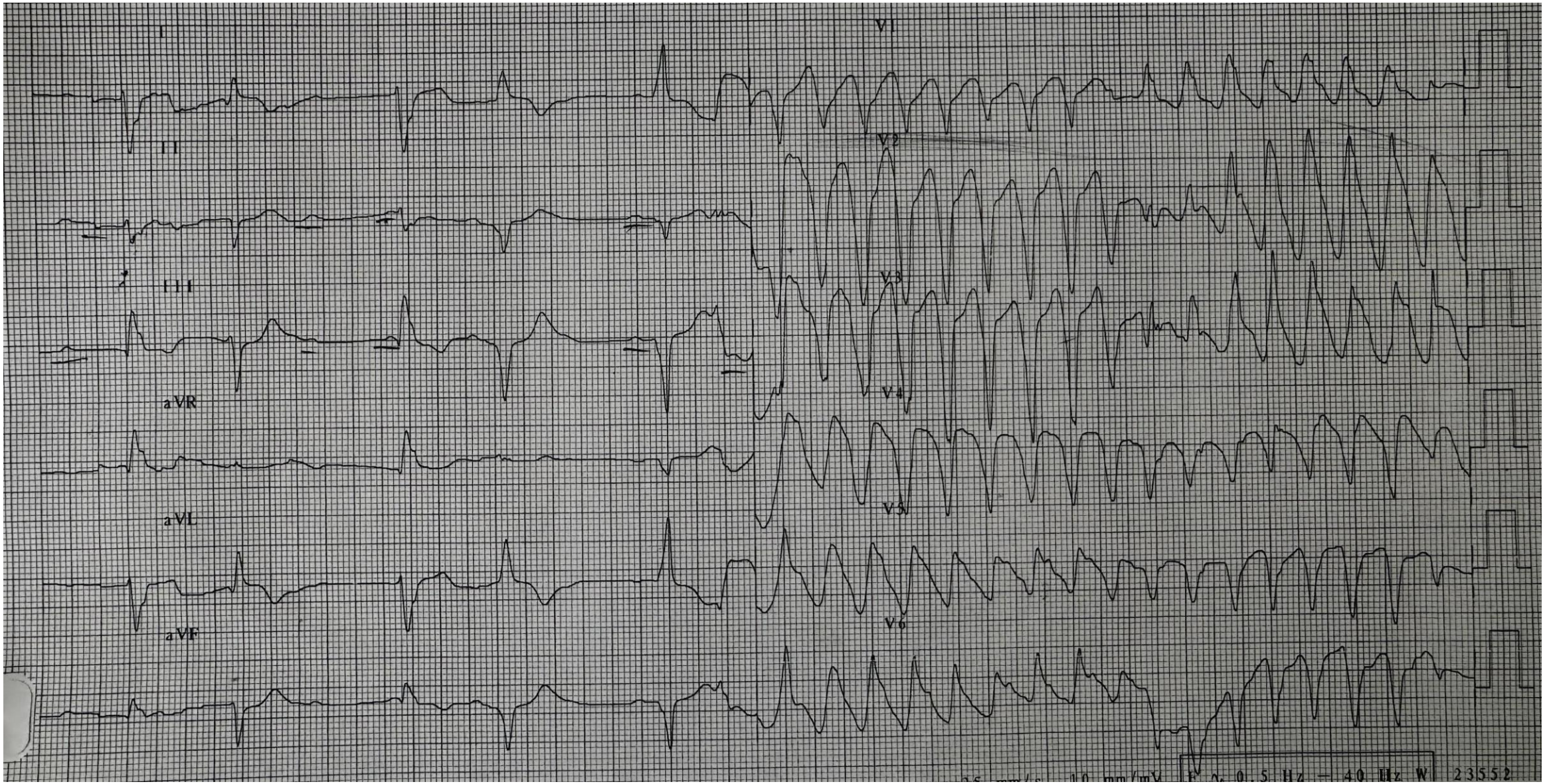
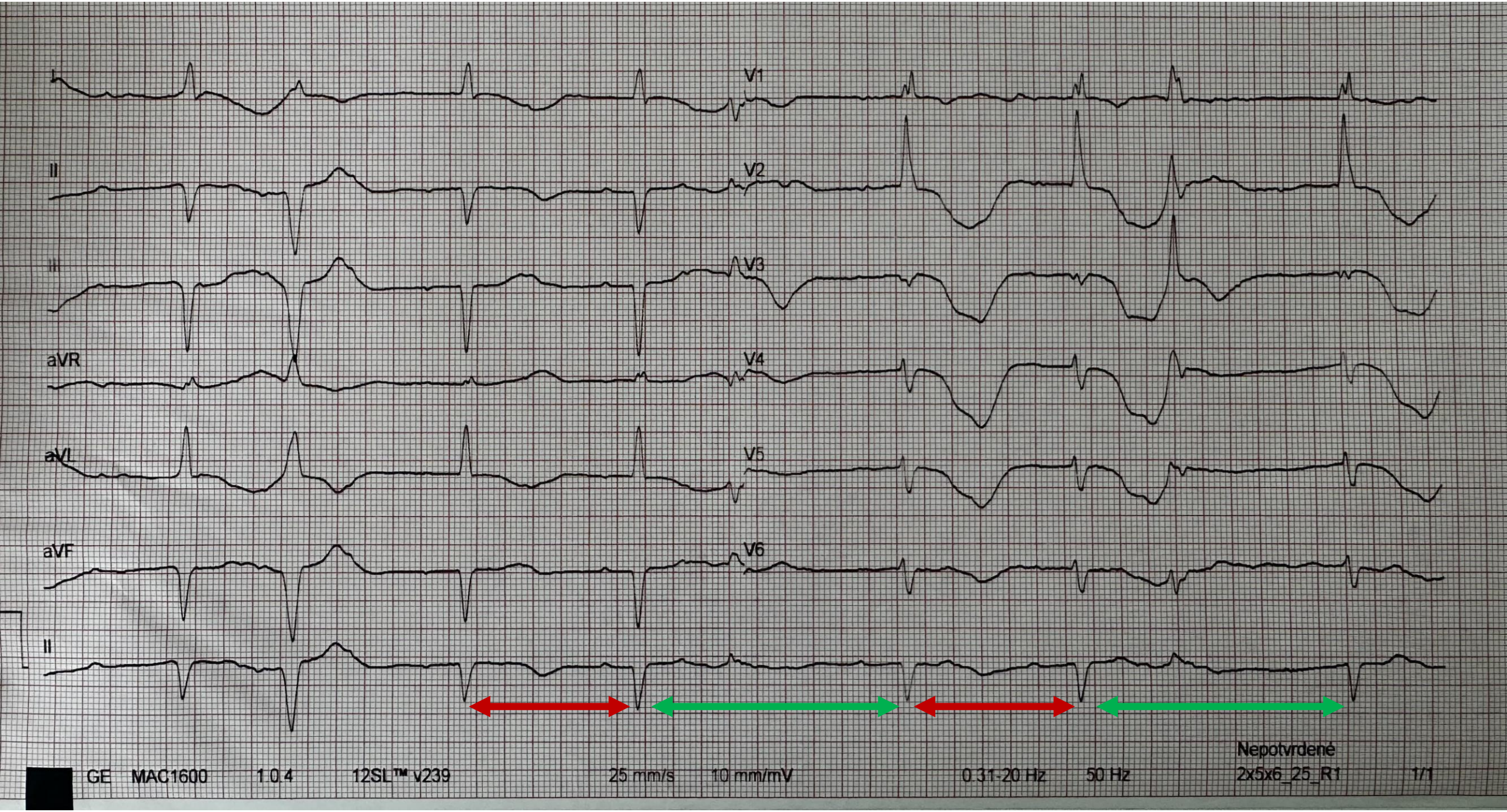
Smrtiace kyvadlo

