

Curso Nacional  
de Reciclagem em  
Cardiologia da  
Região Sul



# Bloqueios de Ramo

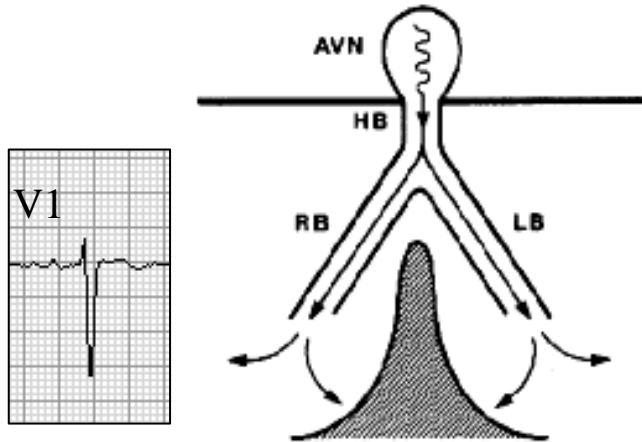
Andrei Lewandowski

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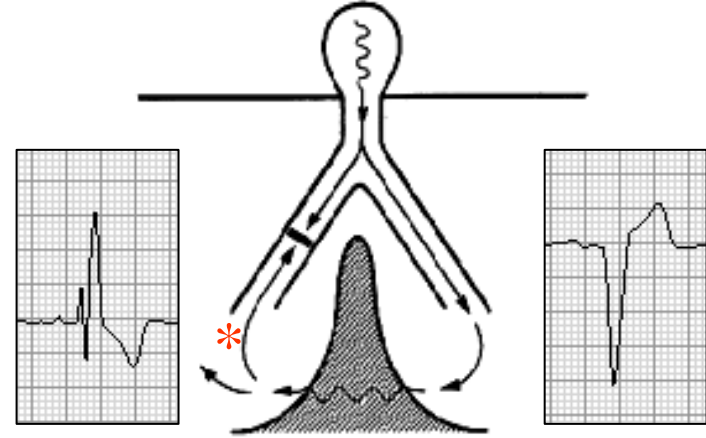


Unicardio HSC Blumenau  
SOS Cardio Florianópolis  
IC - SES - São José

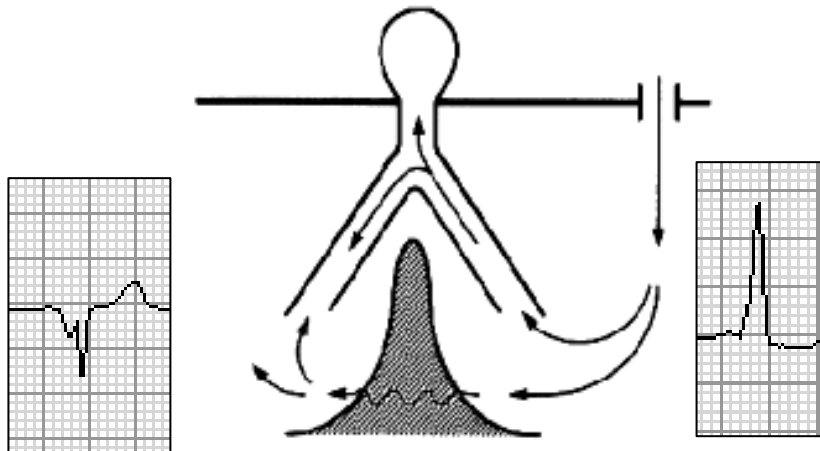
## QRS Estreito



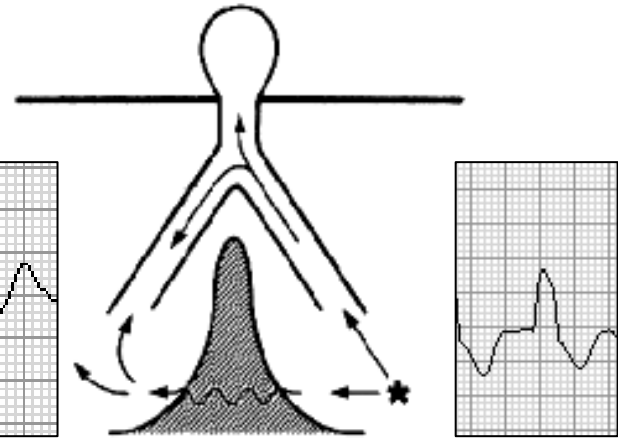
## QRS Largo - B. de Ramo (Condução Aberrante)

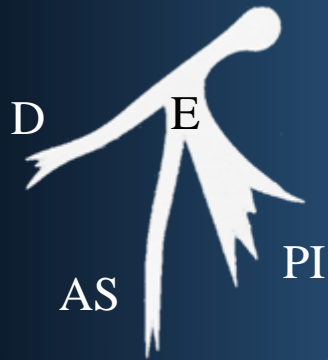


## QRS Largo - Preexcitação (Via Acessória)



## QRS Largo (TV)





# Bloqueios de Ramo

## Causas

### Idiopático

Degenerativo (Lev, Lenègre)

Secundário (HAS, M. Isquêmica,  
Valvopatia, Chagas)

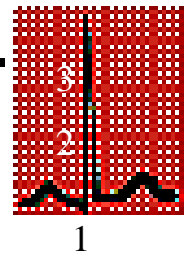
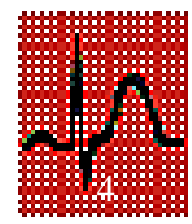
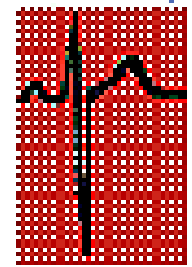
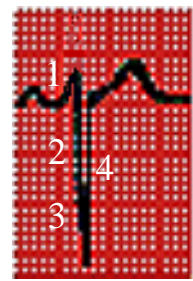
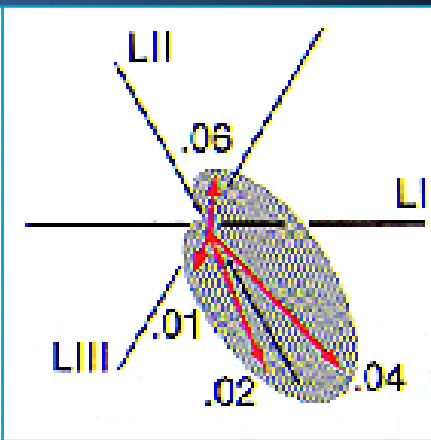
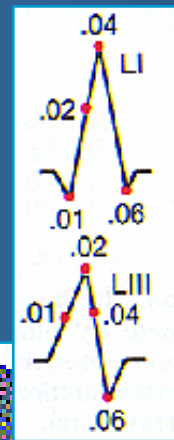
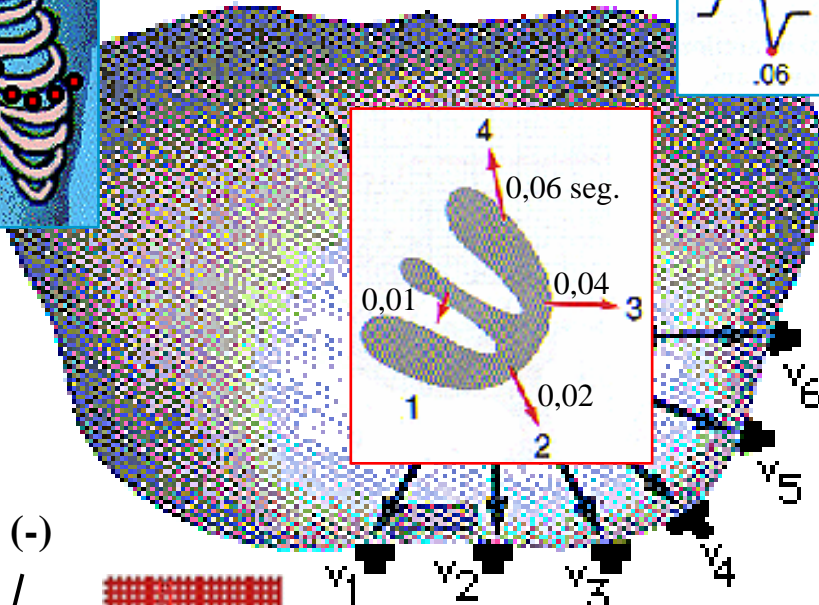
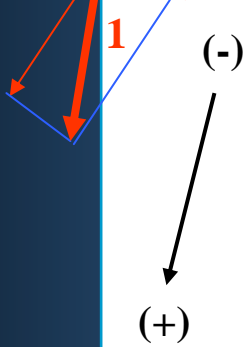
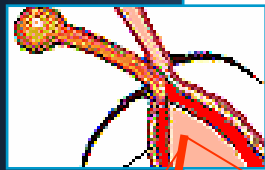
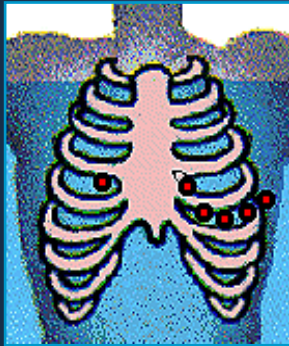
Funcionais (Aberrância de  
condução):

