Case report from Dr. Olli Arola Tempere Finland. **Case sent by Kjell Nikus**

Dr Olli Arola Cardiologist, electrophysiologist
Heart Center Tampere University Hospital
Finland. Olli.Arola@sydansairaala.fi

Heart Center, Tampere University Hospital. Biokatu 6,
33520 Tampere, Finland. kjell.nikus@kolumbus.fi

55-year old male Prolonged PR interval, ventricular preexcitation and broad irregular QRS tachycardia

In 2000 mitral valve prosthesis for mitral prolapse + regurgitation (normal ECG apart from LVH)

Now sudden onset of palpitations

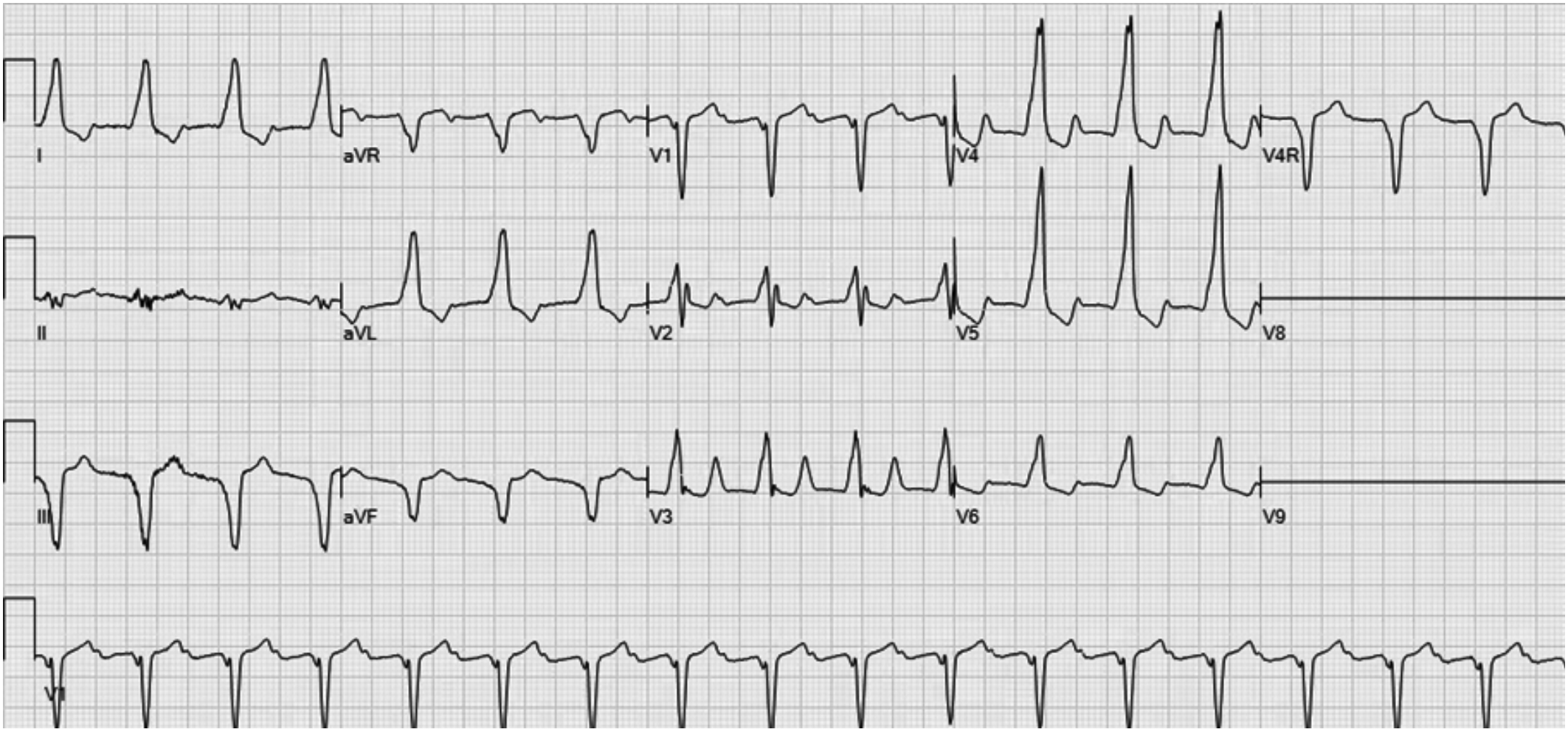
Blood pressure 110/70

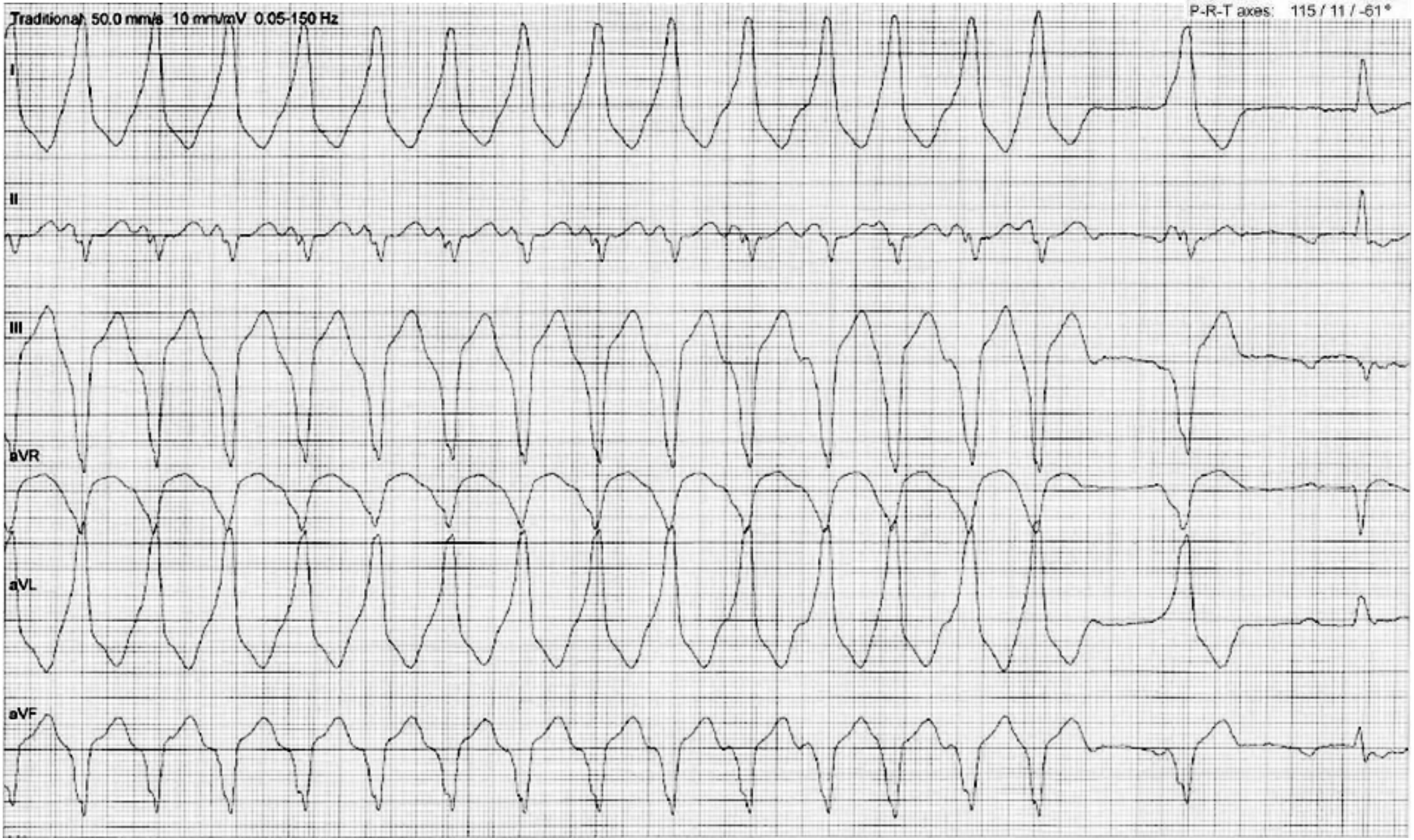
Normal LV function, normal LV diameters post-arrhythmia