Jakub Marko

Lekár Oddelenia arytmií


I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
2
23552


I
II
III
aVR
aVL
aVF
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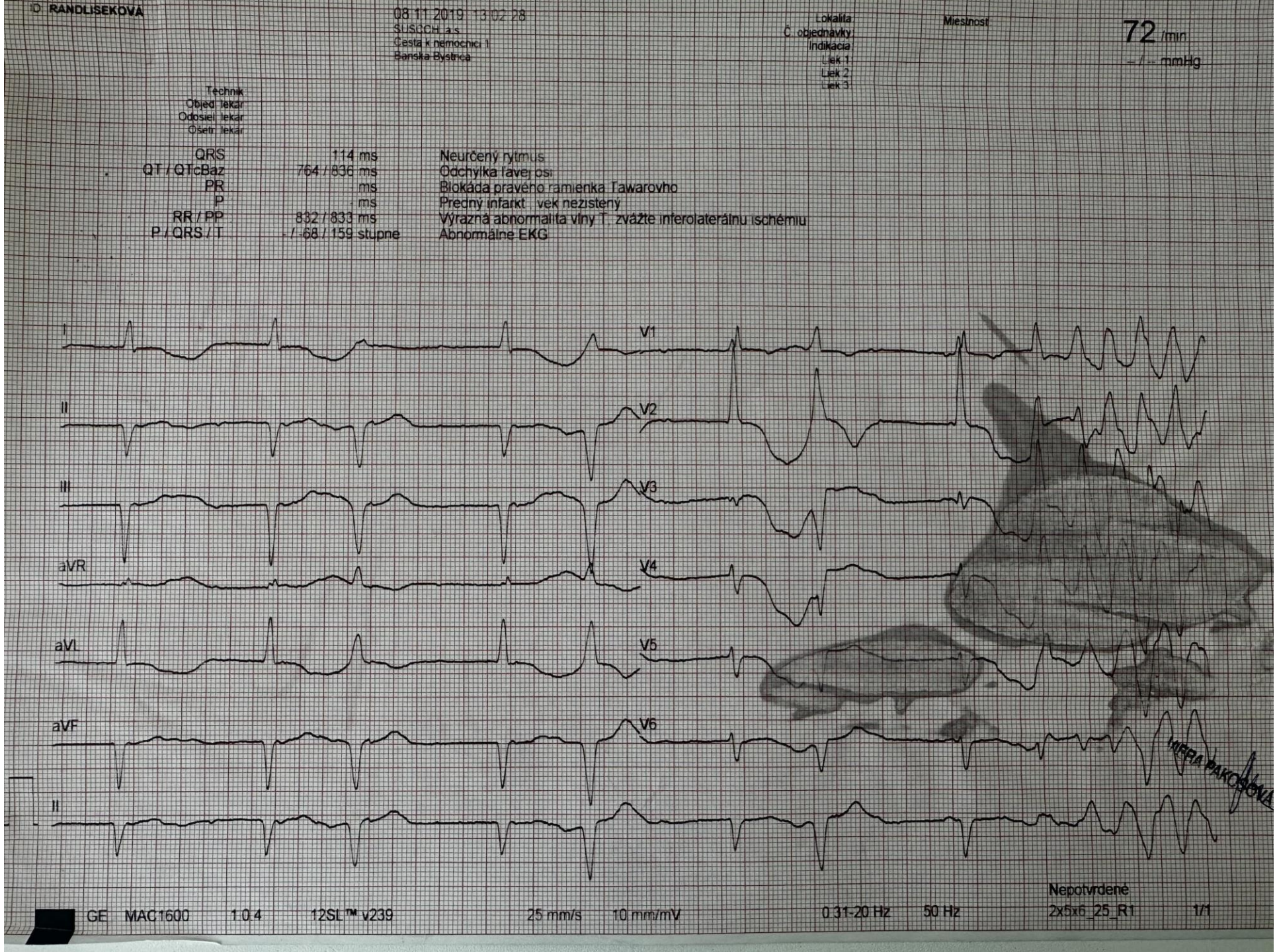
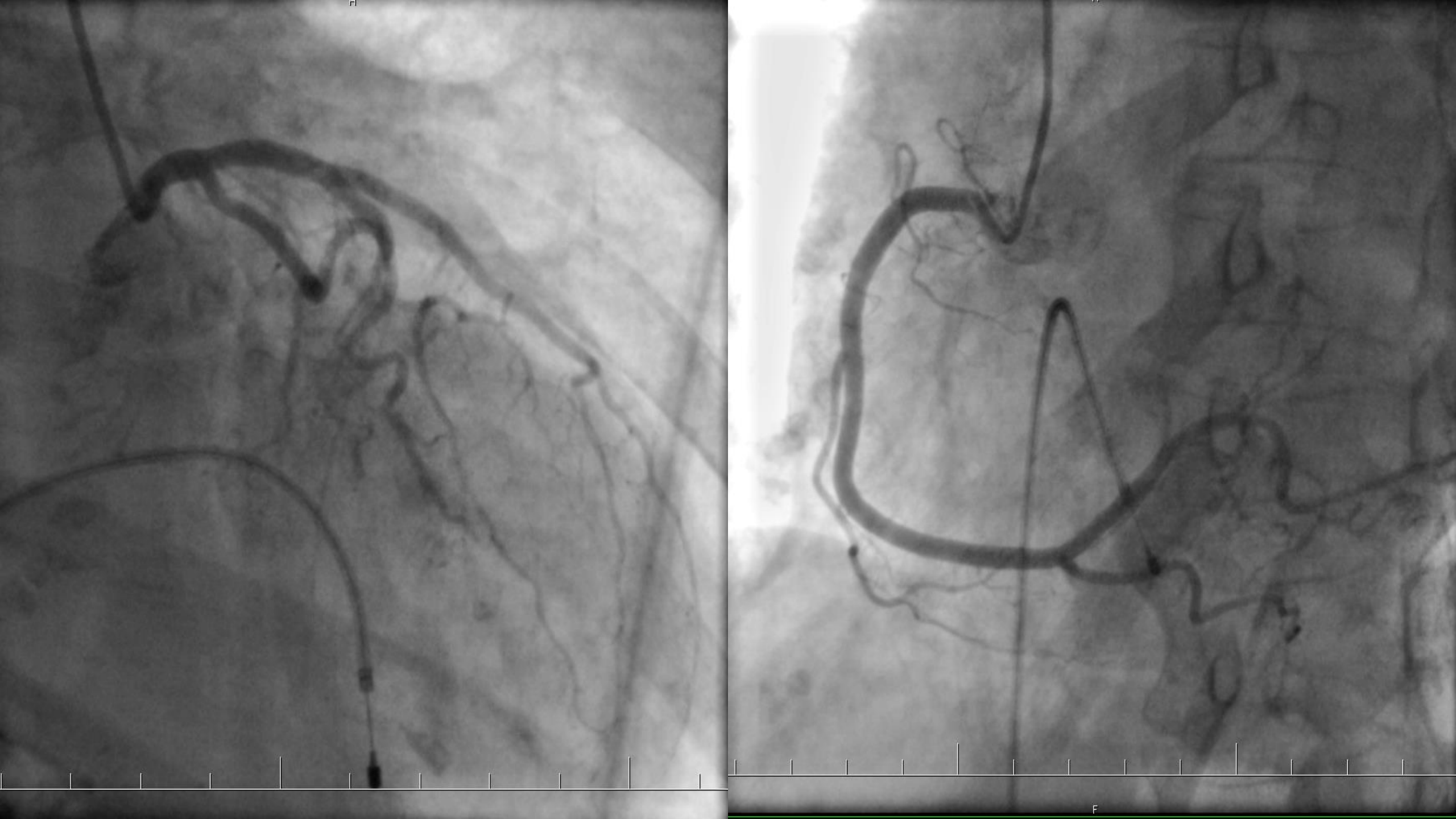
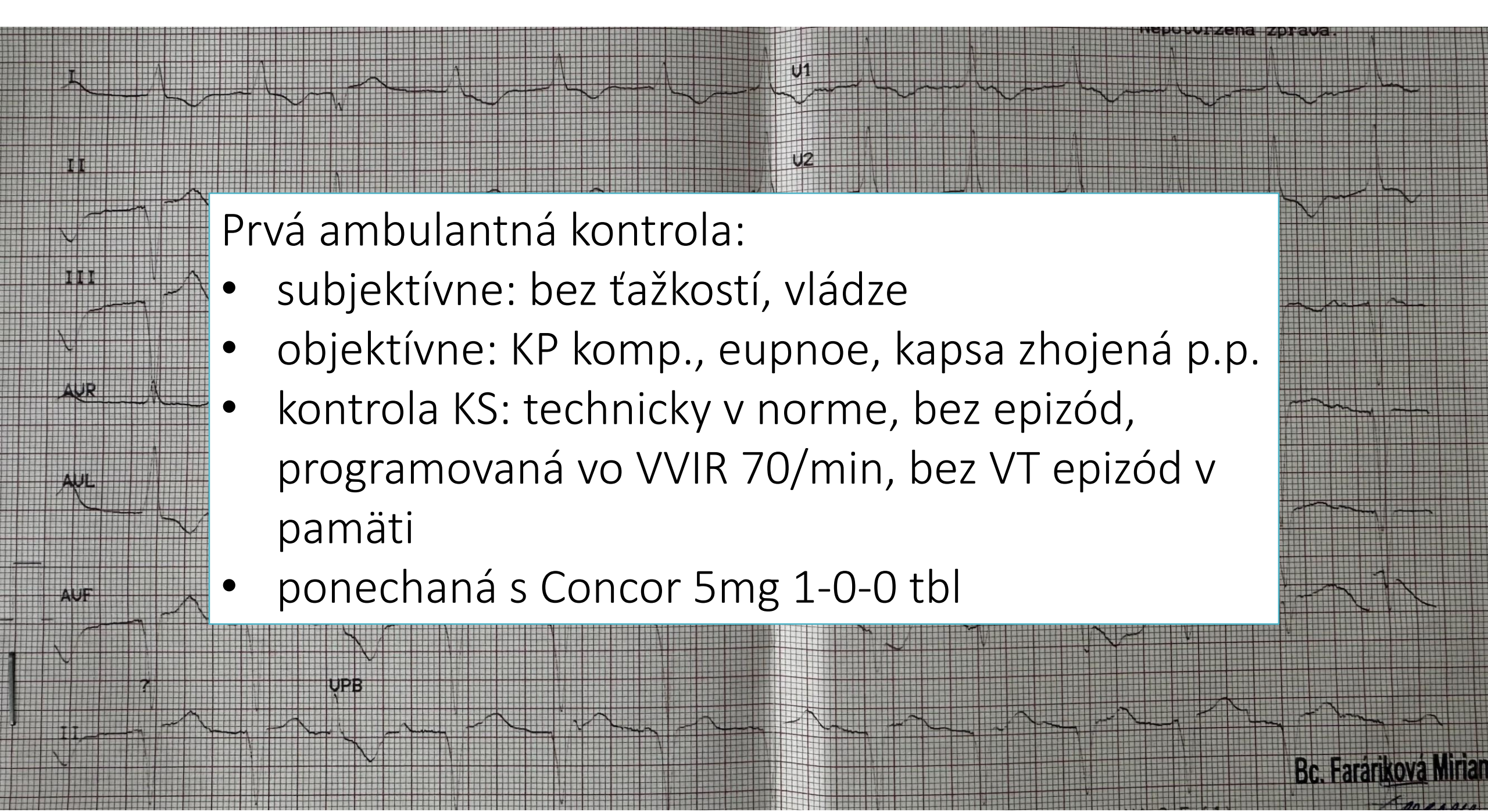
II
GE MAC1600 1 0.4 12SL™ v239 25 mm/s 10 mm/mV 0.31-20 Hz 50 Hz
Nepotvrdené
2x5x6_25_R1 1/1