- Taquicardia dependentes (Fase 3)
- Bradicardia dependentes (Fase 4)
- Penetração oculta retrógrada

### Distúrbio de condução inespecífico

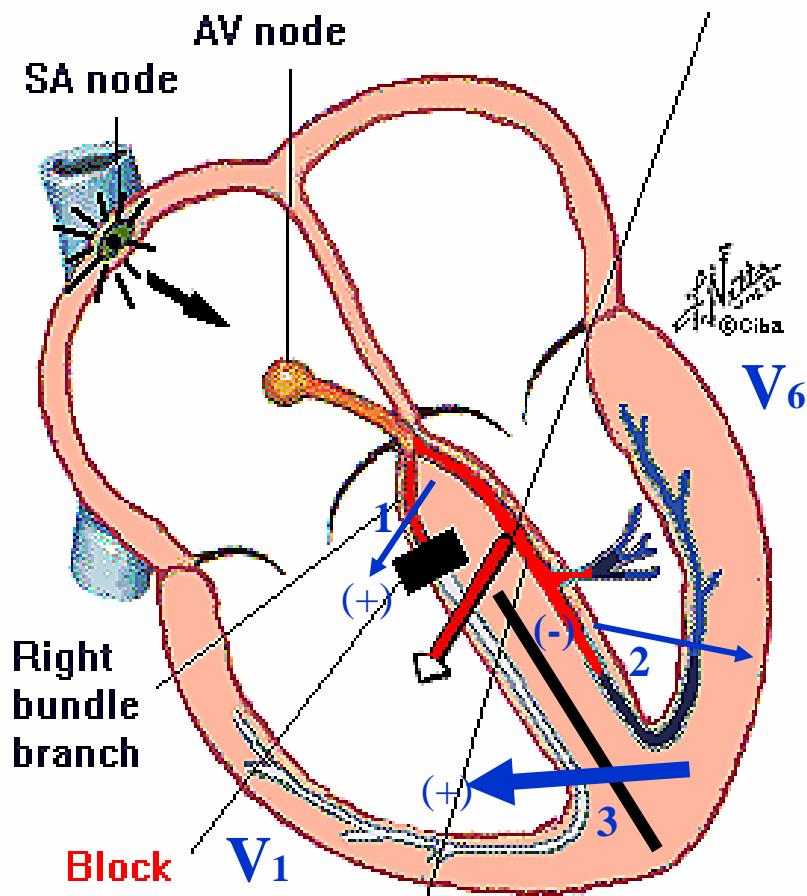
- Miocardiopatia difusa
- Antiarrítmicos classes I ou III
- Distúrbio eletrolítico
- Isquemia miocárdica