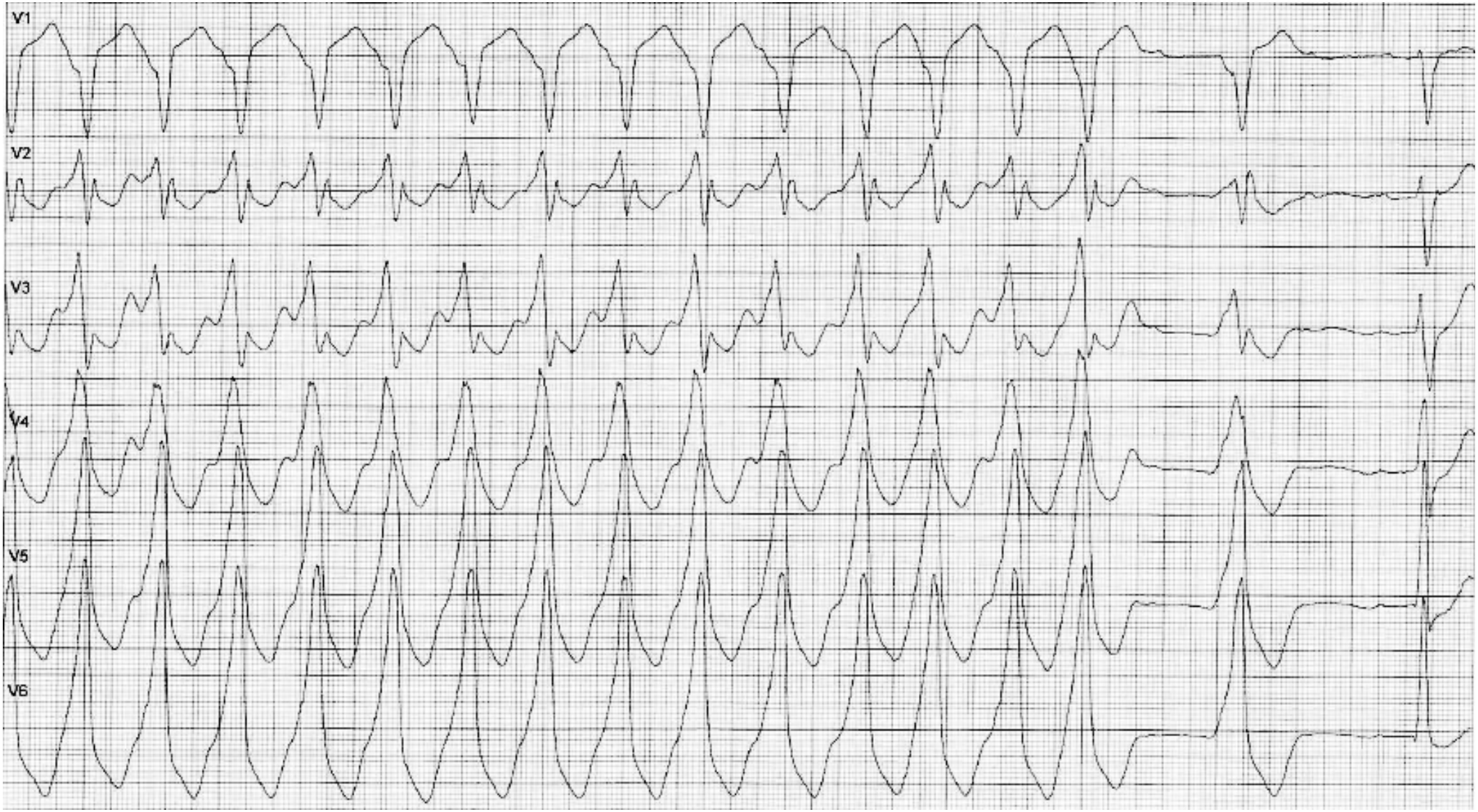
Well-functioning valve prosthesis

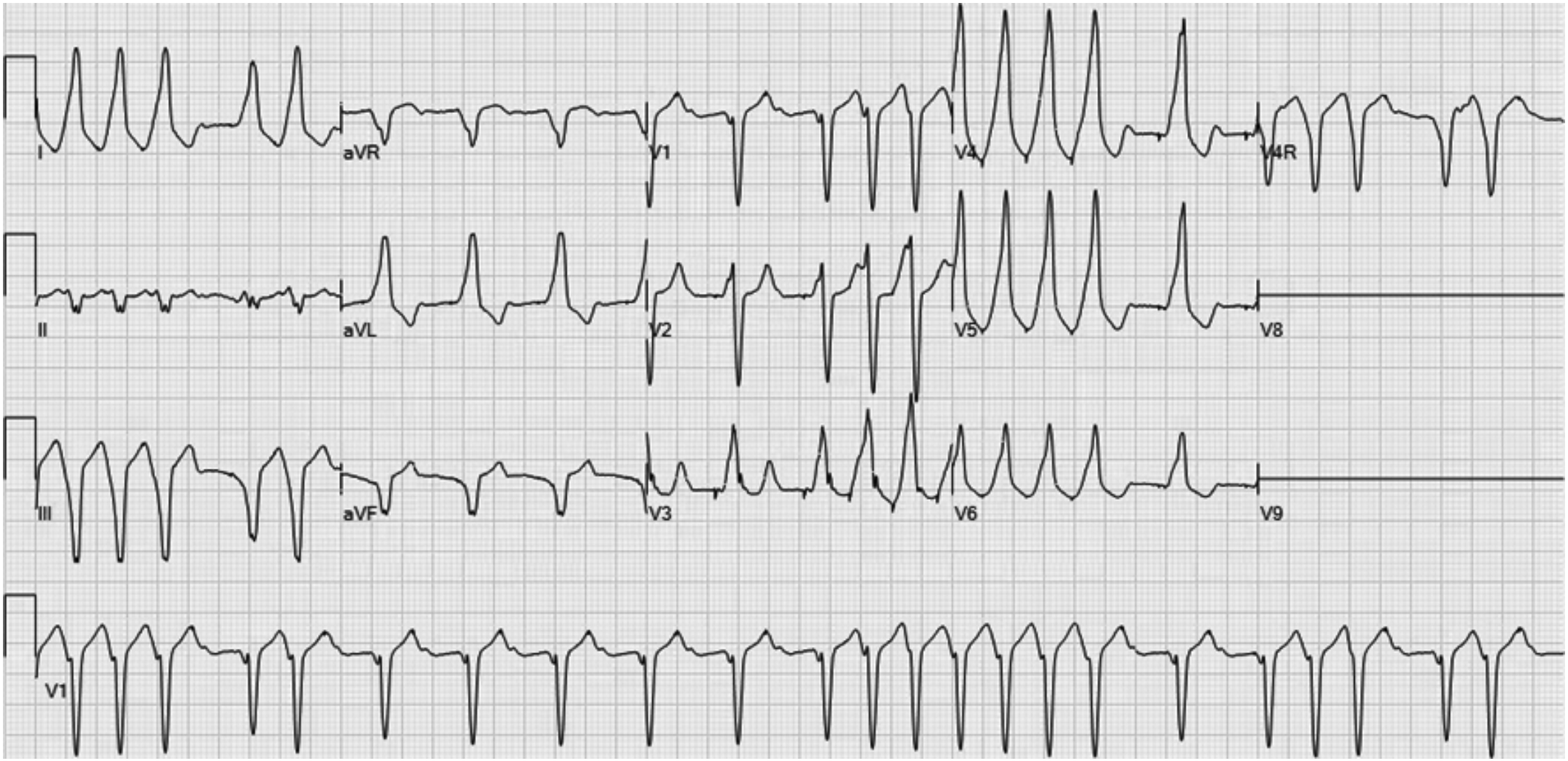
Ventricular, Atrial Rate:	103	103	bpm
PR, QRS:		174	ms
QT, QTc:	408	534	ms
PRT Axis:		-30	118	°

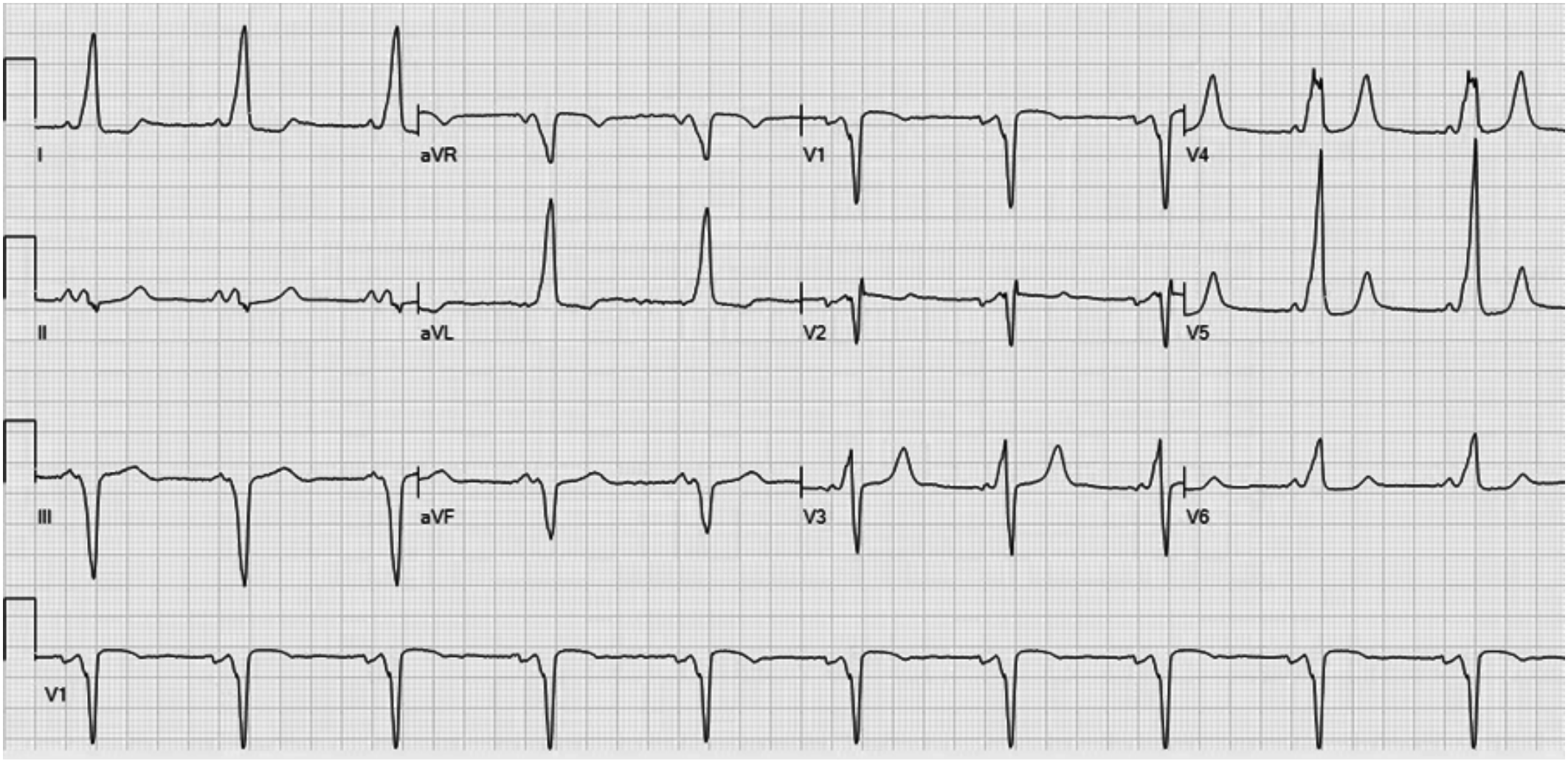
*** Poor data quality, interpretation may be adversely affected
Wide QRS rhythm
Left axis deviation
Left ventricular hypertrophy with QRS widening and repolarization abnormality
Inferior infarct , age undetermined
Abnormal ECG
No previous ECGs available




Heart rate: 185 bpm
PR interval: 108 ms
QRS time: 94 ms
QT/QTcB int.: 280 / 492 ms
QTcF int.: 408 ms
P-R-T axes: 115 / 11 / -61°
Traditional 50.0 mm/s 10 mm/mV 0.05-150 Hz
I
II
III
aVR
aVL
aVF