ID RANDLISEKOVÁ
08.11.2019 13:02:28
SUSCCH, a.s.
Cesta k nemocnici 1
Banska Bystrica
Lokalita
Č. objednávky
Indikácia
Liek 1
Liek 2
Liek 3
Miestnosť
72 /min
-- / -- mmHg
Technik
Objed. lekár
Odosiel. lekár
Ošetr. lekár
QRS 114 ms
QT / QTcBaz 764 / 836 ms
PR ms
P ms
RR / PP 832 / 833 ms
P / QRS / T - / -68 / 159 stupne
Neurčený rytmus
Odchýlka ľavej osi
Blokáda pravého ramienka Tawarovho
Predný infarkt - vek nezistený
Výrazná abnormalita vlny T, zvážte inferolaterálnu ischémiu
Abnormálne EKG
I
II
III
aVR
aVL
aVF
II
V1
V2
V3
V4
V5
V6
MARIA PAKOŠOVÁ
Nepotvrdené
GE MAC1600 1.0.4 12SL™ v239 25 mm/s 10 mm/mV 0.31-20 Hz 50 Hz 2x5x6_25_R1 1/1



Bradykardiou indukovaná polymorfná komorová tachykardia v teréne bilaterálnej bronchopneumónie s kardiálnou dekompenzáciou

- doplnený RTG, s nálezom atelektatických zmien vpravo, fluidothorax bilat. so zníženou transparenciou v hornej časti bilaterálne, dominantne vpravo
- leukocytóza 18x10^9/l, CRP 78mg/l, hsTN 232ng/l, mineralogram aj tyreostatus v norme
- bedside echo: LP 35mm, LV EDD 46mm, EF ĽK 45-50%, apikoseptálna hypokinéza, IVS aj ZS 11mm, trikuspidálna aj mitrálna regurgitácia do 2. stupňa, sPAP 65mmHg, TAPSE 22, zachovaná funkcia PK, nedilatované pravostranné oddiely
- vzhľadom na vek a zápalový stav implantovaný komorový kardiostimulátor, pridaný betablokátor, empirické ATB

