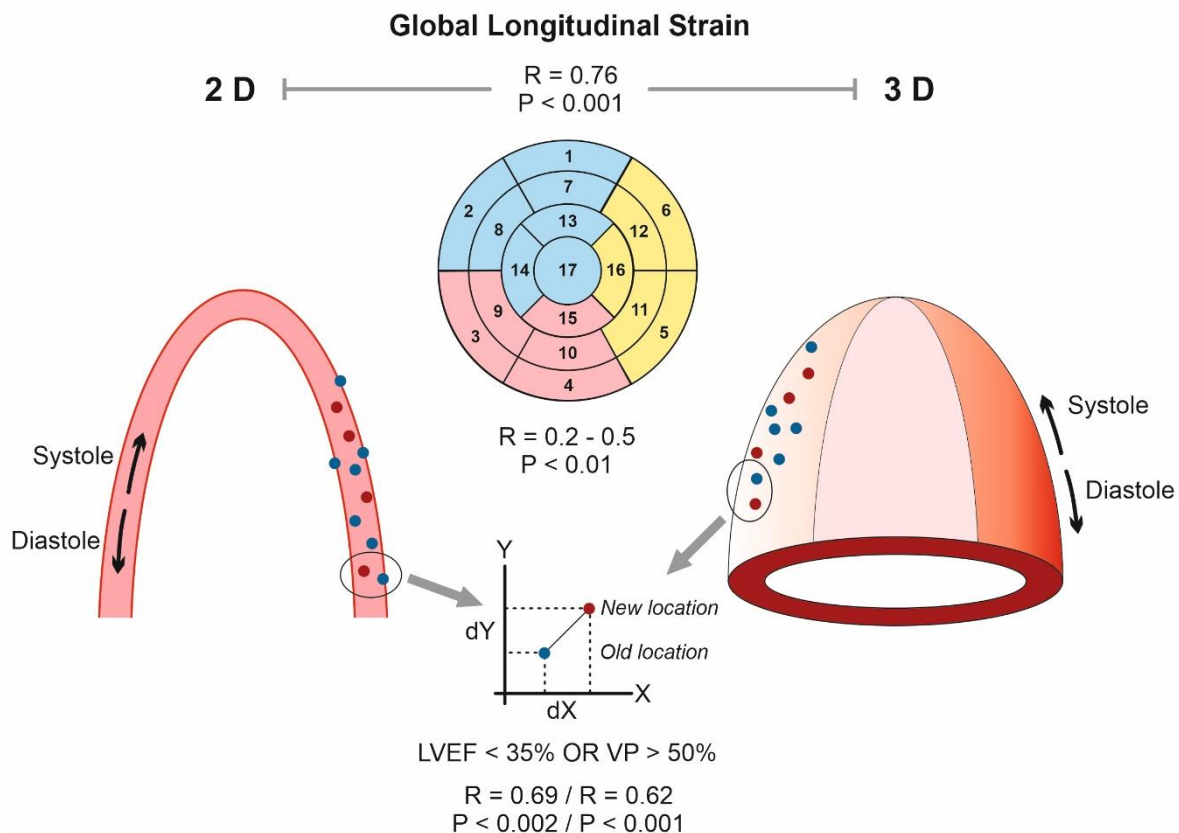
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Agenda