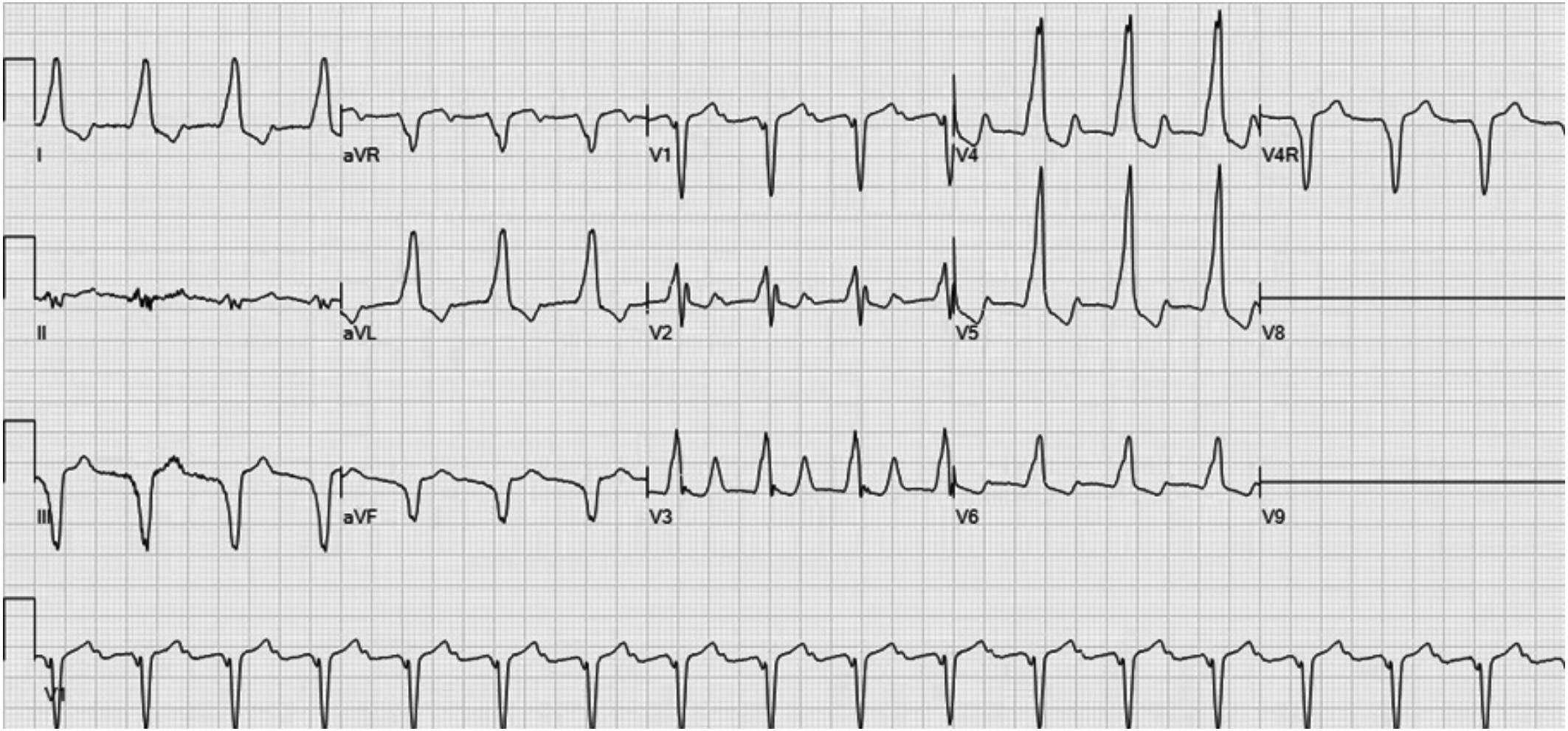

V1
V2
V3
V4
V5
V6


I
aVR
V1
V4
V4R
II
aVL
V2
V5
V8
III
aVF
V3
V6
V9
V1


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

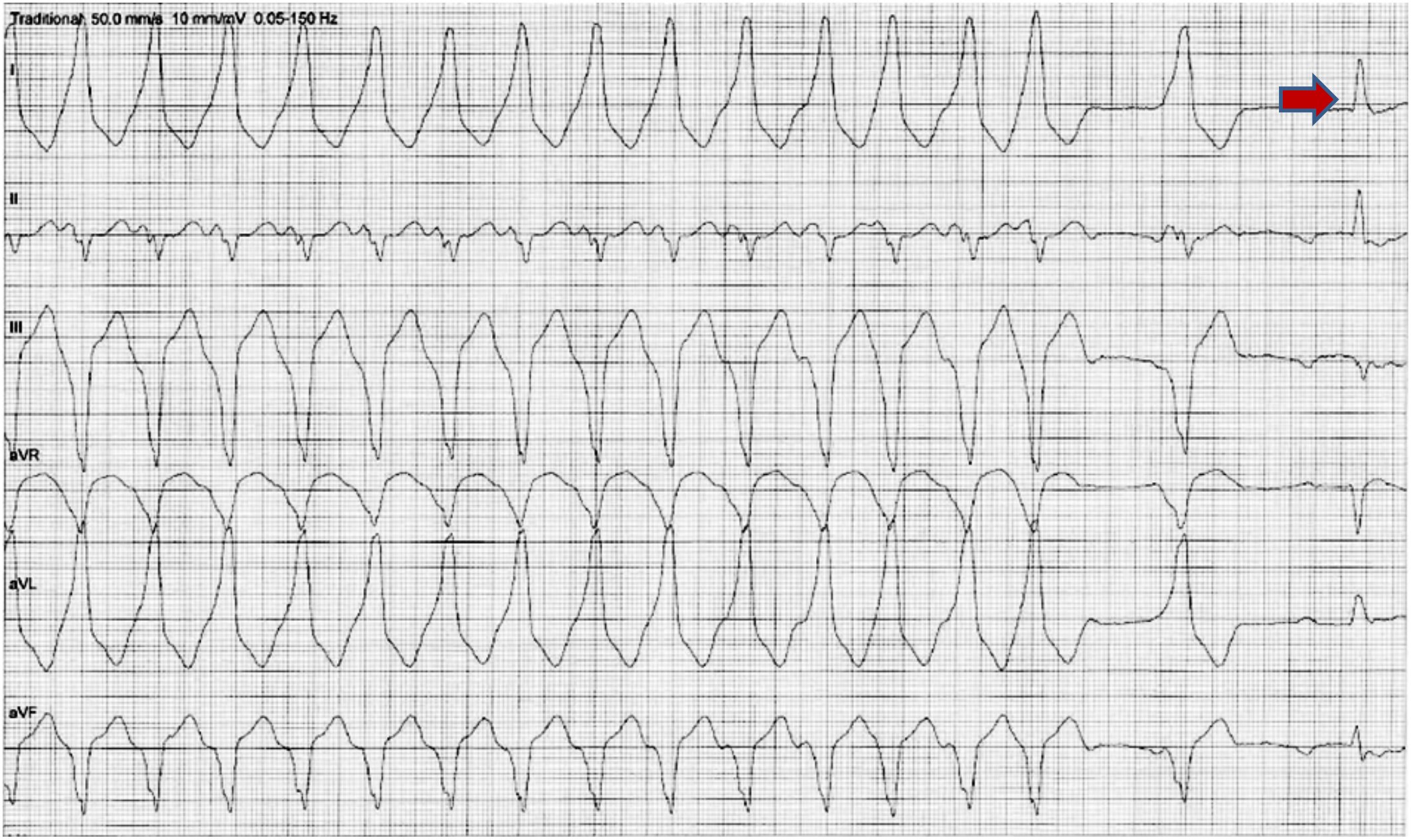
Sequential tracing analysis by professor Bernard Belhassen

Cardiologist, Head of Electrophysiology Laboratory at The Tel Aviv Sourasky Medical Center. Tel-Aviv, Israel.
Doctor Belhassen is a full professor of cardiology at Sackler School of Medicine. He has a professional interest in cardiac arrhythmias, sudden cardiac death, catheter ablation. Electronic address: bblhass@tasmc.health.gov.il



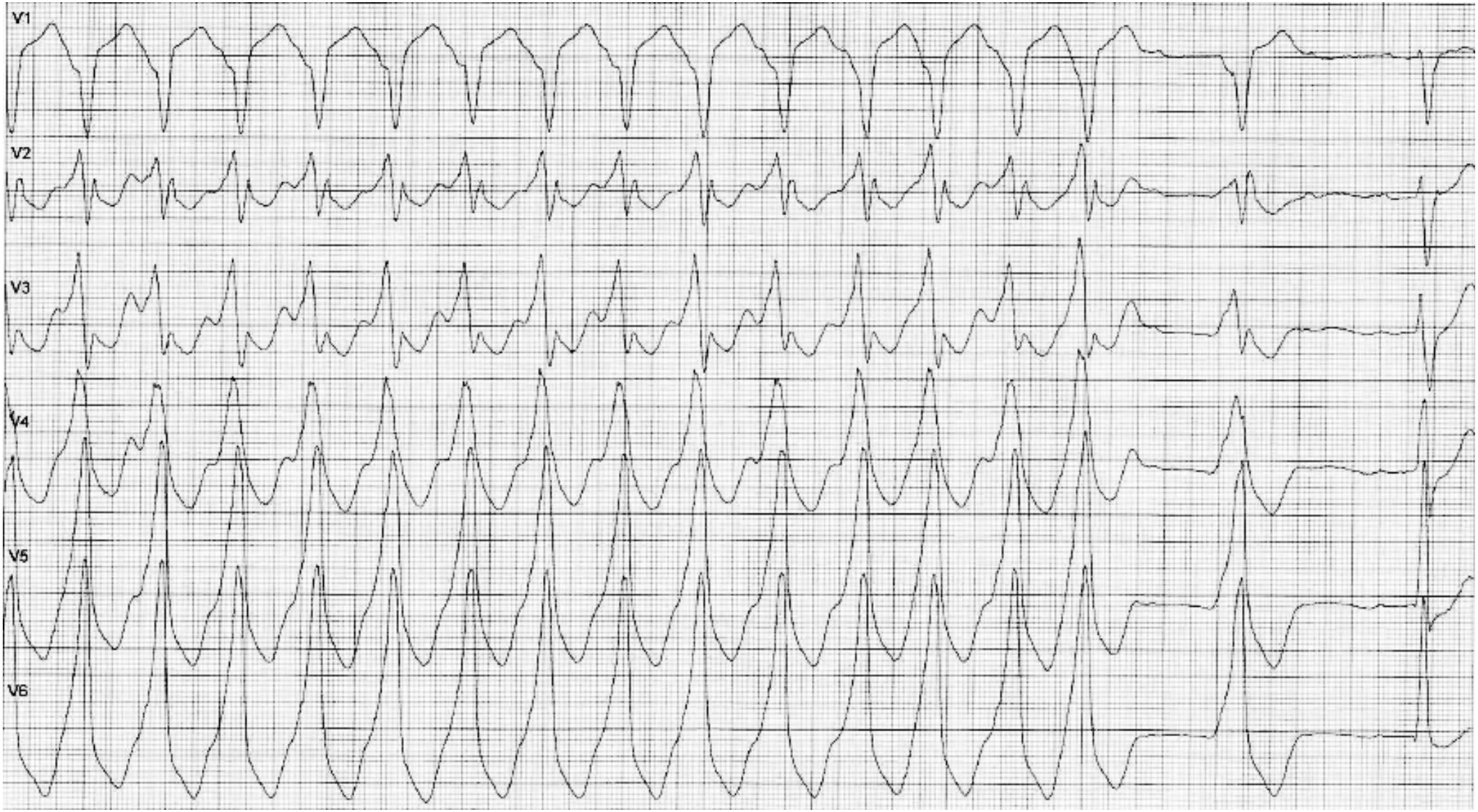
Pseudo-long PR interval associated with a typical right posteroseptal accessory pathway (AP) of course represented an atrial tachycardia/flutter 185/min with 2:1 conduction over the AP. However, should we conclude that it is impossible to have a similar tracing associated with normal sinus rhythm (NSR?) the response is: No !!! There is a theoretical possibility that NSR will be associated with both a long PR and a typical WPW in 2 instances: a) conduction with an atriofascicular AP ("Mahaim type") that is unlikely the case when dealing with an apparently typical right posteroseptal pathway; b) when the right posteroseptal pathway has a very long conduction time (this is a very exceptional feature of atrio-ventricular AP that might be seen for example after ablation of these APs).