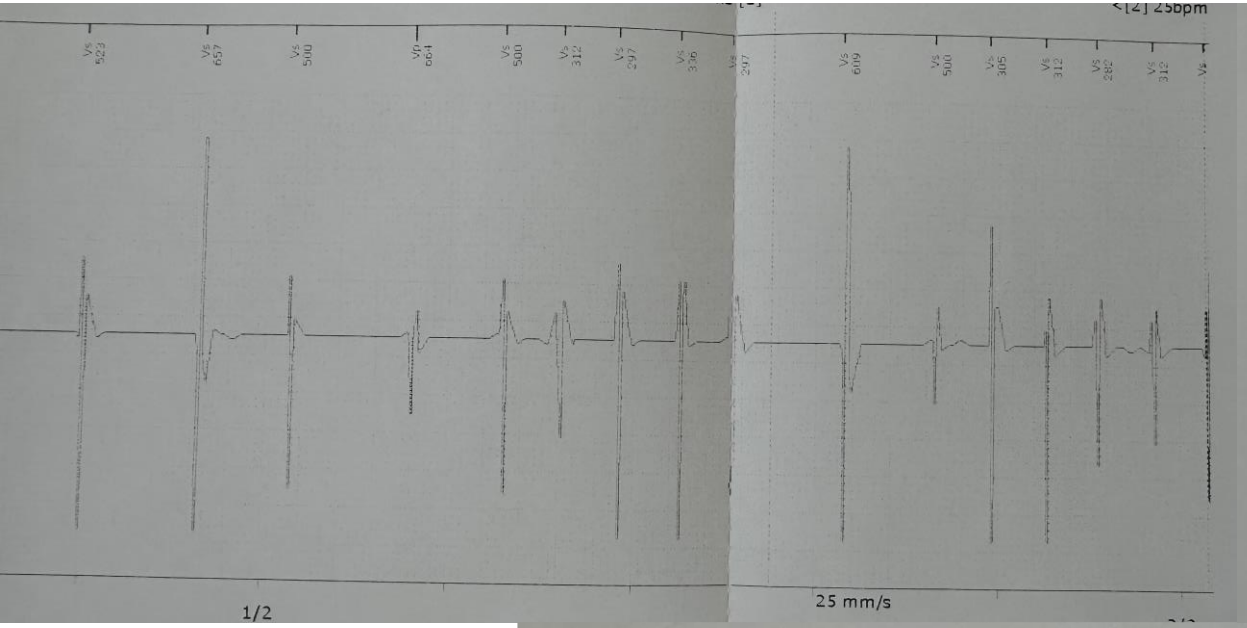


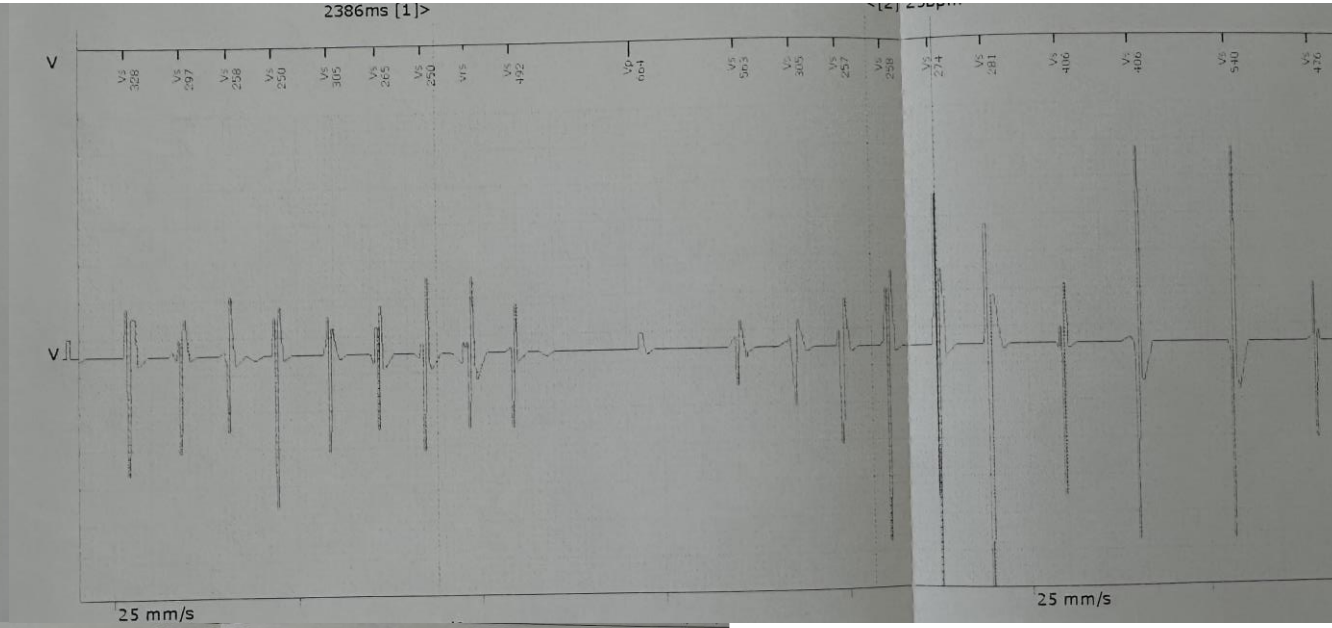
Prvá ambulantná kontrola:

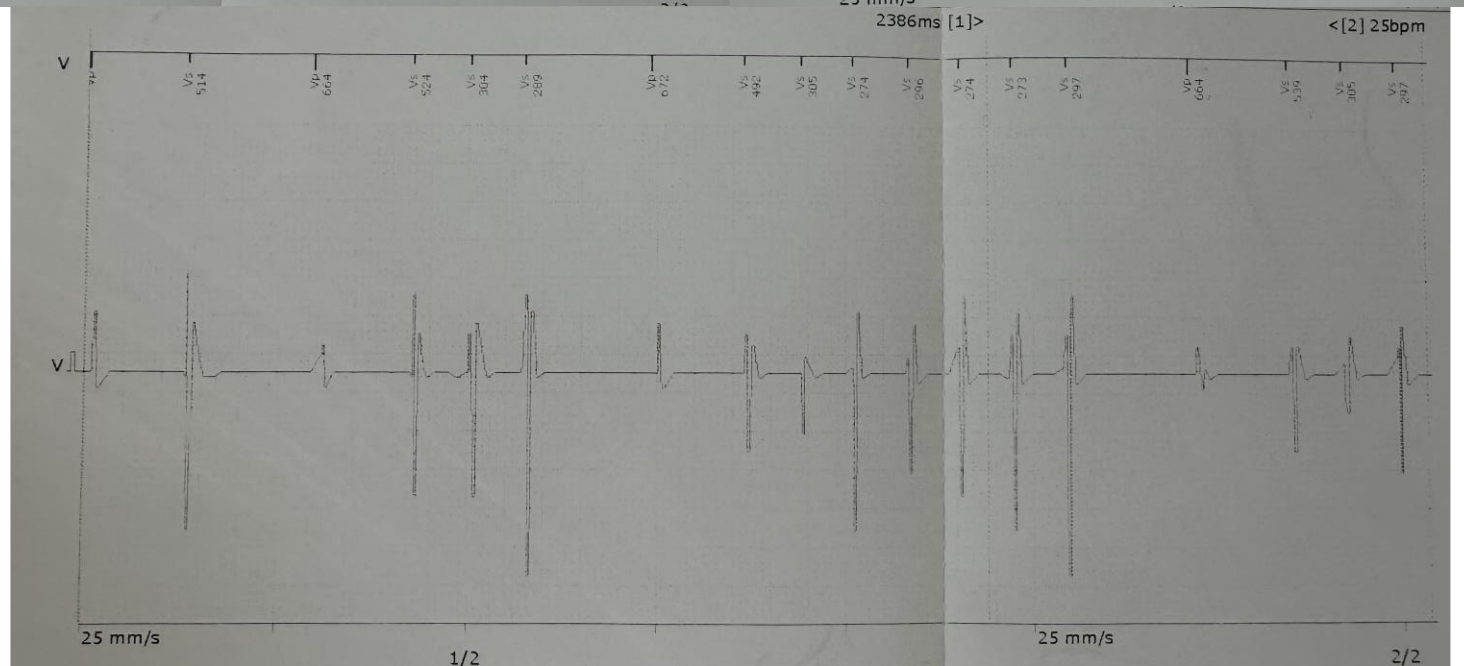
- subjektívne: bez ťažkostí, vládze
- objektívne: KP komp., eupnoe, kapsa zhojená p.p.
- kontrola KS: technicky v norme, bez epizód, programovaná vo VVIR 70/min, bez VT epizód v pamäti
- ponechaná s Concor 5mg 1-0-0 tbl