- Úvod do problematiky síňových strainů
- Metody
- Výsledky
- Diskuze
- Závěr

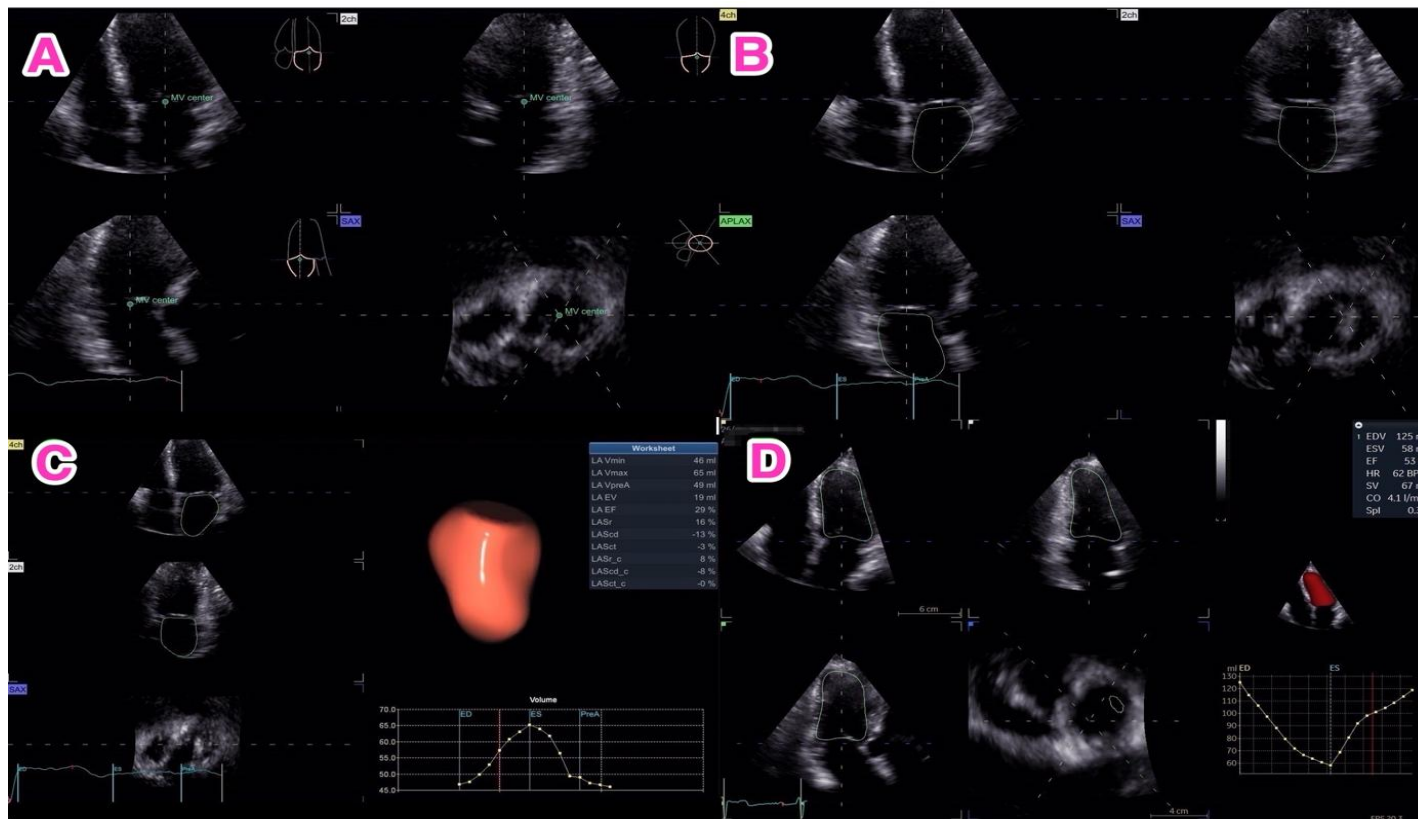
Strainy obecně



VP, Ventricular Pacing; LVEF, Left Ventricular Ejection Fraction; P, hladina významnosti;

Plášek J et al. J Clin Med
2022;11(9):2402

Segmentace 3D strainů (LAQ)



Popis souboru

	Total population	Males	Females	P-value
	N = 116	N = 58	N = 58	
Age (years)	76.9±11.2	74.5±12.2	79.3±9.6	0.048
Males (%)	50	-	-	
Body weight (kg)	78.9±14	83.9±13.6	74±12.7	<0.0001
Body height (cm)	168.8±7.6	175.5±7.5	162.1±5.8	<0.0001
Body mass index (kg/m ²)	27.7± 4.4	27.2±3.8	28.2±4.8	0.170
Body surface area (m ²)	1.9±0.2	2±0.19	1.82±0.17	<0.0001
LV ejection fraction (%)	52.2±13.5	48.8±14.1	54.9±12.4	0.01
Hypertension (%)	90.5	72.4	79.3	0.56
Atrial fibrillation (%)	53	56.9	50	0.577
Dyslipidemia (%)	53	44.8	48.3	0.852
Diabetes mellitus (%)	31	29.3	32.8	0.841
Previous stroke/TIA (%)	8.6	12.1	5.2	0.322
Coronary artery disease (%)	38	50	25.9	0.012
Peripheral arterial disease (%)	22.4	24.1	20.7	0.824
NYHA class I (%)	68.1	58.6	77.6	0.051