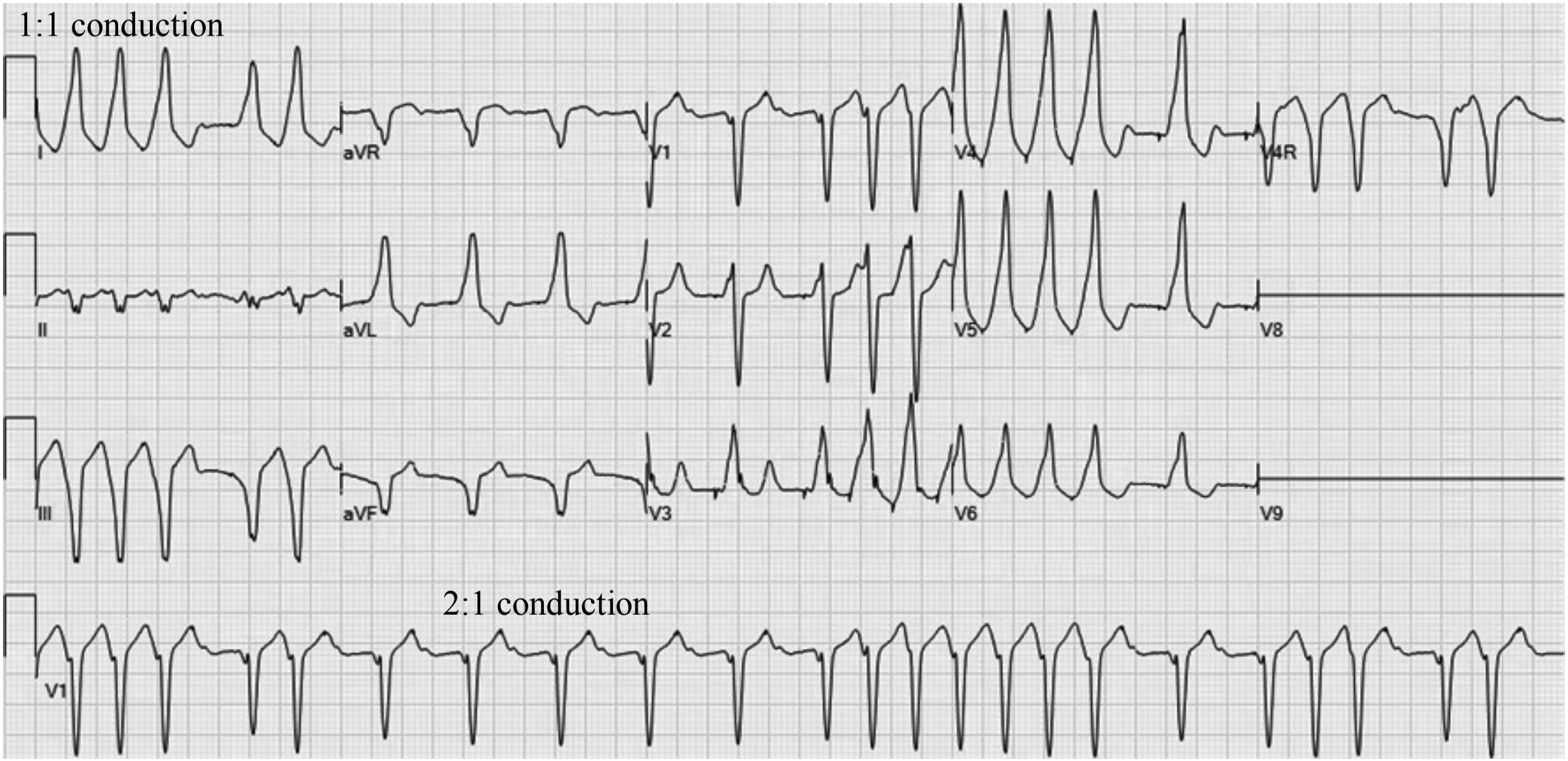
50 mm/sec!



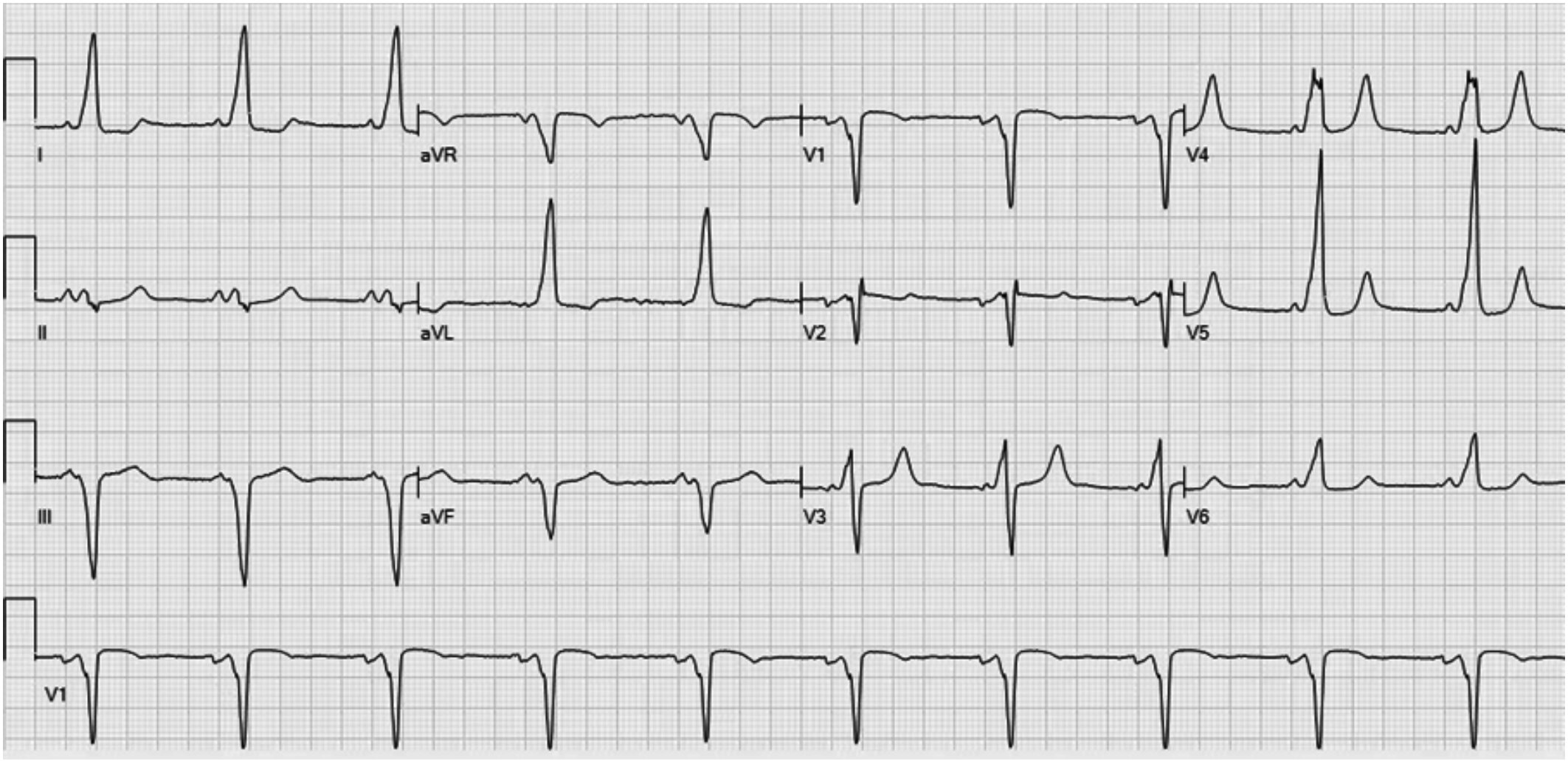
This trace is also very interesting since we actually see that the last QRS complex on the slides is "narrow" i.e. without preexcitation(arrow). This last tracing can be explained by either a) a "fatigue" of conduction in the AP; b) a bradycardic dependent or phase 4 block in that AP.

50 mm/sec!