# Vetores do ÂQRS

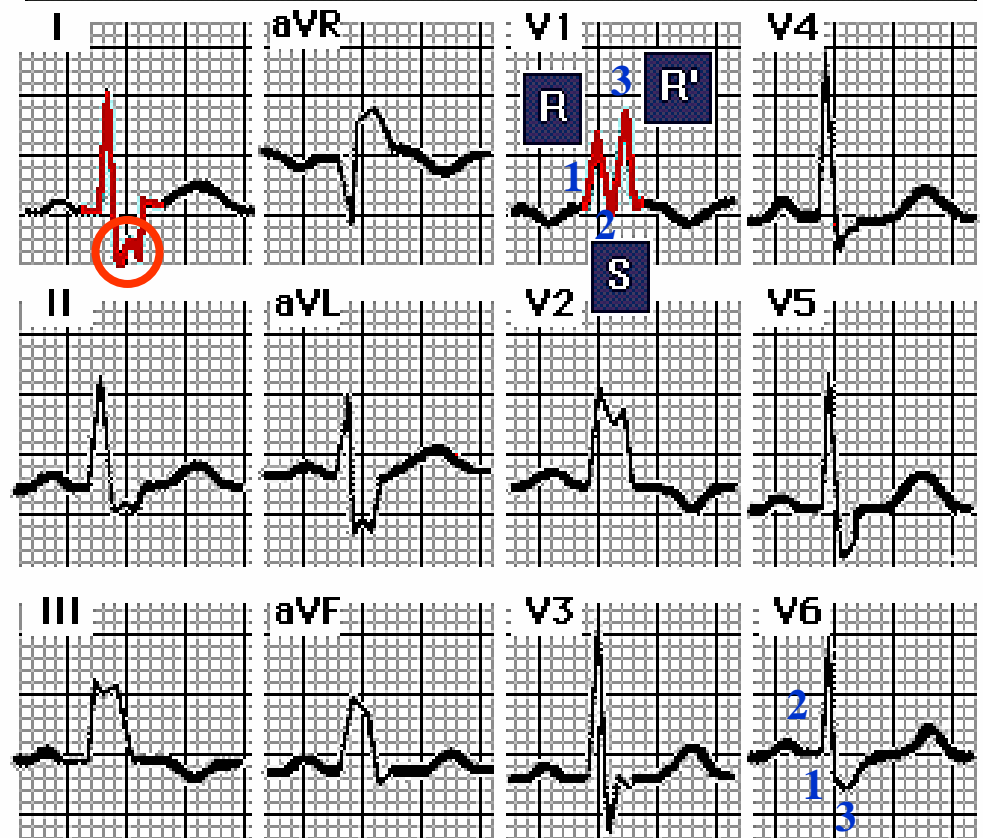


# Bloqueio do Ramo Direito

Late abnormal electrical vector bypasses block

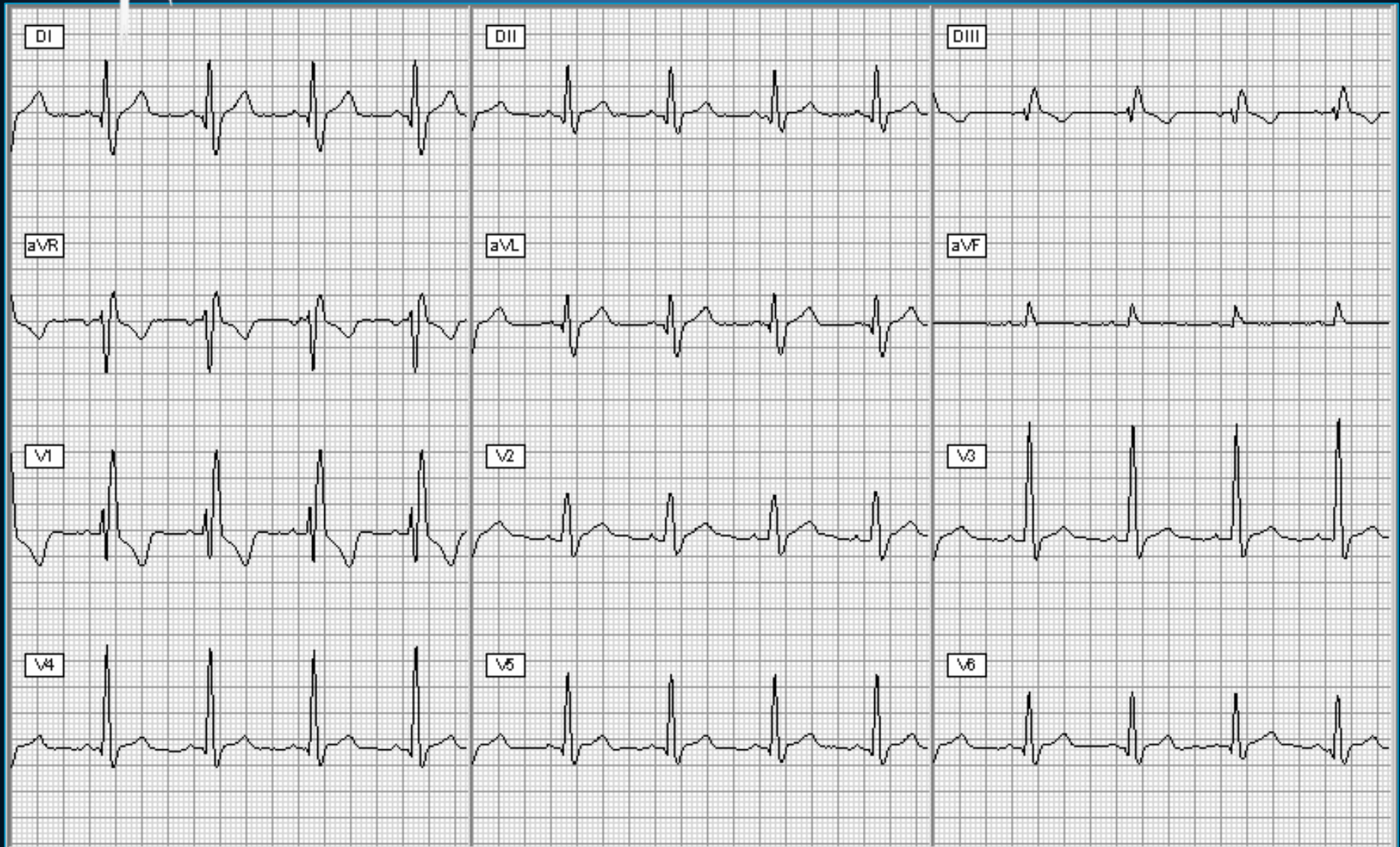


Total QRS prolonged ( $\geq 0.12$  second)  
Terminal broad S wave in lead I  
RSR' complex in lead V1