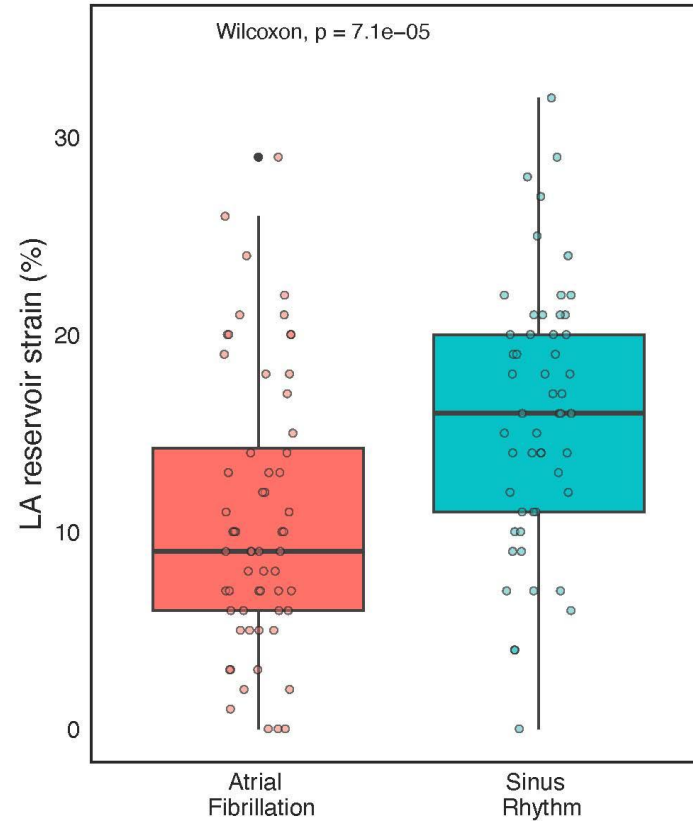
Výsledková tabulka 1

VARIABLE	N=116	ATRIAL FIBRILLATION PRESENT					ATRIAL FIBRILLATION ABSENT				
		N=62	P-value*	HF+ (N=19)	HF- (N=43)	P-value	N=54	HF+ (N=11)	HF- (N=43)	P-value	
LA min	40.5±21.7	47.2±23.4	<0.0001	56.6±29	43±19	0.034	32.8±16.7	39.6±23.4	31.1±14.3	0.132	
LA max	66.2±26.3	72.9±27.8	0.003	85.8±34.3	67.2±22.6	0.014	58.4±22.2	60.8±26	57.8±21.5	0.695	
LA3Dmean	53.3±23.6	60±25.3	0.001	71.2±31.7	55.1±20.3	0.019	45.6±19.1	50.2±24.4	44.5±17.6	0.377	
LA3DMindex	28±12.3	31±13.4	0.003	35±15	29.3±12.6	0.127	24.3±9.7	28±12.5	23.3±8.8	0.152	
LA EV	25.5±9.4	25.6±9.4	0.979	29.3±8	24±9.6	0.036	25.5±9.5	21.1±6.7	26.6±9.8	0.084	
LA EF	40.7±11.7	37±11.6	<0.0001	36.3±8.7	37.3±12.8	0.743	44.9±10.3	38±12.4	46.7±9	0.01	
LASr	13±7.4	10.5±7.1	<0.0001	8.1±5.4	11.4±7.5	0.095	16±6.7	13.2±6.3	16.7±6.7	0.121	
LAScd	-7.2±4.6	-7.2±4.3	0.943	-6.7±3.6	-7.3±4.6	0.61	-7.2±5	-3.9±4.5	-8.1±4.7	0.011	
LASct	-5.8±7.3	-3.4±6.6	<0.0001	-1.4±6.1	-4.2±6.7	0.132	-8.7±7.2	-9.1±7.7	-8.5±7.1	0.825	
LASr_c	16.3±11.5	12.9±10.6	<0.0001	11±9.3	13.7±11.1	0.374	20.3±11.4	14.3±10	21.9±11.3	0.047	
LAScd_c	-7±6.2	-6.7±5.8	0.761	-7.6±4.3	-6.4±6.4	0.485	-7.1±6.6	-3.4±4.4	-8.1±6.8	0.034	
LASct_c	-9.4±10.8	-6.15±10.6	0.001	-3.3±10.1	-7.3±10.7	0.182	-13.1±10	-10.7±10.1	-13.7±10	0.392	
LA_vol	68±33	76.3±33.3	0.003	89.2±4	70.6±28.6	0.042	58.5±30	58.7±31.1	58.5±30.1	0.987	
LAVI	35.6±17	39.5±17.6	0.007	43.9±19.1	37.6±16.8	0.197	31±15.2	32.8±16.2	30.6±15.1	0.662	
LAD	41.8±5.7	43.7±5.6	<0.0001	46.9±6	42.3±5	0.002	39.7±5	40.4±6.6	39.5±4.6	0.620	
LAP_est	18.1±20.3	21±27.2	0.125	20.1±4.9	21.4±33.3	0.866	15±7	17±8.7	14.5±6.6	0.299	
LV EF	51.8±13.6	50.3±13.2	0.191	34.3±5.5	57.4±8.4	<0.0001	53.6±14	30±7.7	59.7±7	<0.0001	
LVIDd	56.2±40.1	60.3±54.3	0.240	60.3±6.2	60.3±65.4	0.999	51.5±6.4	56.1±9.2	50.4±5	0.007	