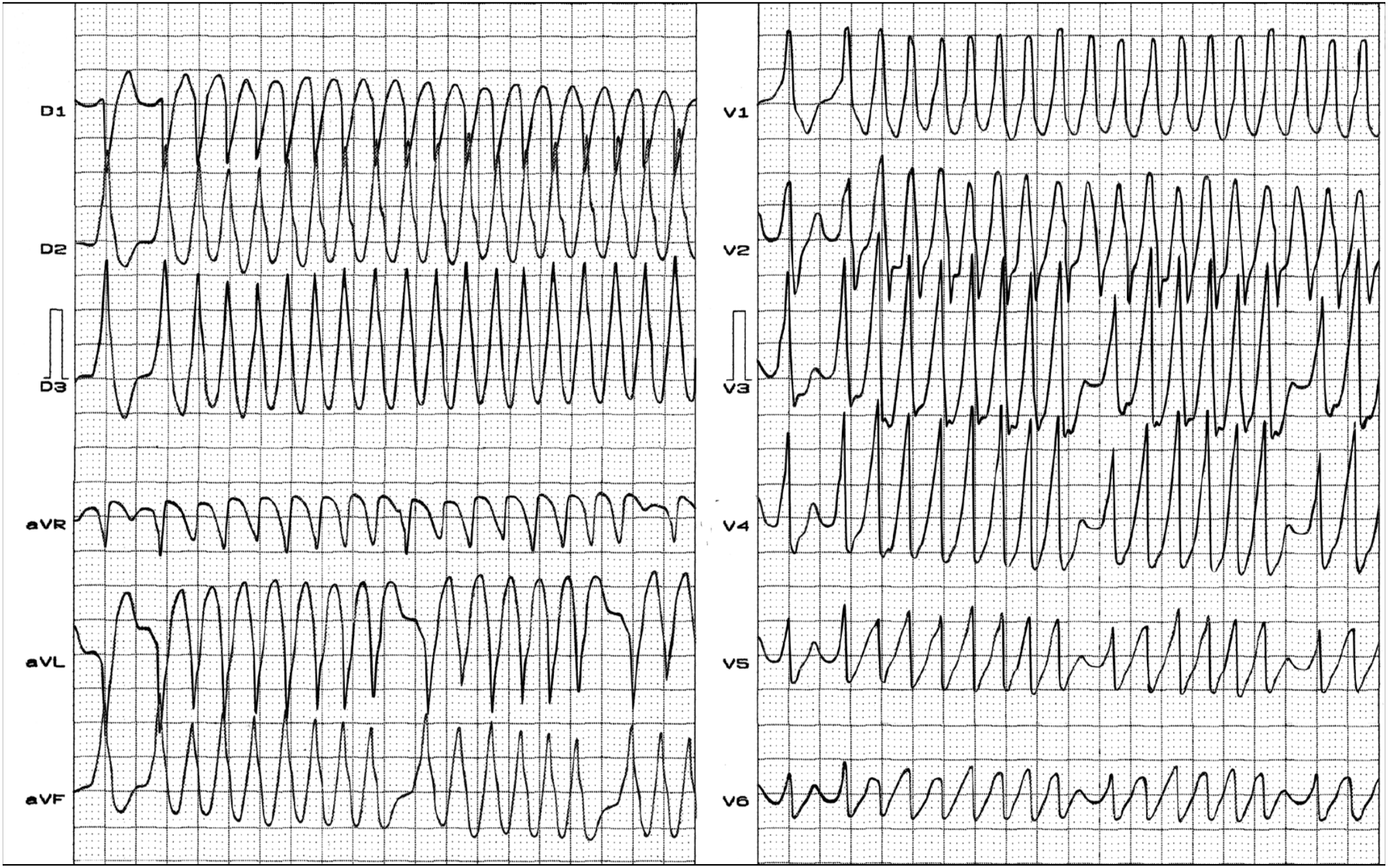


This tracing is also interesting: we should explain why atrial pacing resumed 1:1 conduction over the AP after a period of 2:1 block; my feeling is that pacing reached the AP during its supernormal phase of conduction. The irregularity of QRS complexes could erroneously suggest pre-excited atrial fibrillation. See next slide a truly pre-excited AF.



WPW with right-side inferior paraseptal AP. See explanation of AP location in the following slides.

Pre-excited atrial fibrillation



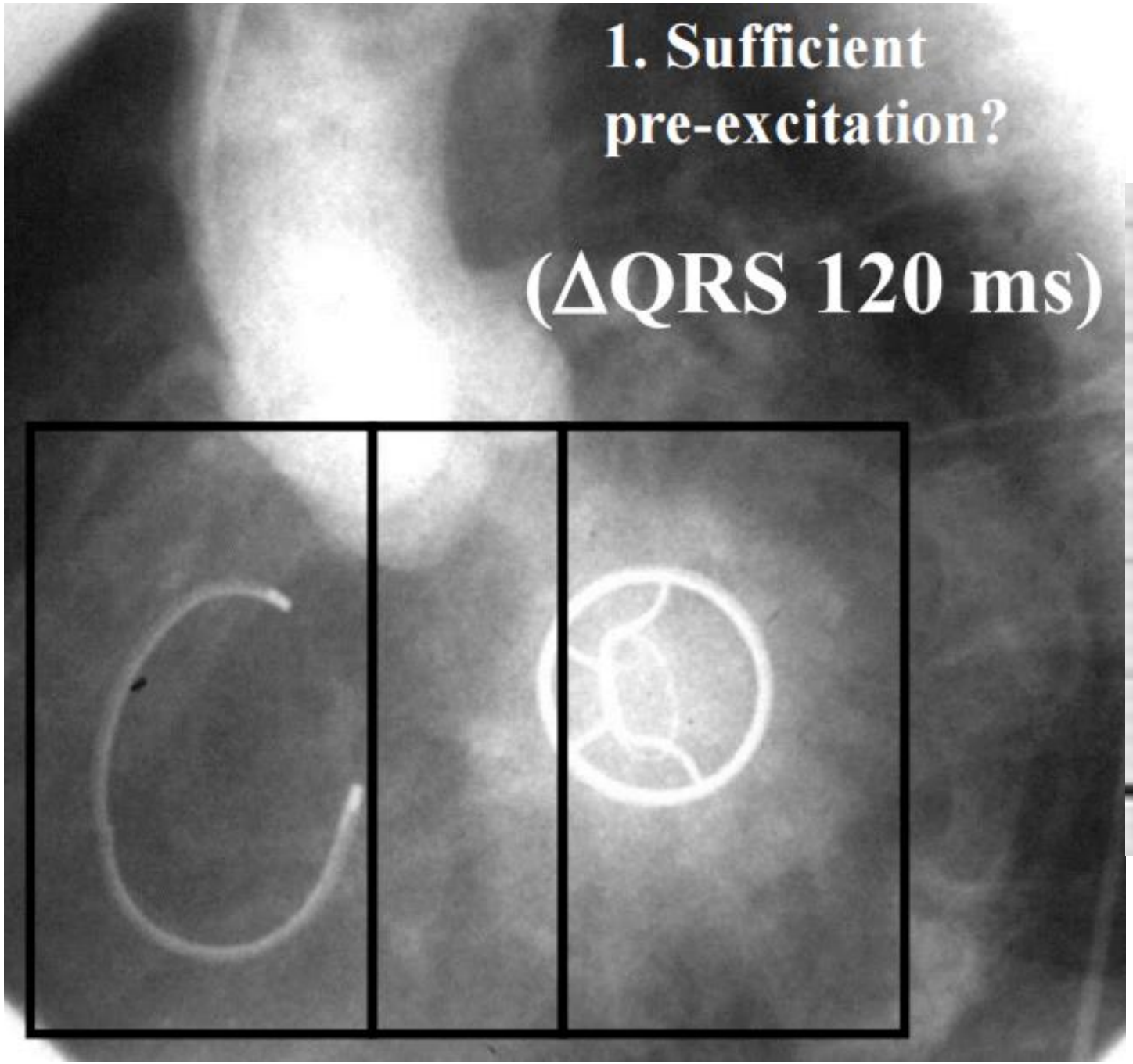
Atrial fibrillation in the presence of anomalous pathway in parallel to short refractory period: irregular RR intervals, wider QRS complexes in a variable degree and very high HR (close to 300 bpm).

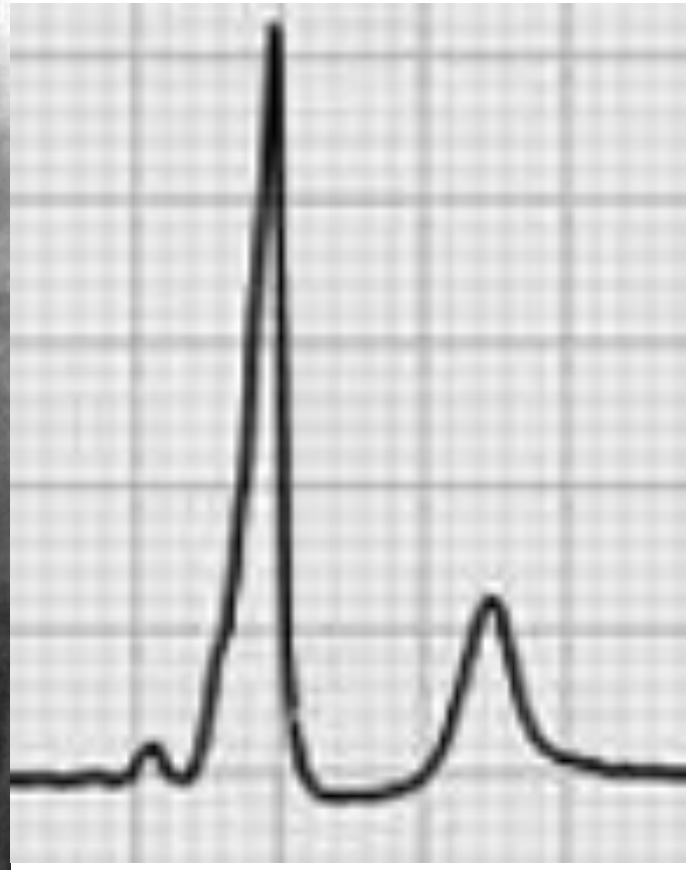
Current Nomenclature and Proposed Terminology

Current (Attitudinally Incorrect)	Proposed (Attitudinally Correct)
Right	
anterior	superior
antero-lateral	supero-anterior
lateral	anterior
postero-lateral	infero-anterior
posterior	inferior
Left	
anterior	superior
antero-lateral	supero-posterior
lateral	posterior
postero-lateral	infero-posterior
posterior	inferior
Septal paraseptal	
anteroseptal	superoparaseptal
posteroseptal	inferoparaseptal
midseptal	septal

Proposed terminology is based on anatomic positions.