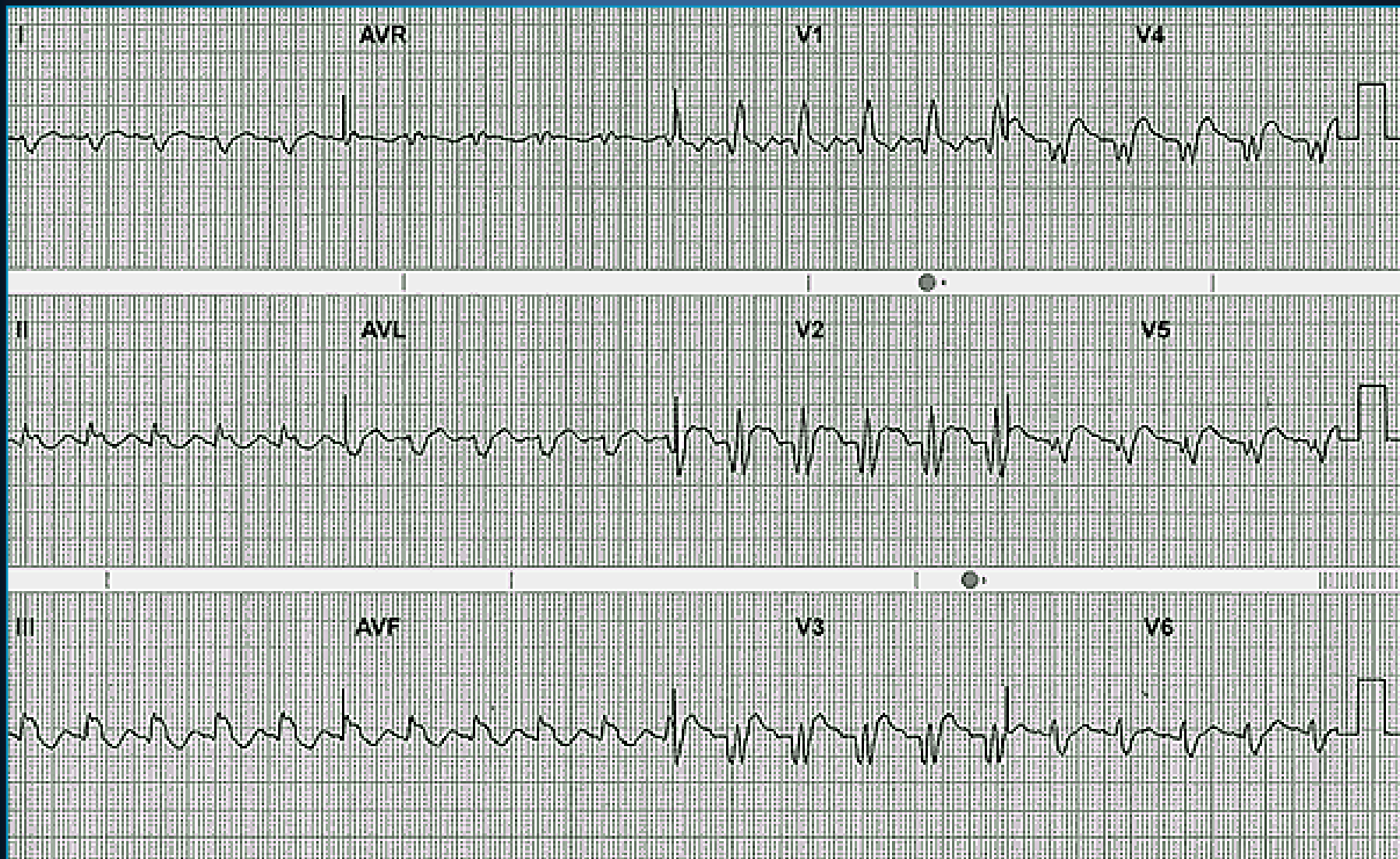




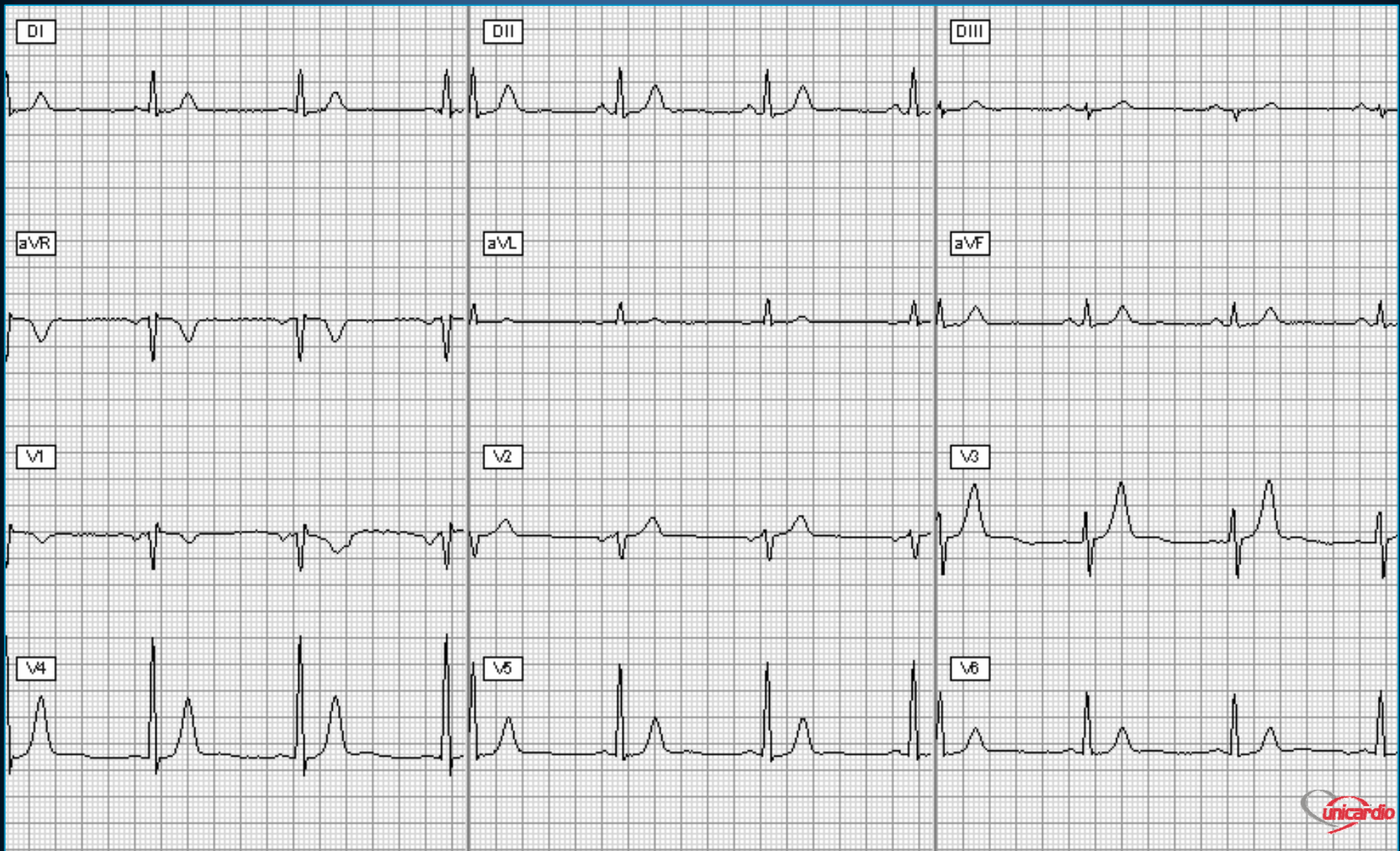
# Bloqueio do Ramo Direito



# BRD e IAM Ântero-septal



# BRD “Incompleto”



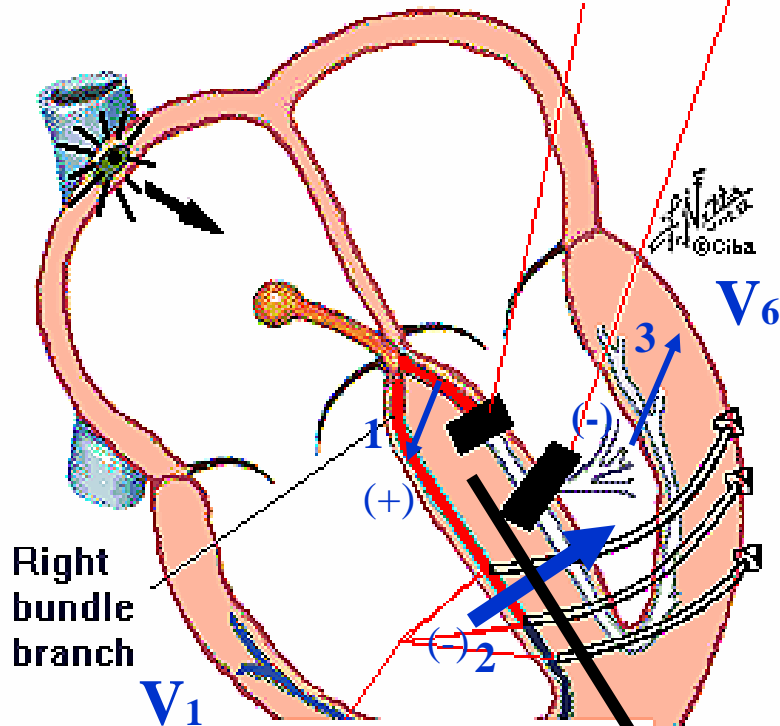


# Bloqueio do Ramo Esquerdo

Block of left anterior or posterior fascicles