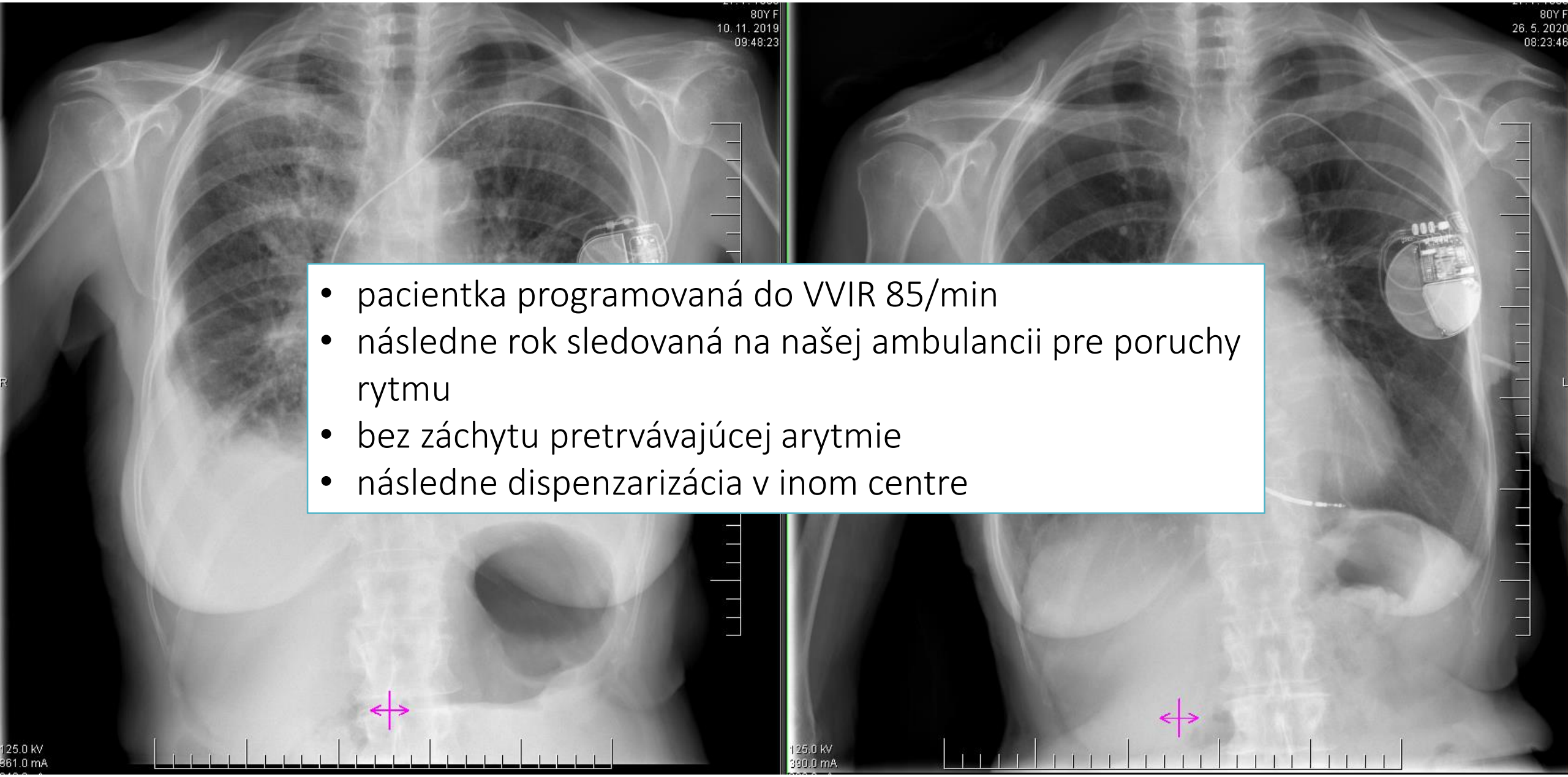
Telefonicka konzultácia zo spádu:

- pacientka hospitalizovaná pre paroxyzmy nepretrvávajúcej aj pretrvávajúcej polymorfnej komorovej tachykardie s nutnosťou KPCR, v spáde navýšená bazálna stimulačná frekvencia na 90/min
- tachykardie nevznikali v teréne bradykardií
- iniciované KES
- EchoKG: pokles EF ĽK na 35%, apikoseptálna dyskinéza, ostatný nález statický
- labs: prakticky všetko v norme, v spade elevované NTproBNP neznámej hodnoty
- indikovaný upgrade na ICD