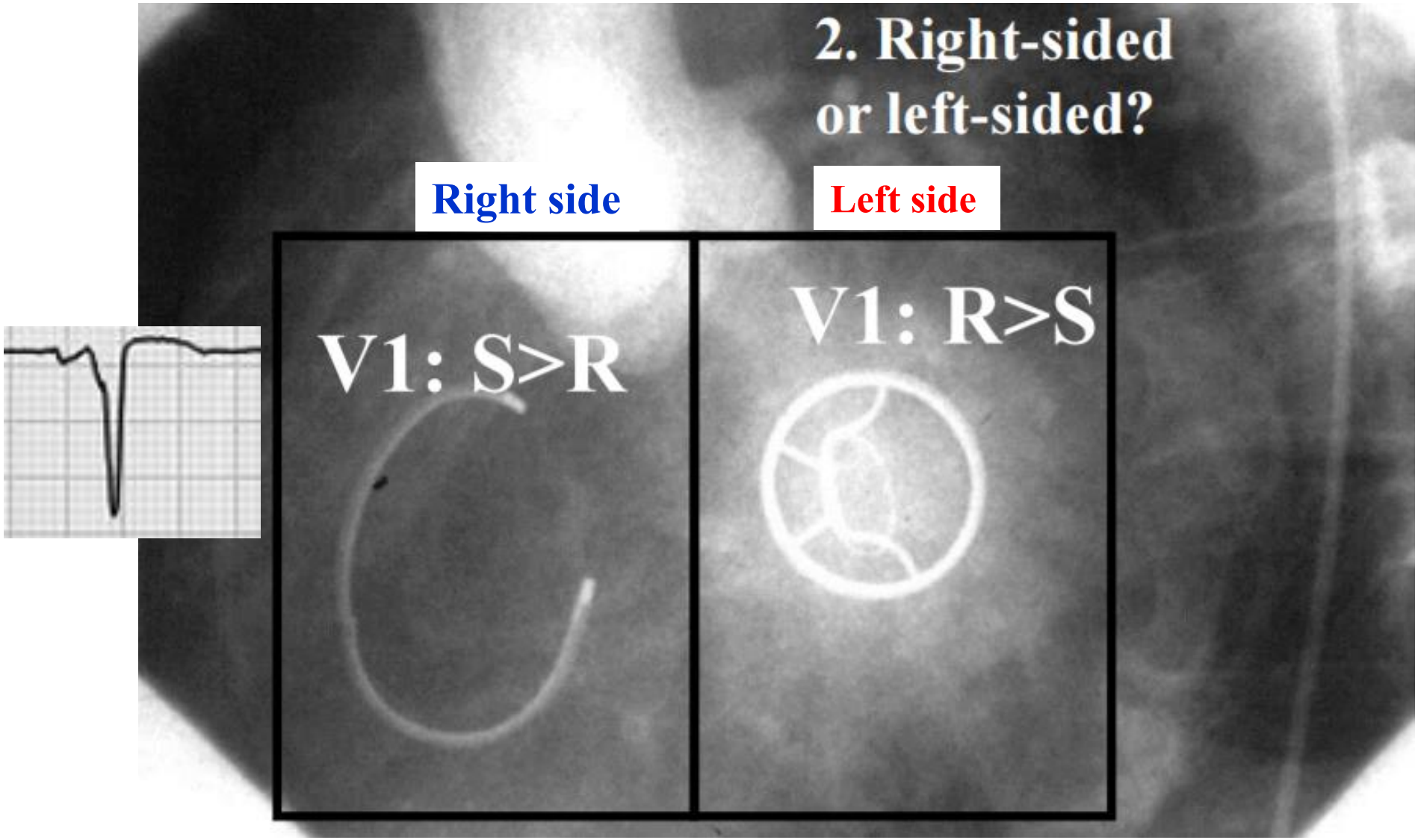
First step: QRS with Δ wave and wide?





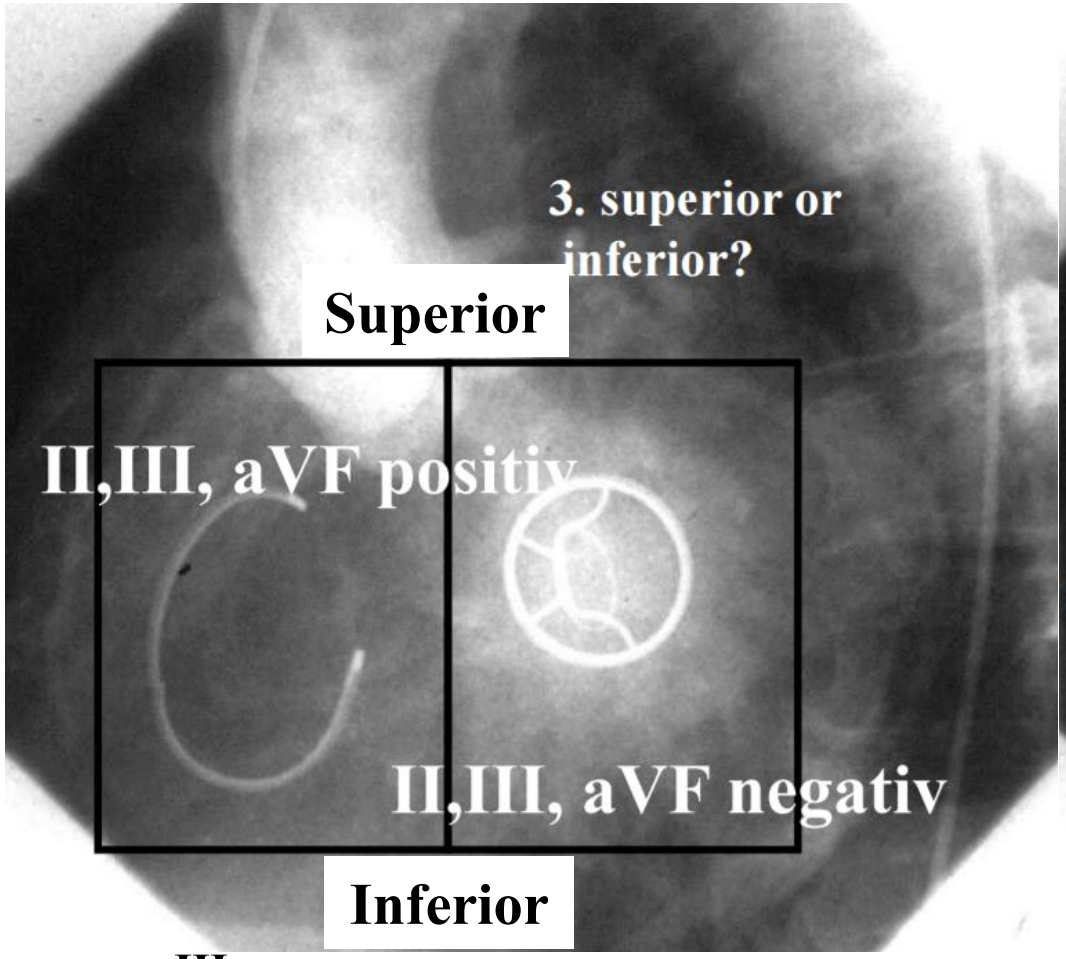
Answer: sufficient for pre-excitation criteria: short PR interval, Δ at the beginning of QRS, prolonged QRS.

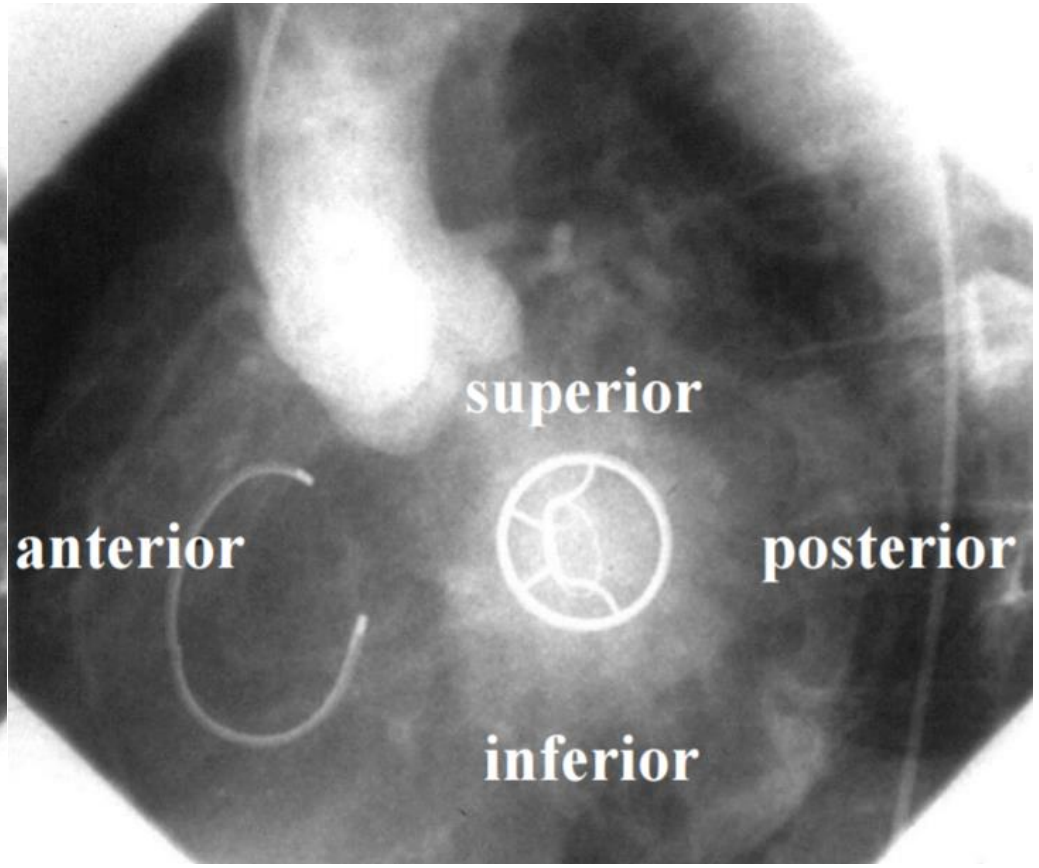
Second step: right side or left side?