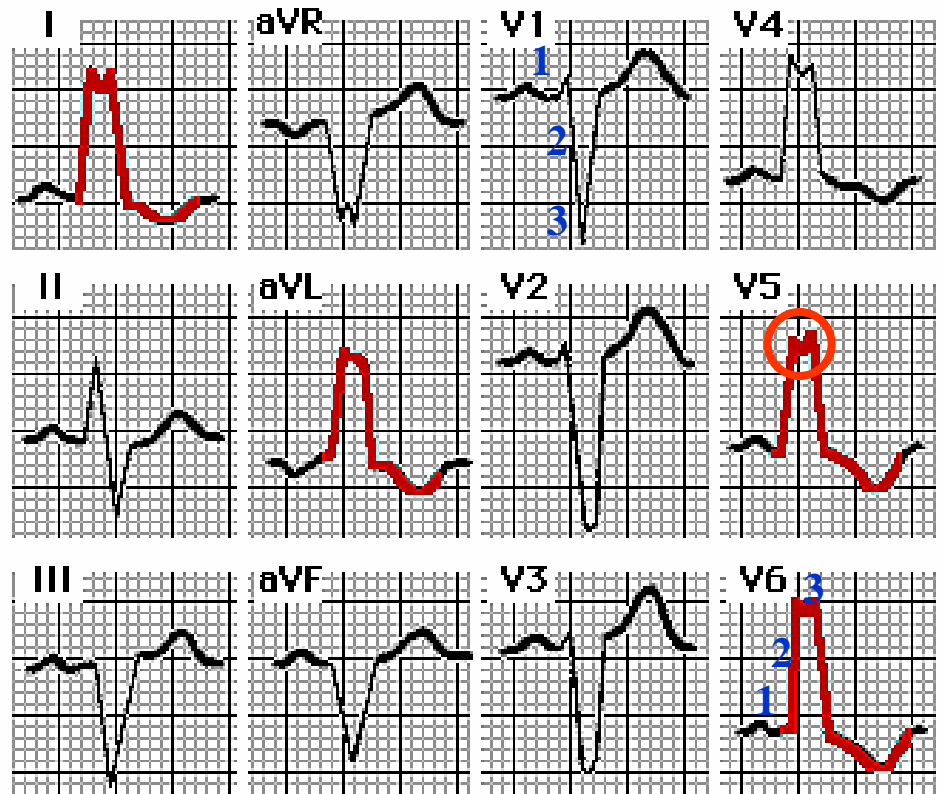
OR

Block of left main bundle branch



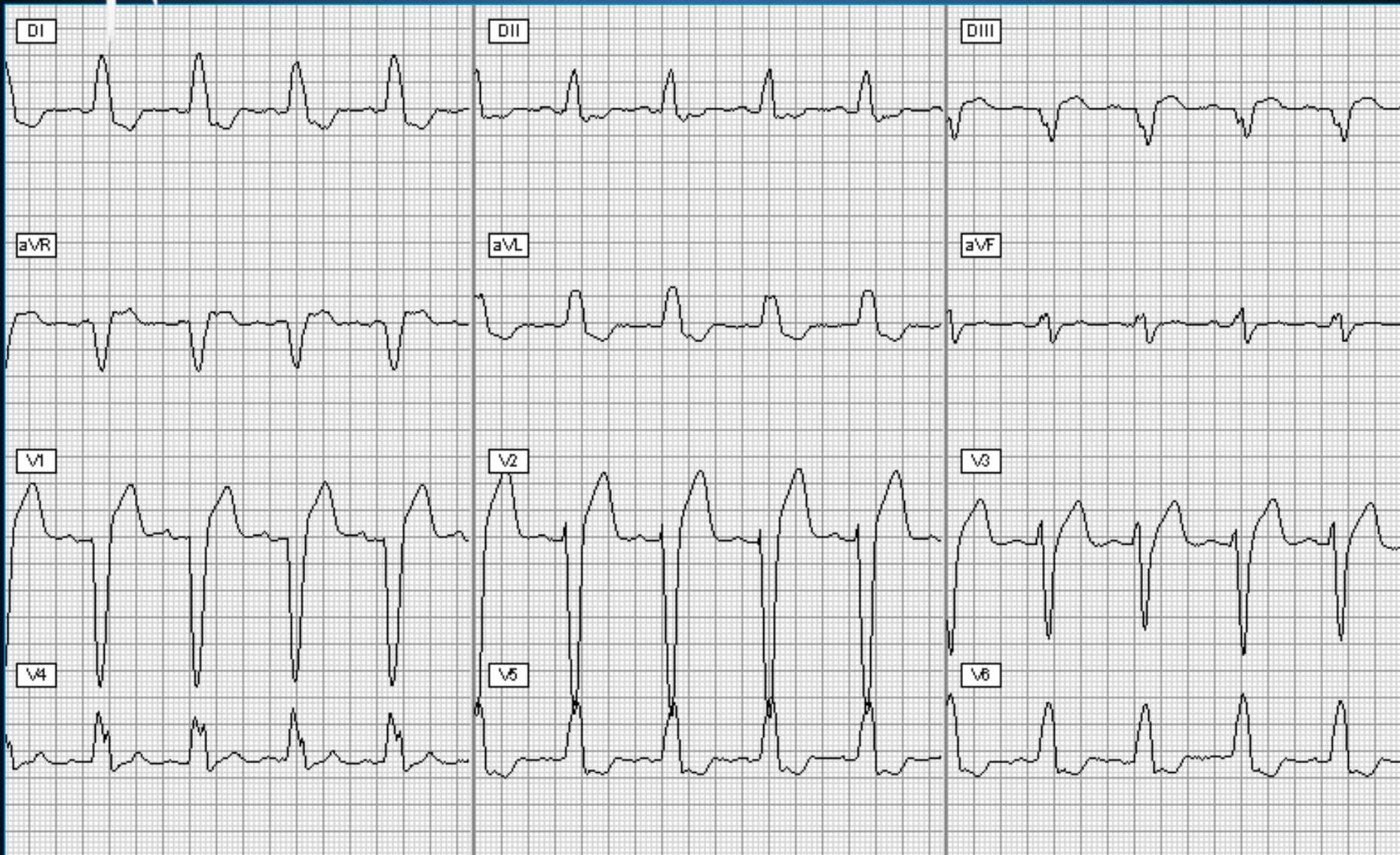
Electrical vector directed toward left ventricle as in normal, but delayed and prolonged

Wide QRS complex ( $\geq 0.12$  second), with ST depression in leads I, aVL, V<sub>5</sub>, and V<sub>6</sub>