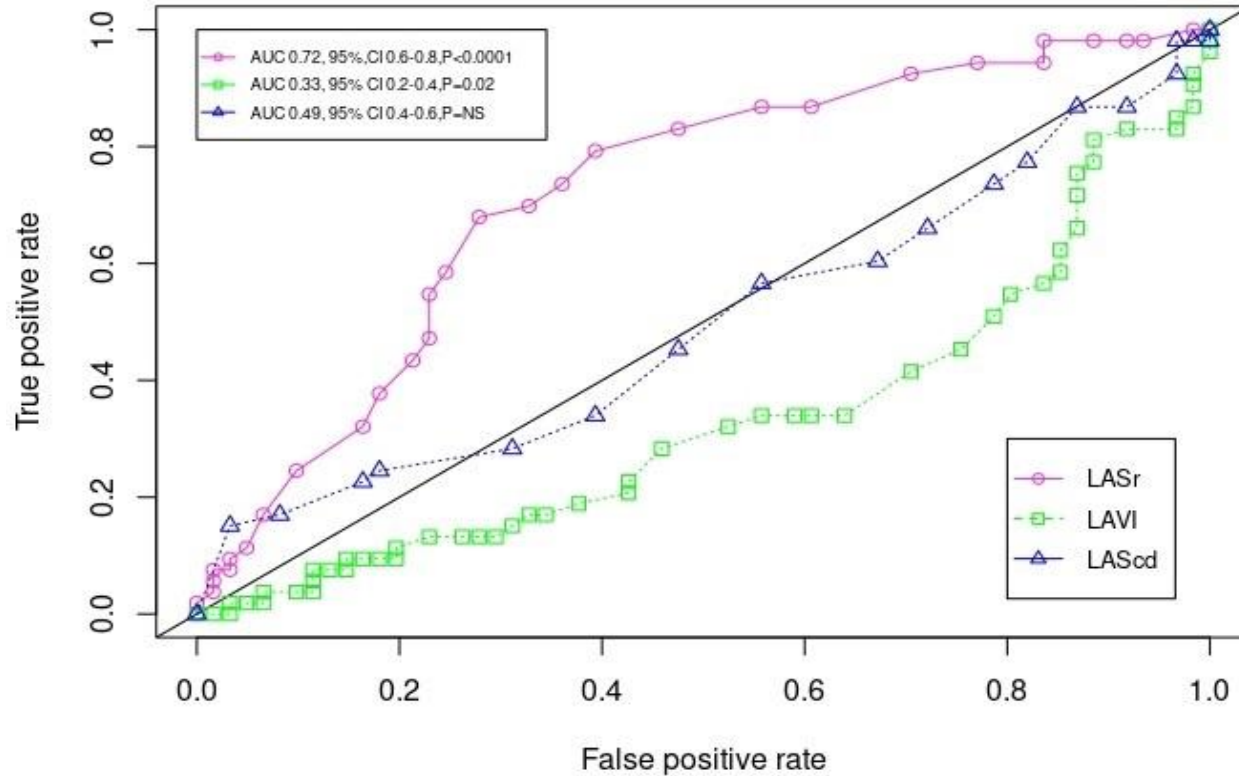
Výsledková tabulka 2

VARIABLE	UNIVARIATE			MULTIVARIATE			BINARY LOGISTIC REGRESSION			
	Mean square	F	P-value	Mean square	F	P-value	OR	95% CI lower	95% CI upper	P-value
LA min	5936.473	14.08	<0.0001	5234.048	12.527	0.001	0.8	0.42	1.52	0.492
LA max	6020.345	9.353	0.003	5109.915	8.147	0.005	1.29	0.67	2.48	0.451
LA EV	0.061	0.001	0.979	N/A	N/A	N/A	0.82	0.45	1.5	0.521
LA EF	1813.124	14.901	<0.0001	1623.484	12.783	0.001	0.94	0.81	1.1	0.428
LASr	864.792	18.043	<0.0001	789.363	16.380	<0.0001	0.32	0.11	0.96	0.042
LA Scd	0.111	0.005	0.943	N/A	N/A	N/A	0.33	0.11	0.97	0.044
LA Sct	796.539	16.877	<0.0001	731.546	14.908	<0.0001	0.34	0.12	1.01	0.053
LASr_c	1567.914	13.027	<0.0001	1494.526	12.349	0.001	0.43	0.17	1.1	0.076
LA Scd_c	3.607	0.093	0.761	N/A	N/A	N/A	0.41	0.16	1.06	0.065
LA Sct_c	1353.752	12.666	0.001	1187.842	11.211	0.001	0.43	0.17	1.1	0.074
LA volume	9120.454	8.995	0.003	8028.636	8.058	0.005	0.99	0.73	1.34	0.963
LAVI	2074.866	7.571	0.007	1588.810	6.275	0.014	1	0.56	1.8	0.999
LAD	463.726	16.084	<0.0001	343.386	12.819	0.001	1.1	0.98	1.3	0.099
LVIDd	2227.741	1.392	0.240	N/A	N/A	N/A	1.01	0.96	1.1	0.627
LA3Dmean	5978.336	11.708	0.001	5171.795	10.337	0.002	N/A	N/A	N/A	N/A
LA3Dmean_i	1324.782	9.435	0.001	1005.750	7.688	0.007	0.92	0.45	1.9	0.824
LAP estim	974.166	2.385	0.125	994.702	2.392	0.125	1.1	0.96	1.1	0.556
Age	805.590	6.774	0.01	709.718	5.780	0.018	1.03	0.99	1.1	0.128