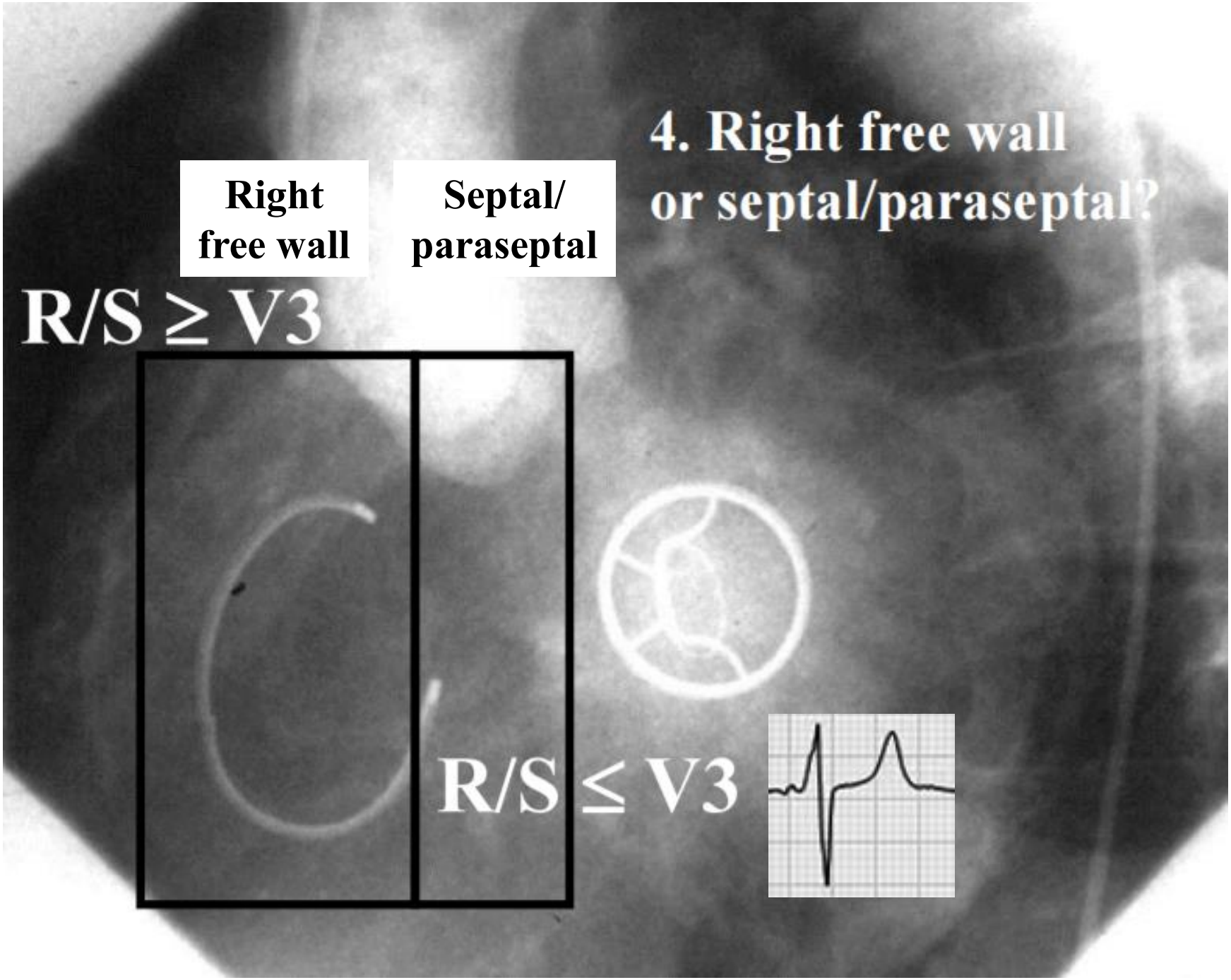
Answer: right side, because S>R in V1.

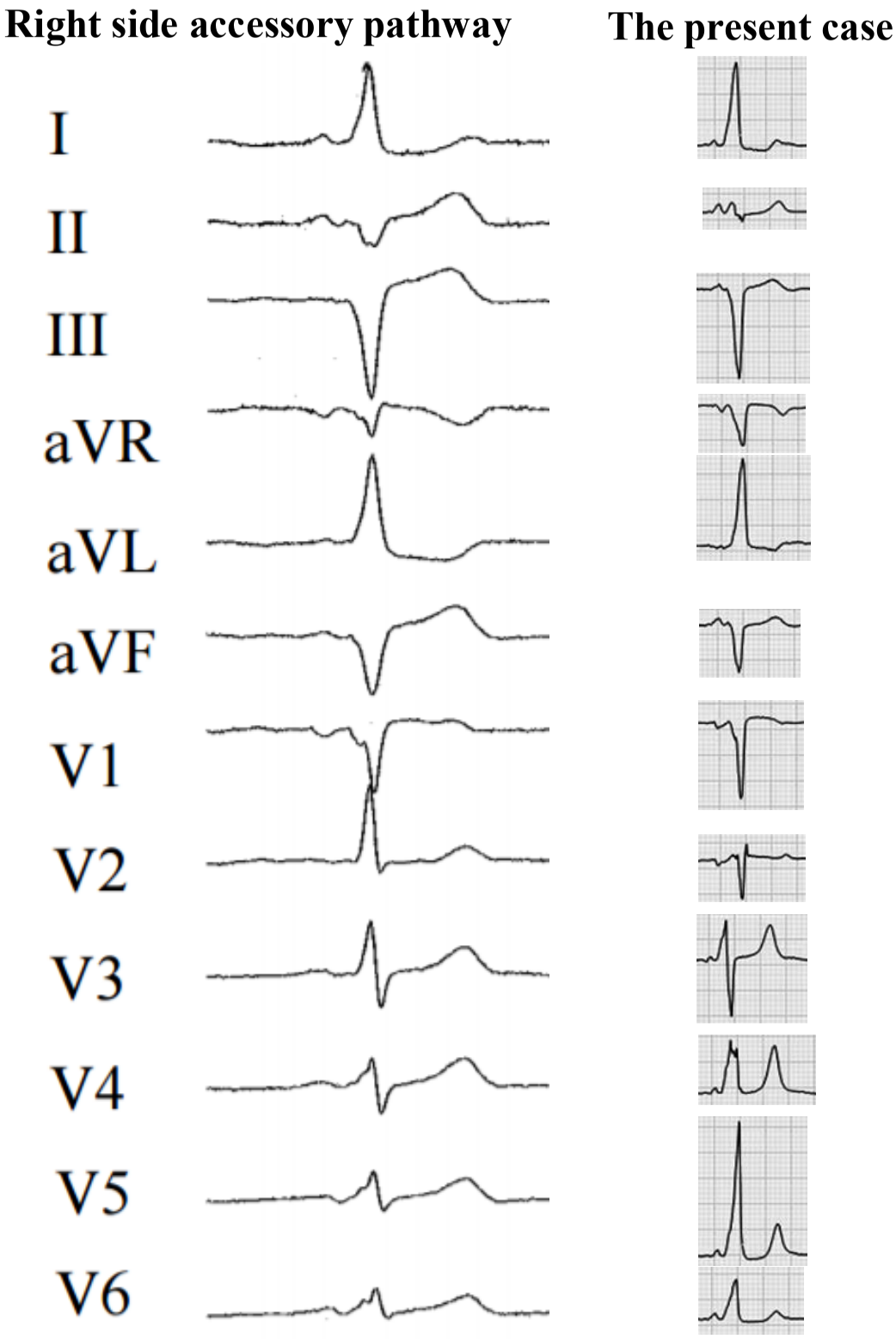
Third step: superior or inferior?



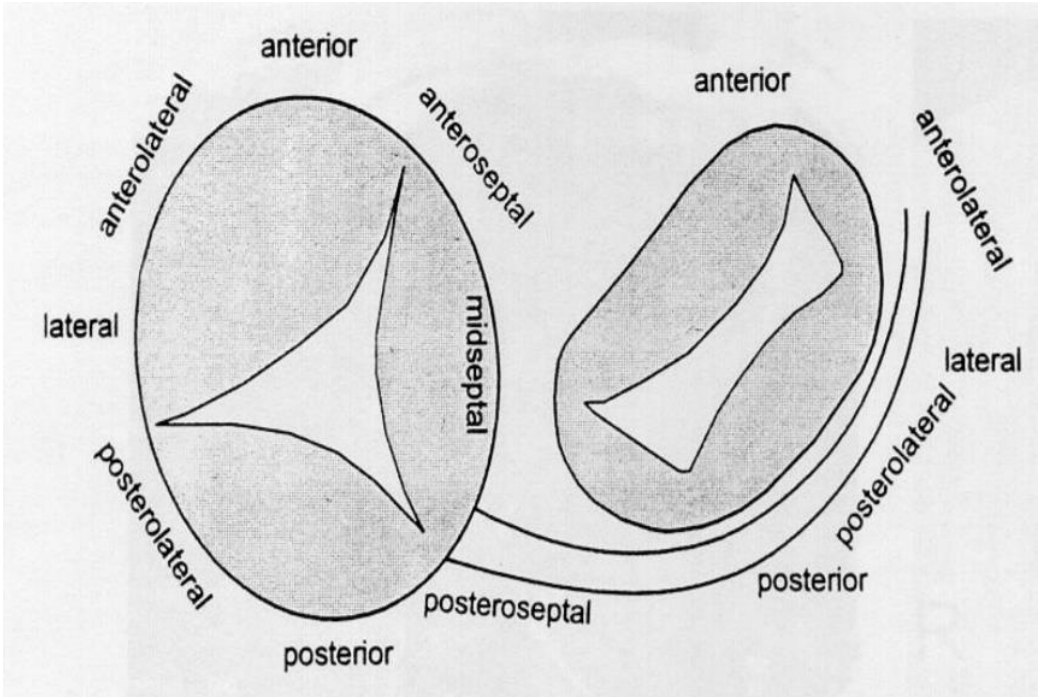


Answer: inferior, because inferior leads are predominantly negative

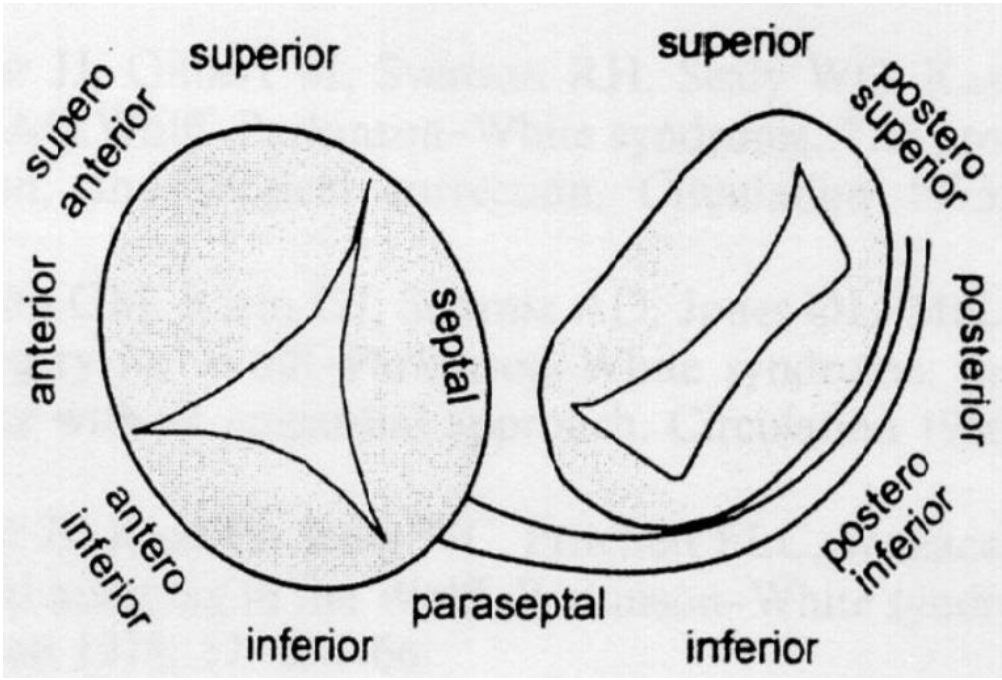

4. Right free wall
or septal/paraseptal?
Right
free wall
Septal/
paraseptal
R/S ≥ V3
R/S ≤ V3


Right side accessory pathway
The present case
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6