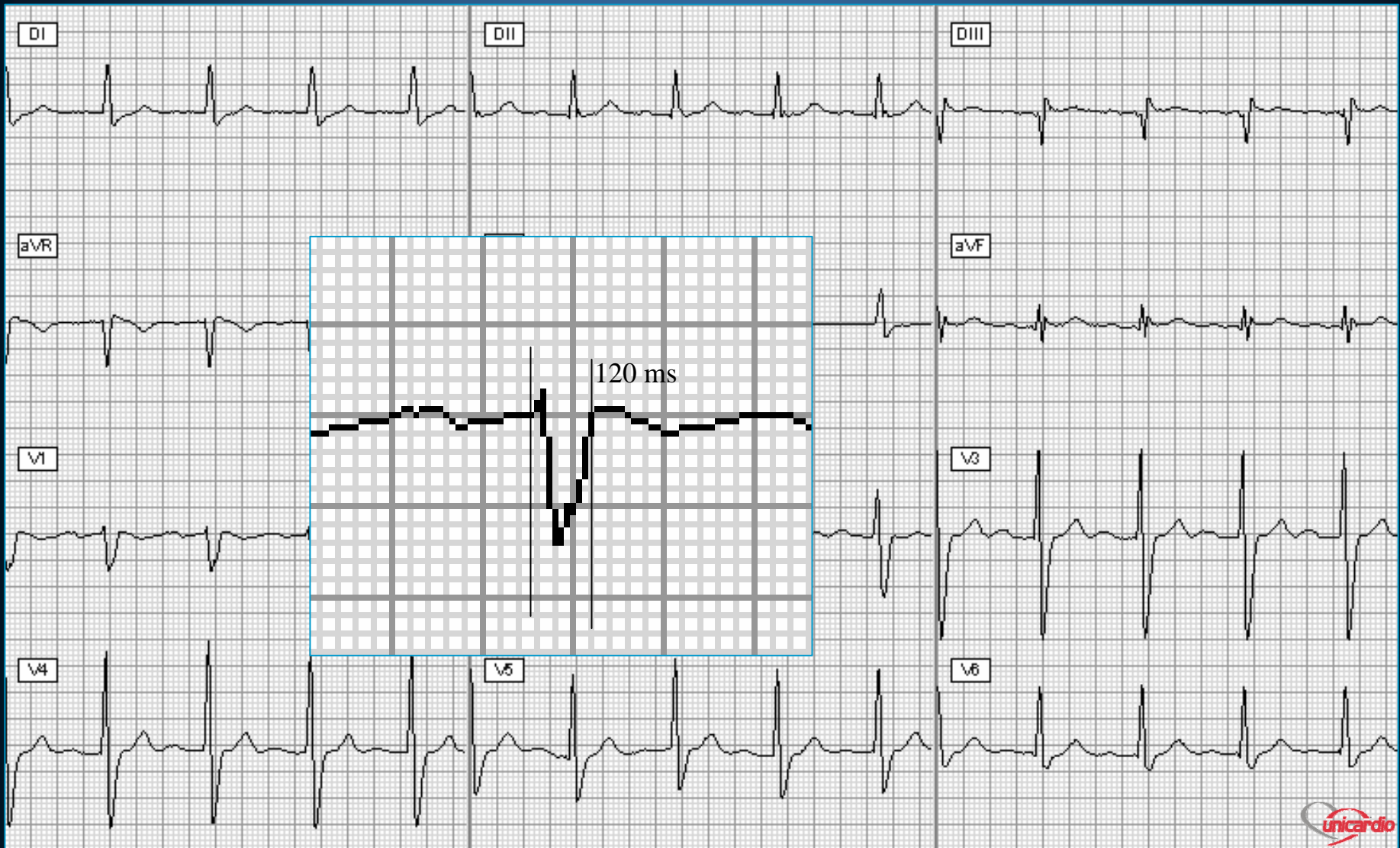




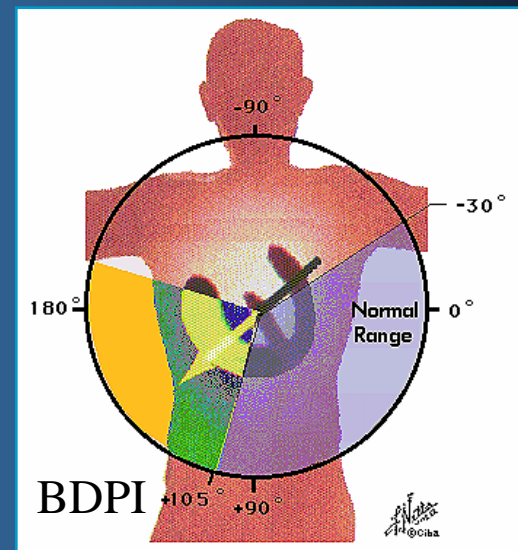
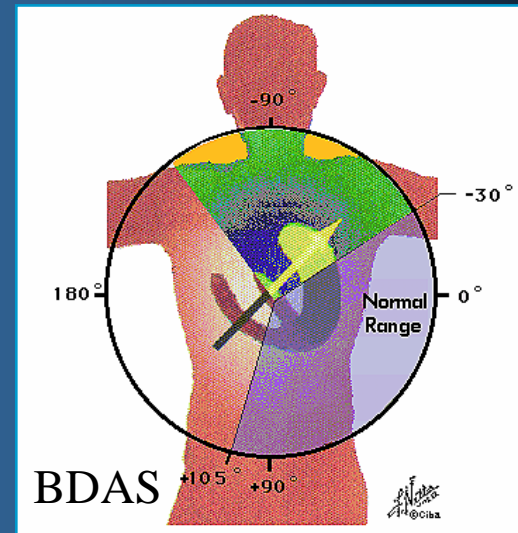
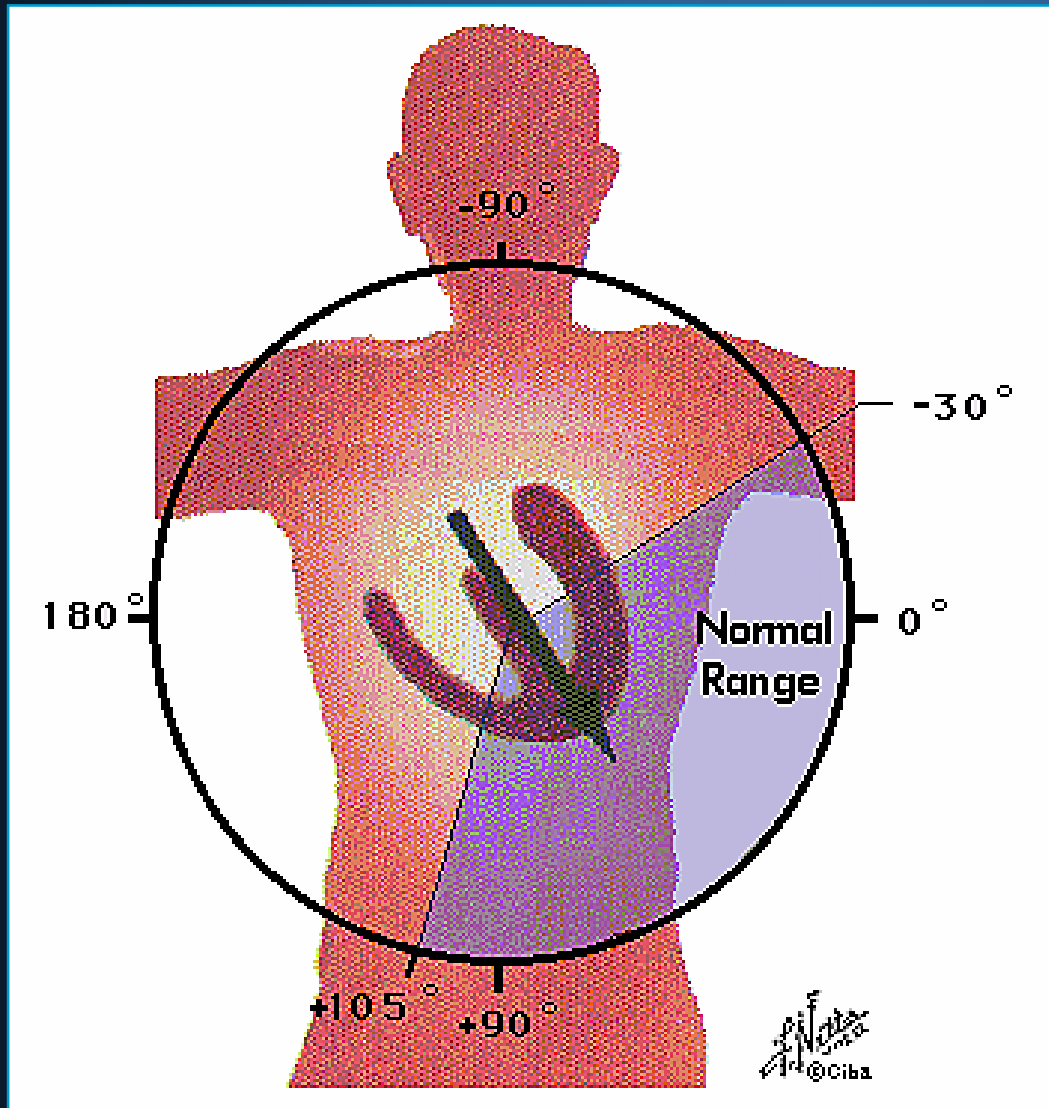
# Bloqueio do Ramo Esquerdo