LASr ve vztahu k parox.FS

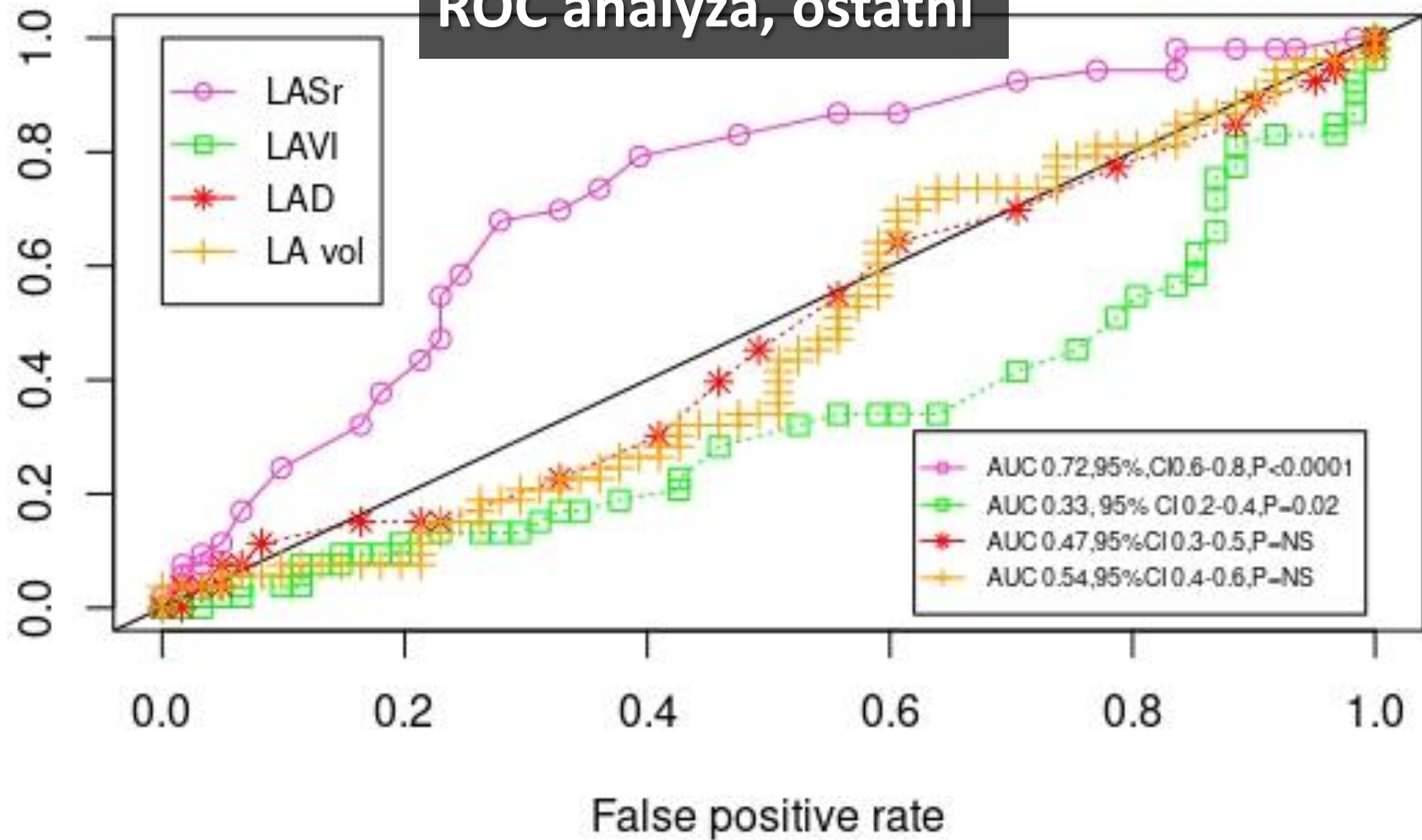


ROC analýza pro LASr

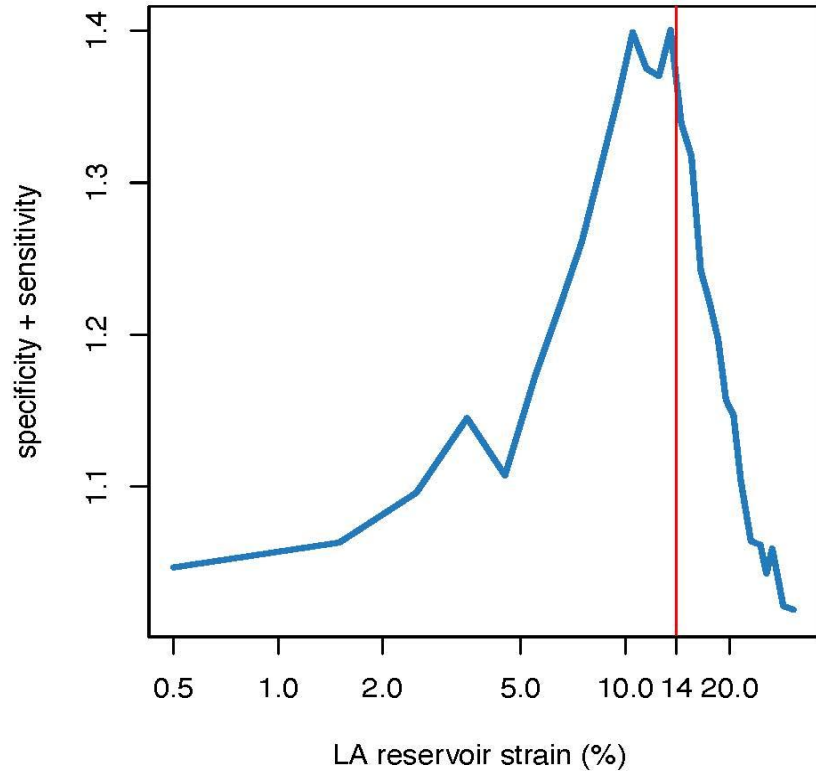


ROC analýza, ostatní

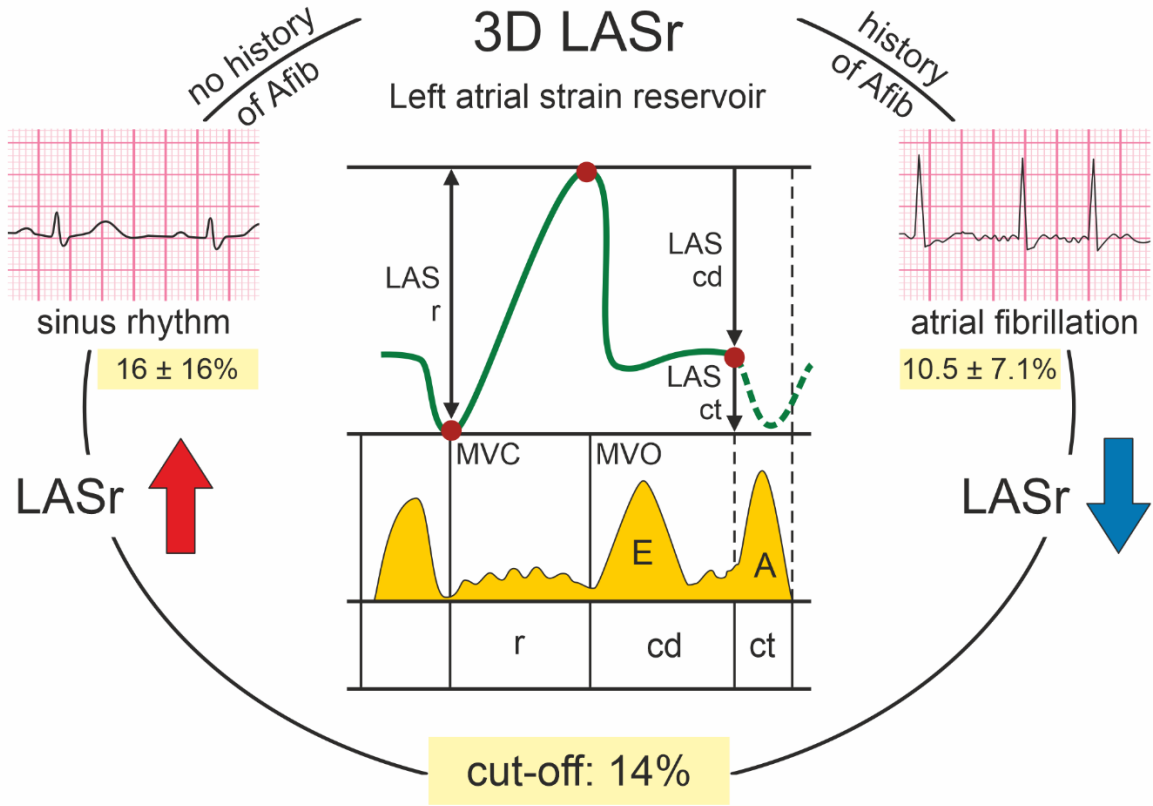
True positive rate



The best threshold values



Youden index



Diskuze

- Snížená LA EF výrazně zvyšuje riziko NOAF
- Zvýšená LA EF (i ve FS) predikuje udržení SR za 12M
- U populace pacientů s ALCA LASr vedl k diskriminaci pacientů s NOAF a bez
- U pacientů s HF LASr dobře koreluje s NT-pro-BNP/klinickými epizodami zhoršení HF

1. Abhayaratma WP et al. *Am J Cardiol* 2008;101(11): 1626-9. 2. Walek P et al. *Plos One* 2020;15(8):e0238002. 3. Choi Y et al. *Eur Heart J Cardiovasc Imaging* 2023;24(6):751-758 4. Bouwmeester S et al. *BMC Cardiovasc Disord* 2022;22: 104.

Závěr

- **3D LASr (v SR) : diferenciace pacientů s PAF**
- **Predikce PAF: 72% specificita, 68% sensitivita, cut-off 14%**
- **Funkční parametr v.s. strukturální remodelace**
- **Snížená hodnota LASr odpovídá pravděpodobně pokročilosti atriální kardiomyopatie**