1/2
25 mm/s

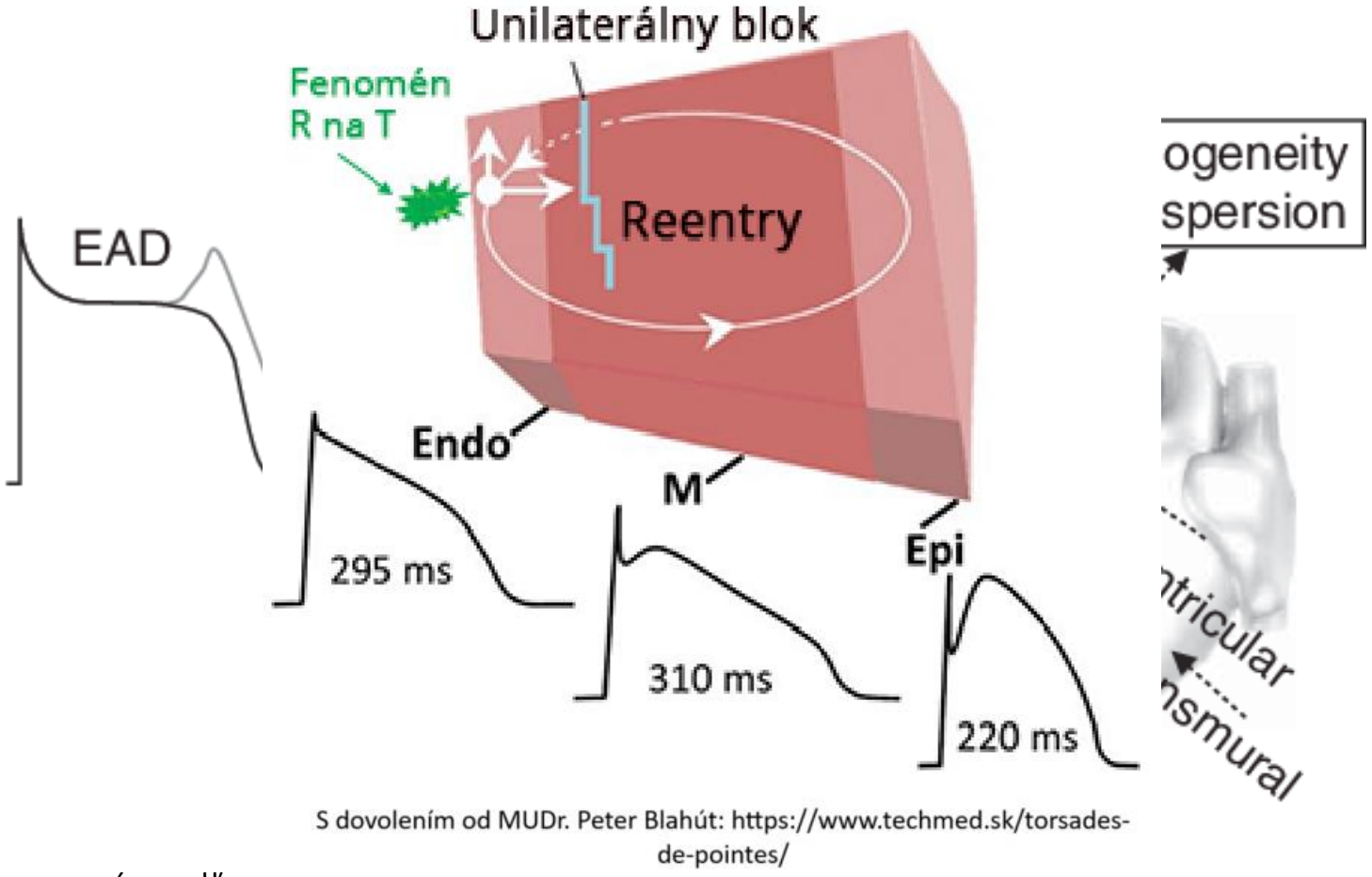

2386ms [1]>
V
25 mm/s
25 mm/s


2386ms [1]>
<[2] 25bpm
V
25 mm/s
1/2
25 mm/s
2/2



- pacientka programovaná do VVIR 85/min
- následne rok sledovaná na našej ambulancii pre poruchy rytmu
- bez záchytu pretrvávajúcej arytmie
- následne dispenzarizácia v inom centre

Mechanizmus vzniku



S dovolením od MUDr. Peter Blahút: https://www.techmed.sk/torsades-de-pointes/

Upravené podľa: Minimizing Repolarization-Related Proarrhythmic Risk in Drug Development and Clinical Practice - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Mechanisms-and-ECG-appearance-of-torsades-de-pointes-TdP-a-Mechanism-of-TdP_fig1_42438282 [accessed 12 Oct 2024]

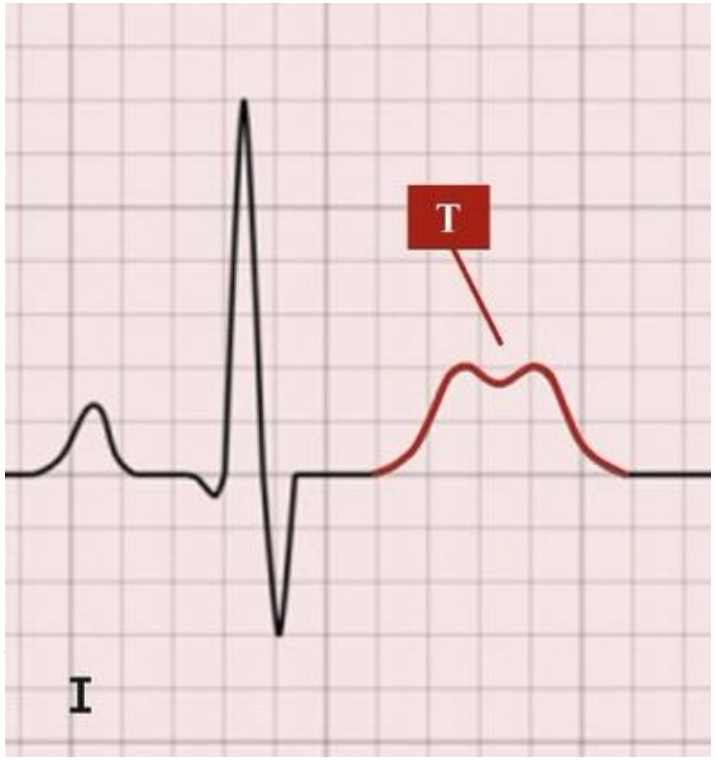
Aktuálny koncept:

- bradykardiou indukované predĺženie QT intervalu
- bradykardiou indukovaná disperzia akčných potenciálov naprieč myokardom
- väčšia šanca na skorú depolarizáciu(fokálnu aktivitu)
- udržiavanie arytmie „phase 2 re-entry“ mechanizmom
- ev. fokálna aktivita z rôznych miest

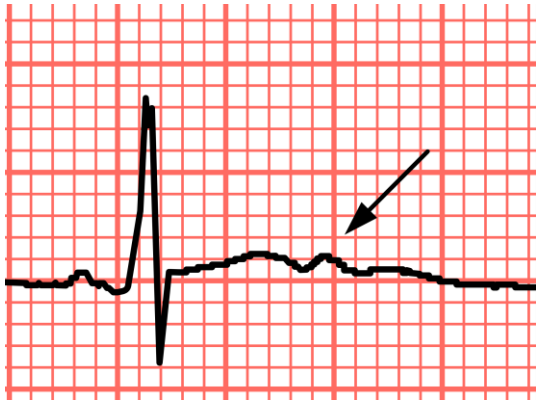
Vandersickel N, de Boer TP, Vos MA, Panfilov AV. Perpetuation of torsade de pointes in heterogeneous hearts: competing foci or re-entry? J Physiol. 2016 Dec 1;594(23):6865-6878. doi: 10.1113/JP271728. Epub 2016 Mar 4. PMID: 26830210; PMCID: PMC5134387.