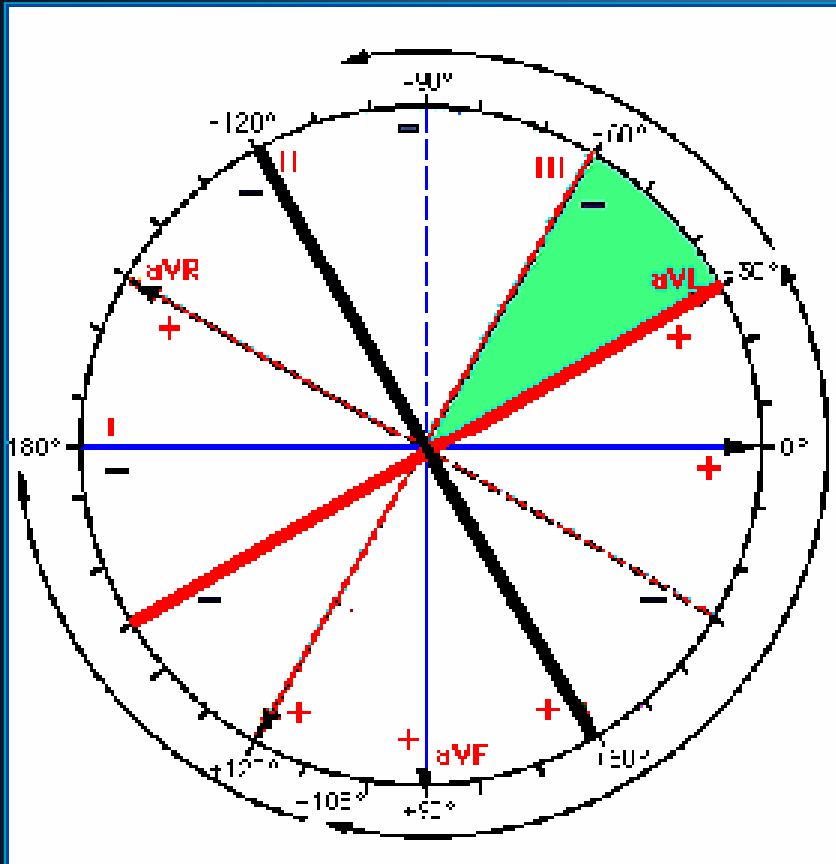
# Distúrbio de Condução Inespecífico



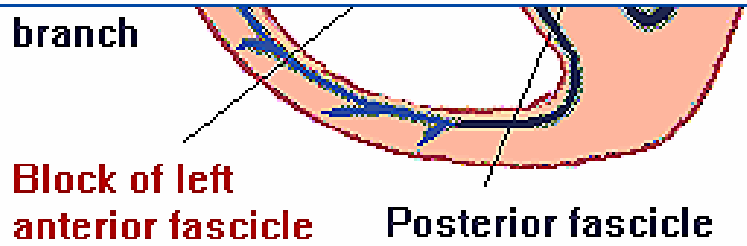
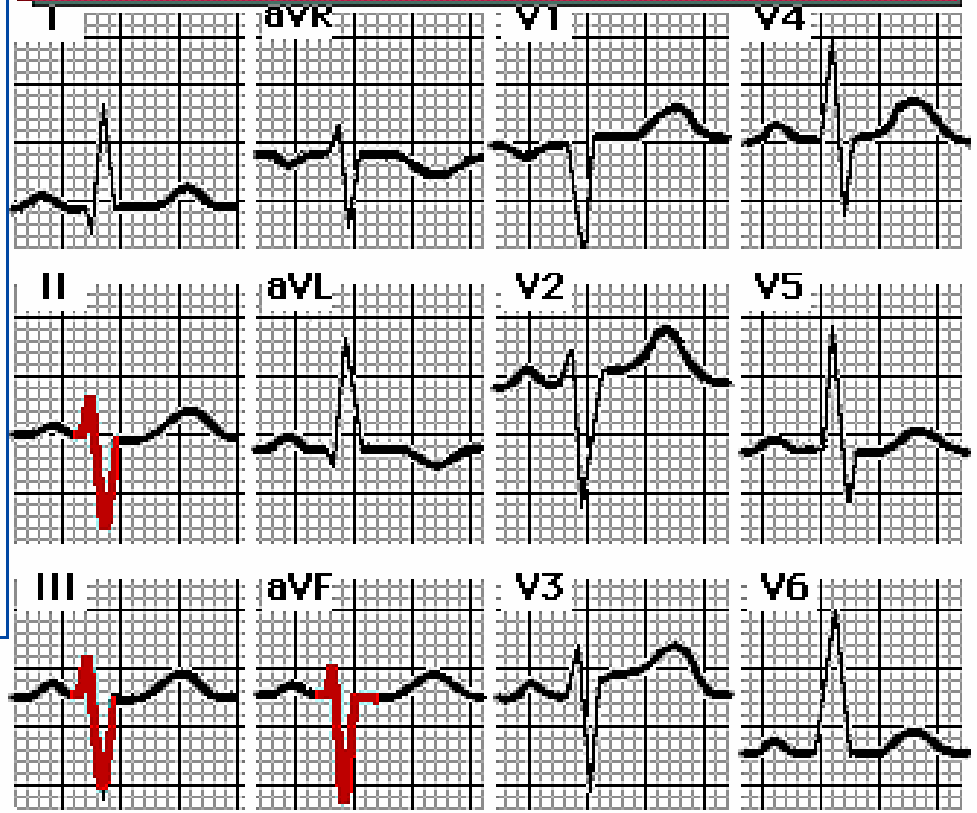
# Bloqueios Divisionais do Ramo Esquerdo



# BDAS do Ramo Esquerdo

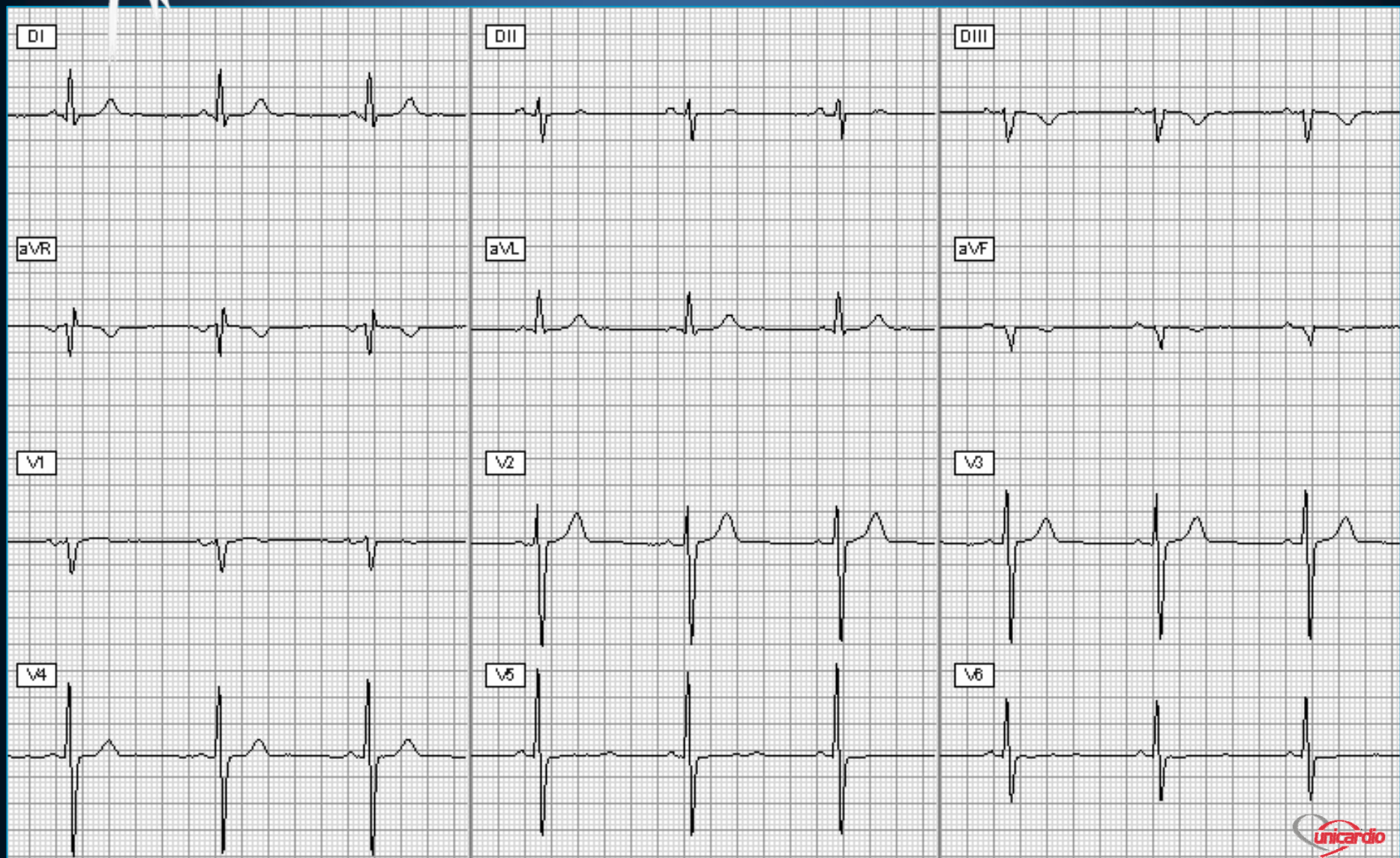


QRS complex of normal duration (<0.11 second in all leads)  
 S wave > R wave in leads II, III, and aVF  
 (marked left axis deviation)