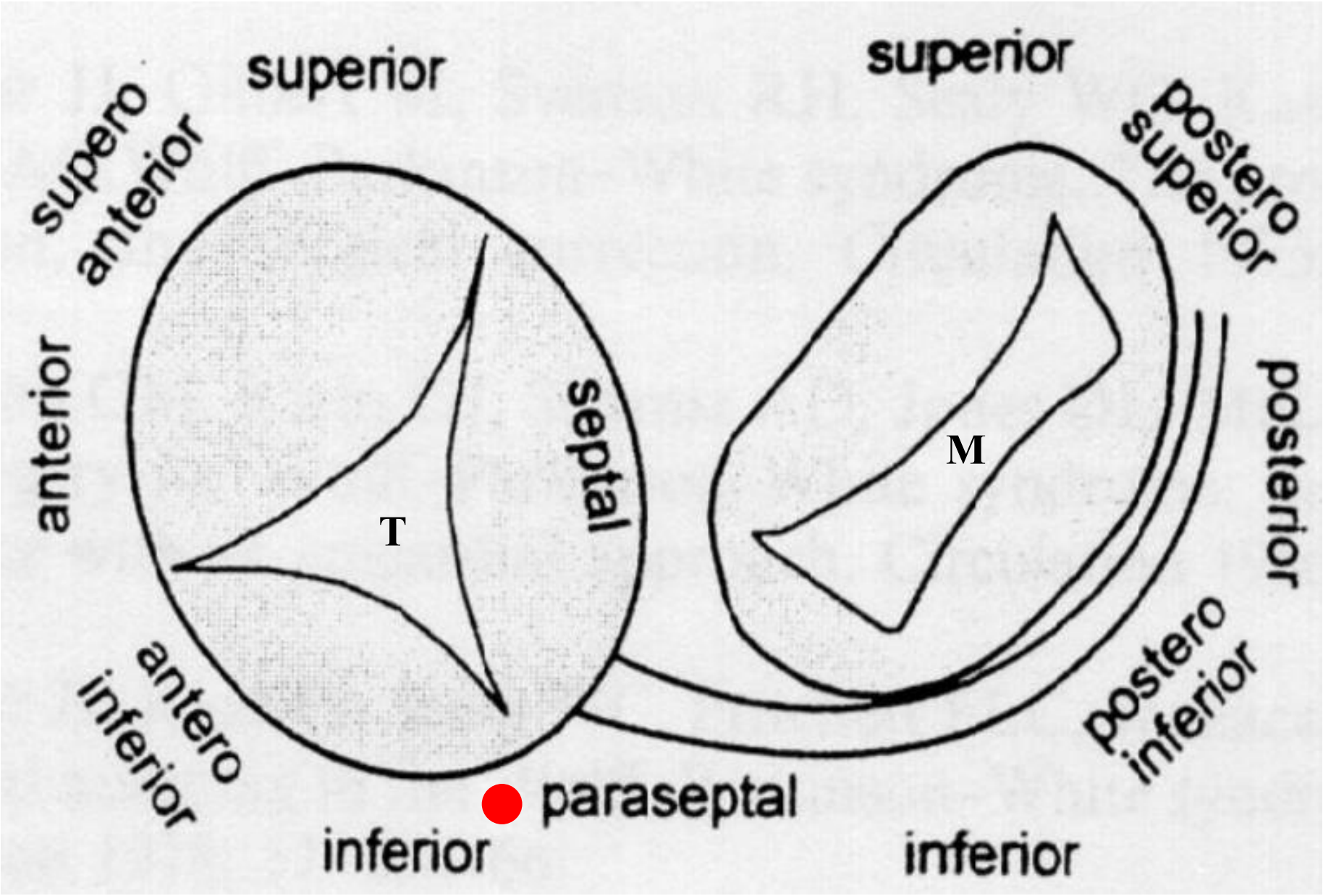
Old nomenclature for Accessory pathways location



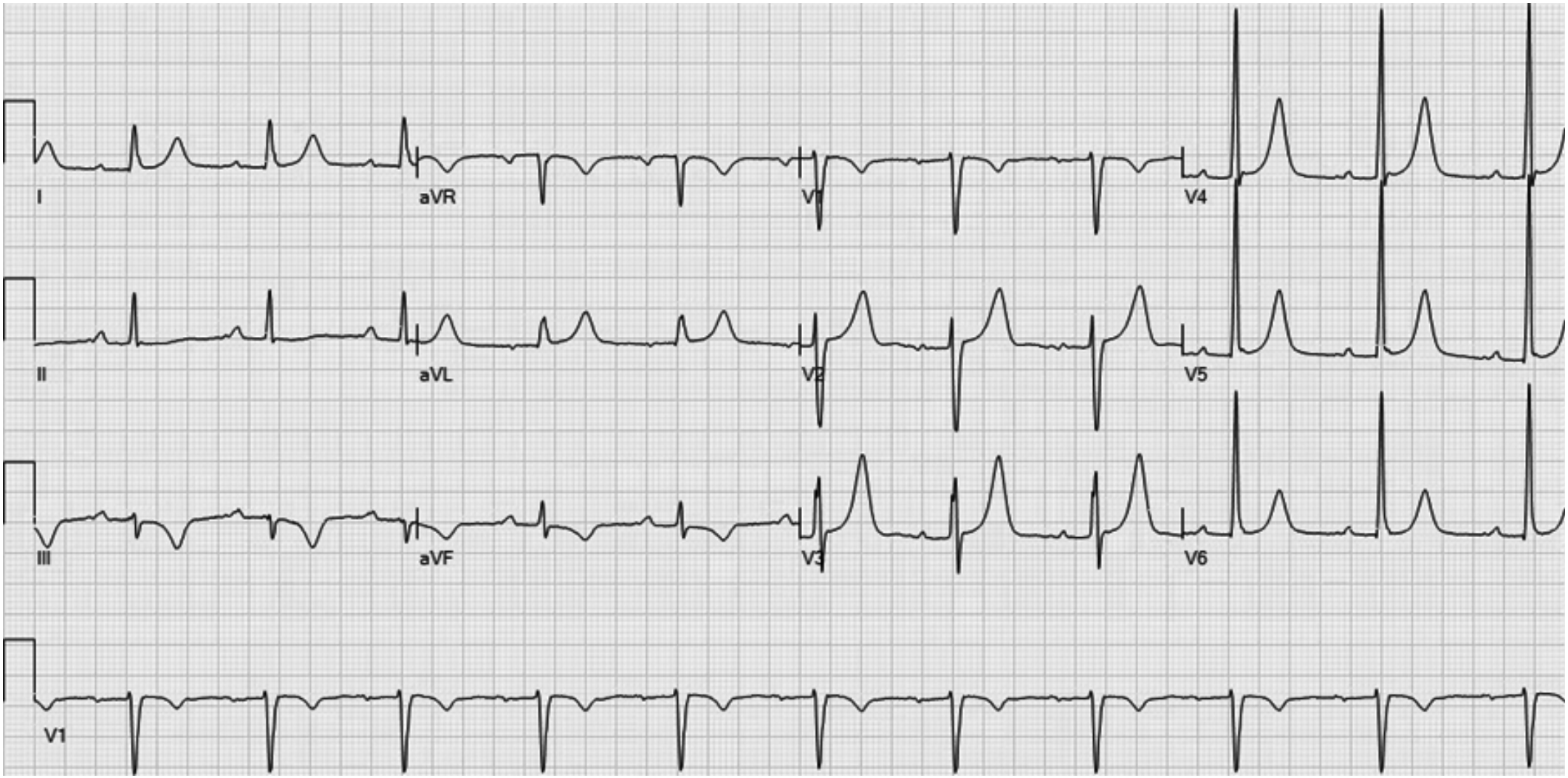
New nomenclature for Accessory pathways location



New nomenclature for Accessory pathways location



Post-ablation



Cardiac memory phenomena after ablation in III and aVF

Intracardiac electrophysiology study (EPS)

- VA block
- Antegrade conduction only via accessory pathway
- AP-ANTE-ERP (effective refractory period) 600-320, IAP 320 via accessory pathway
- Isoprenaline infusion:
  - Conduction also via AV node
  - Acceleration of conduction via AP: antegrade IAP <230, AP-ANTE-ERP 500-200
- Isthmus ablation successful
- AP location: right, region of slow pathways of the AV node (in LAO 40 projection: 4-5 o'clock; "posteroseptal")
- Ablation of accessory pathway successful

Comments: the authors successfully ablated the AP; they also ablated the cavo-tricuspid isthmus; I think that the latter will not prevent recurrence of the atrial arrhythmia that I highly suspect not to be right isthmus dependent but merely a left atrial flutter related to mitral valve disease/prothesis.

In conclusion, do not hesitate to continue sending such tracings and congratulate Dr Olli Arola and coworkers from Finland to share this superb case with us at a time where ....the new generation of cardiac electrophysiologists are so busy in burning the left atrium and have so few opportunity to see and treat WPW patients due to the disease extinction.