- ženy
- vyšší vek
- dlhší čas v bradykardii
- atrioventrikulárne blokády v

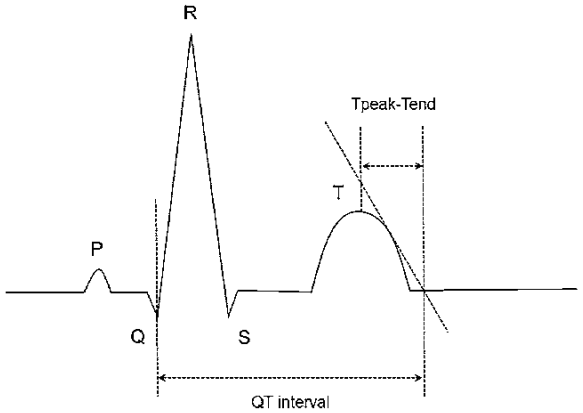
Notchovaná vlna T



Prominentná vlna U

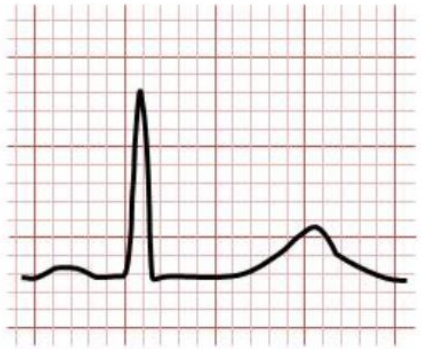


Tpeak-Tend viac ako 85ms



Morfológia QT ako pri LQTS2

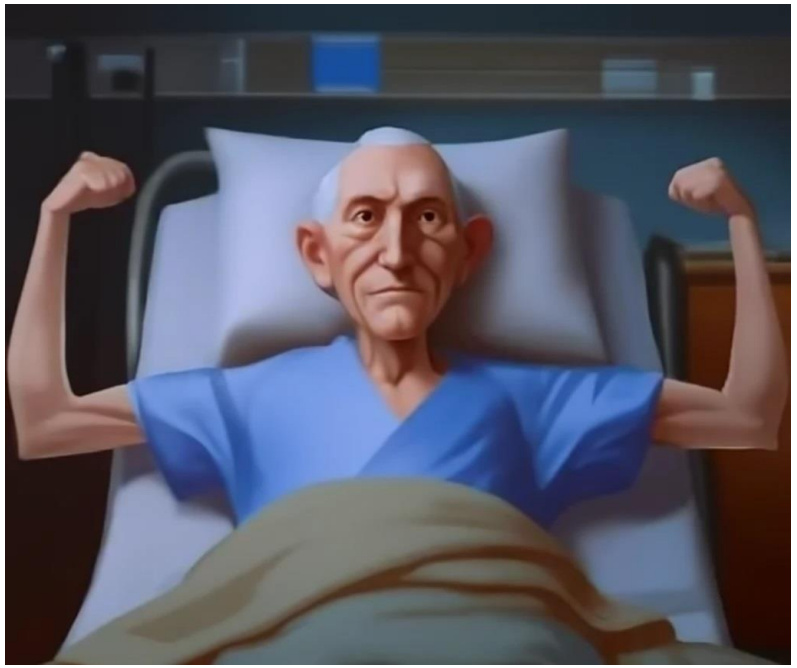
LQT2

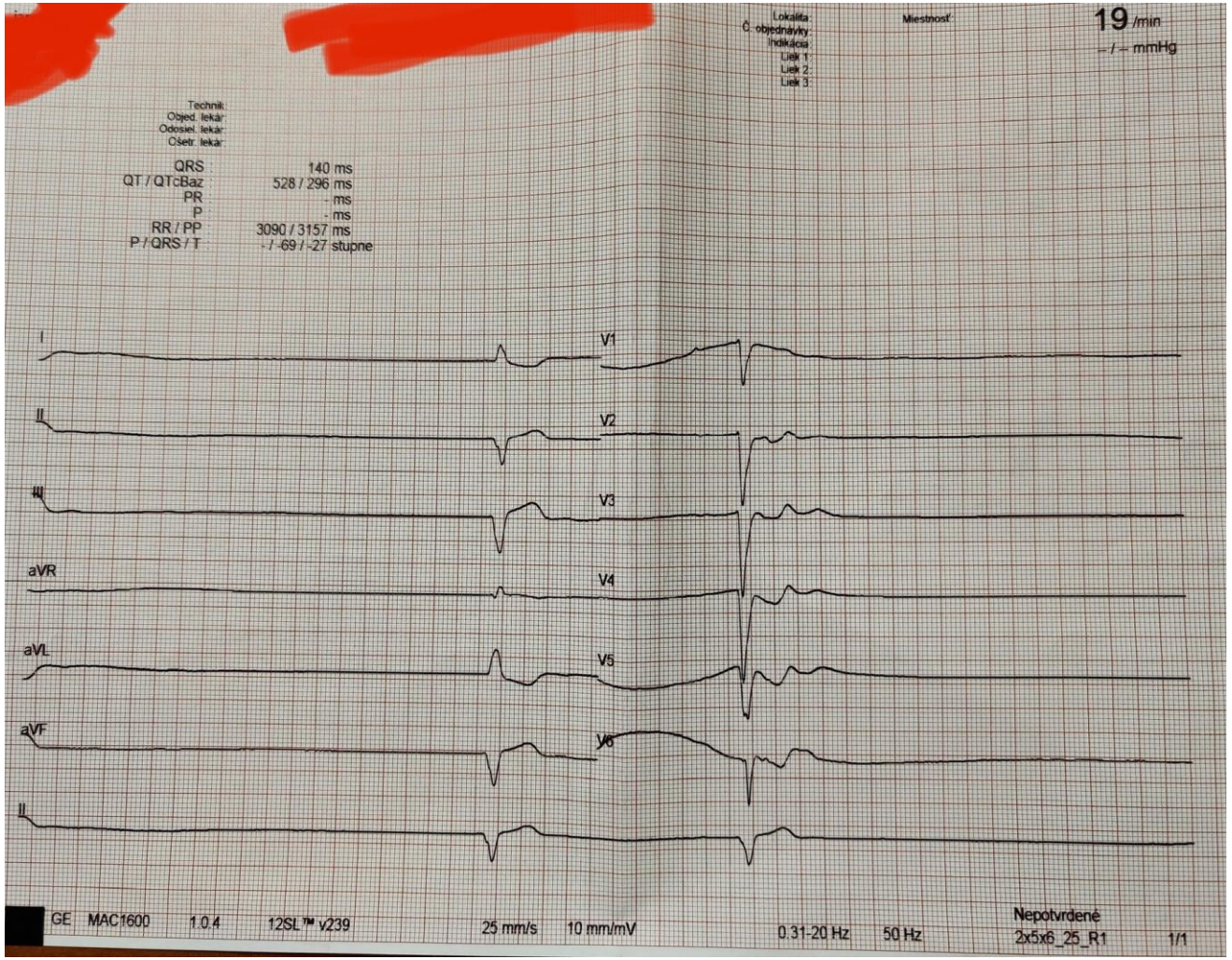


Bozkaya YT, Eroğlu Z, Kayikçioğlu M, Payzin S, Can LH, Kültürsay H, Hasdemir C. Repolarization characteristics and incidence of Torsades de Pointes in patients with acquired complete atrioventricular block. Anadolu Kardiyol Derg. 2007 Jul;7 Suppl 1:98-100. PMID: 17584695.
Namboodiri N, Bradycardia-induced Torsade de Pointes - An arrhythmia Less Understood, Indian Pacing Electrophysiol J. 2010 Oct 31;10(10):435-8. PMID: 21151381; PMCID: PMC2974330.

Realita života

Mám sa dobre, prečo sa pýtate?





Čo hovoria štúdie:

Observational Study > J Cardiovasc Ele

doi: 10.1111/jce.13696. Epub 2018 Aug 23.

Implantable cardiovert
device recipients who s
associated with a rever

Aman Gupta [1], Deepak Kumar Pasupula [1], A
Norman C Wang [2], Evan Adelstein [2], Sande

Affiliations + expand

PMID: 30015993 DOI: 10.1111/jce.13696

Table 2. Putative Transient or Correctable Causes of VT/VF (n = 278)

	n	%
Ischemic events	183	65.8%
New MI	161	57.9%
Non–Q-wave	83	29.9%
Q-wave	78	28.0%
Transient ischemia, no MI	22	7.9%
Other or unknown*	50	17.9%
Electrolyte imbalance	27	9.7%
Antiarrhythmic drug reaction	18	6.5%

MI = myocardial infarction; VF = ventricular fibrillation; VT = ventricular tachycardia.

*

For example, cocaine or illicit drug use, sepsis, hypoxia, electrocution, drowning.

PMID: 11704386 DOI: 10.1016/s0735-1097(01)01597-2

. doi: 10.1016/s0735-1097(01)01597-2.

ıythmias due to
ıigh risk for death in

lson, A B Curtis, A P Hallstrom,

Čo hovoria odporúčania?

ACC/AHA/ESC Guideliny na NKS 2006

2 **Unless electrolyte abnormalities are proved to be the cause, survivors of cardiac arrest due to VF or polymorphic VT in whom electrolyte abnormalities are discovered in general should be evaluated and treated in a manner similar to that of cardiac arrest without electrolyte abnormalities.** ***(Level of Evidence: C)***

3 **Patients who experience sustained monomorphic VT in the presence of antiarrhythmic drugs or electrolyte abnormalities should be evaluated and treated in a manner similar to that of patients with VT without electrolyte abnormalities or antiarrhythmic drugs present. Antiarrhythmic drugs or electrolyte abnormalities should not be assumed to be the sole cause of sustained monomorphic VT.** ***(Level of Evidence: B)***

7.5. Torsades de Pointes

Recommendations

Class I

1 **Withdrawal of any offending drugs and correction of electrolyte abnormalities are recommended in patients presenting with torsades de pointes.** ***(Level of Evidence: A)***

2 **Acute and long-term pacing is recommended for patients presenting with torsades de pointes due to heart block and symptomatic bradycardia.** ***(Level of Evidence: A)***

Class IIa

1 **Management with intravenous magnesium sulfate is reasonable for patients who present with LQTS and few episodes of torsades de pointes. Magnesium is not likely to be effective in patients with a normal QT interval.** ***(Level of Evidence: B)***

2 **Acute and long-term pacing is reasonable for patients who present with recurrent pause-dependent torsades de pointes.** ***(Level of Evidence: B)***

3 **Beta blockade combined with pacing is reasonable acute therapy for patients who present with torsades de pointes and sinus bradycardia.** ***(Level of Evidence: C)***

Čo hovoria odporúčania?

ESC Guideliny na NKS 2022

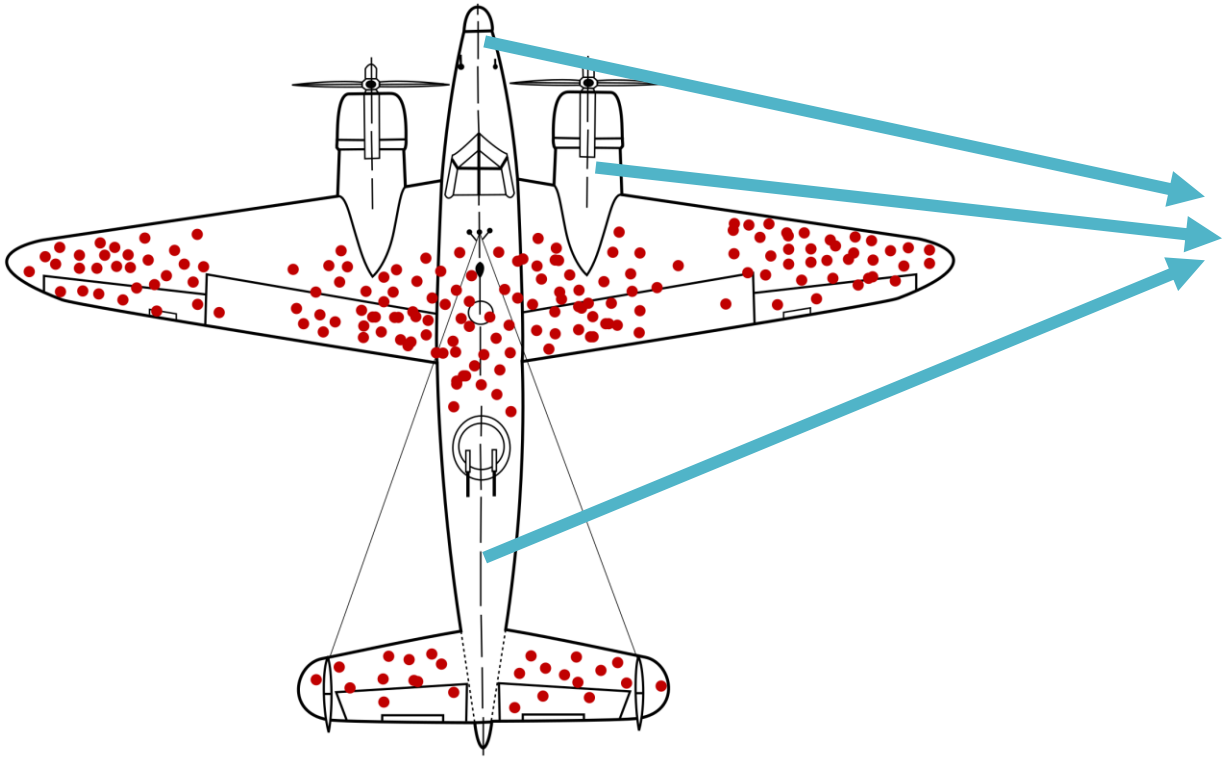
Recommendations	Class[a]	Level[b]
Withdrawal of offending agents is recommended whenever drug-induced VAs are suspected.[293,294,297]	I	B
Investigation for reversible causes (e.g. electrolyte imbalances, ischaemia, hypoxaemia, fever)[c] is recommended in patients with VA.[292,298]	I	C
Despite a possible correctable cause for the presenting VA, the need for ICD implantation should be considered based on an individual evaluation of the risk of subsequent VA/SCD.[286,296,299]	IIa	C

ICD, implantable cardioverter defibrillator; SCD, sudden cardiac death; VA, ventricular arrhythmia.
[a]Class of recommendation.
[b]Level of evidence.
[c]List not exhaustive.

Recommendations	Class[a]	Level[b]
Implantation of a cardioverter defibrillator is only recommended in patients who have an expectation of good quality survival >1 year.	I	C
It is not recommended to implant an ICD in patients with incessant VAs until the VA is controlled.	III	C

Čo hovorí náš register?

Od roku 2020 po očistení od koronárnej choroby srdca, rsp. iných štrukturálnych ochorení upgradovaný v sekundárnej prevencii z kardiostimulátora len 1 pacient.



Kardiostimulátory, ktoré sa „nevrátili“?

Komu čo implantovať?

Kardioverter-defibrilátor

- mladší
- podozrenie na štrukturálne ochorenie
- „nevýrazná bradykardia“
- náhle úmrtie v rodine
- recidivujúce minerálové disbalansy

Kardiostimulátor

- prežívanie menej ako 1 rok
- prežívanie viac ako jeden rok v zlom kl. stave
- prianie pacienta
- nejasná compliance
- cievny prístup

Ďakujem za pozornosť!