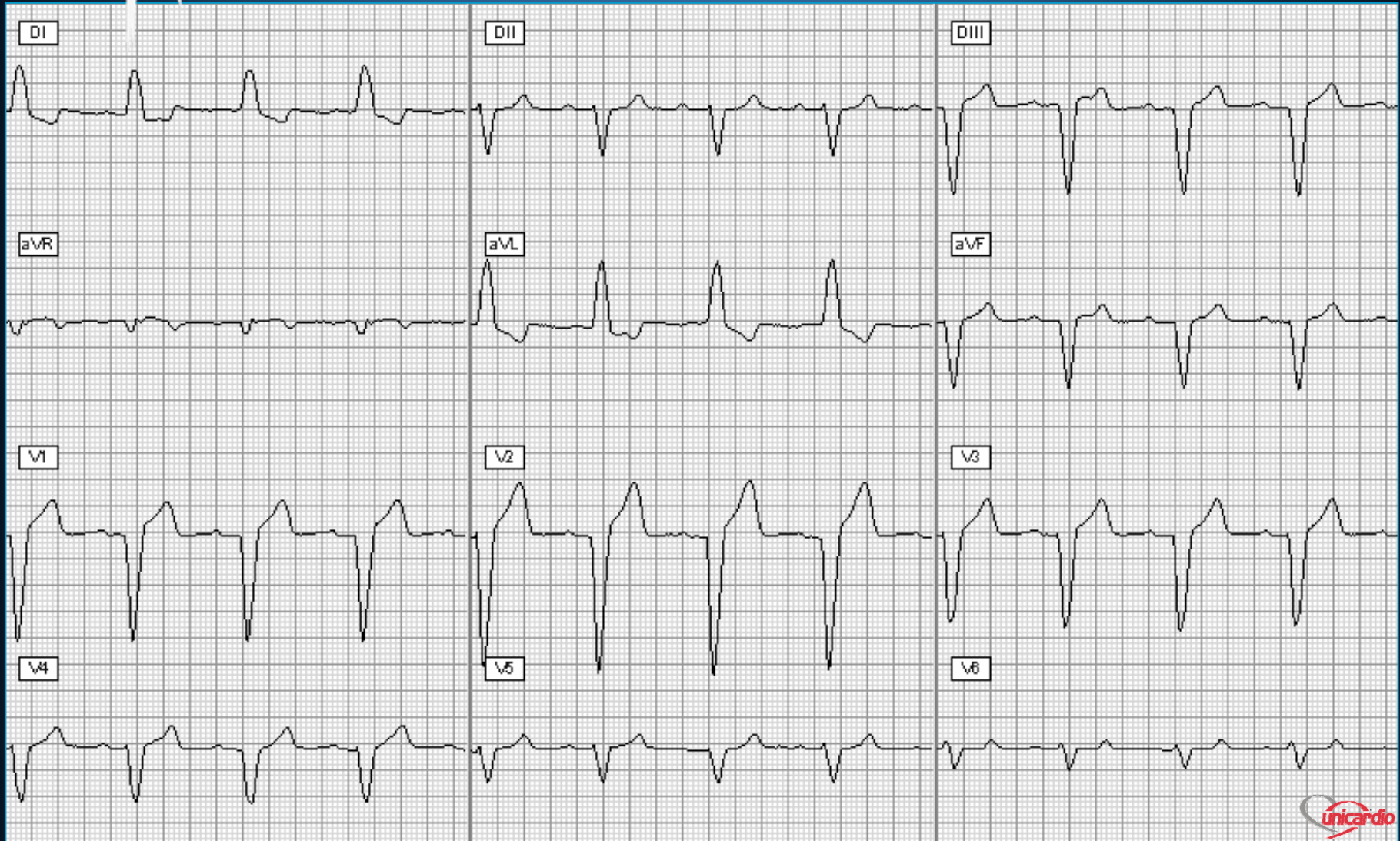


# BDAS do Ramo Esquerdo



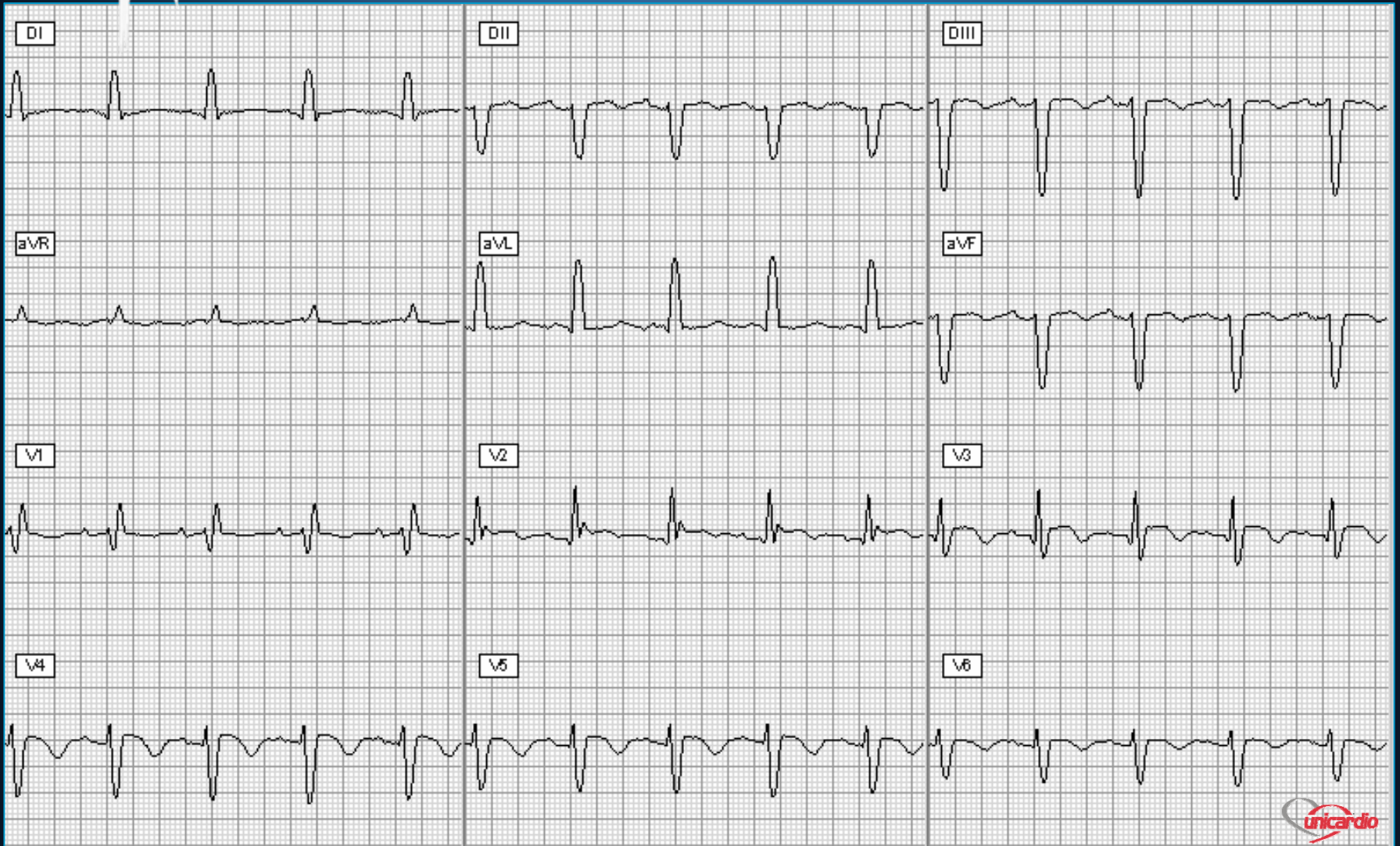


# Bifascicular: BRE + BDAS





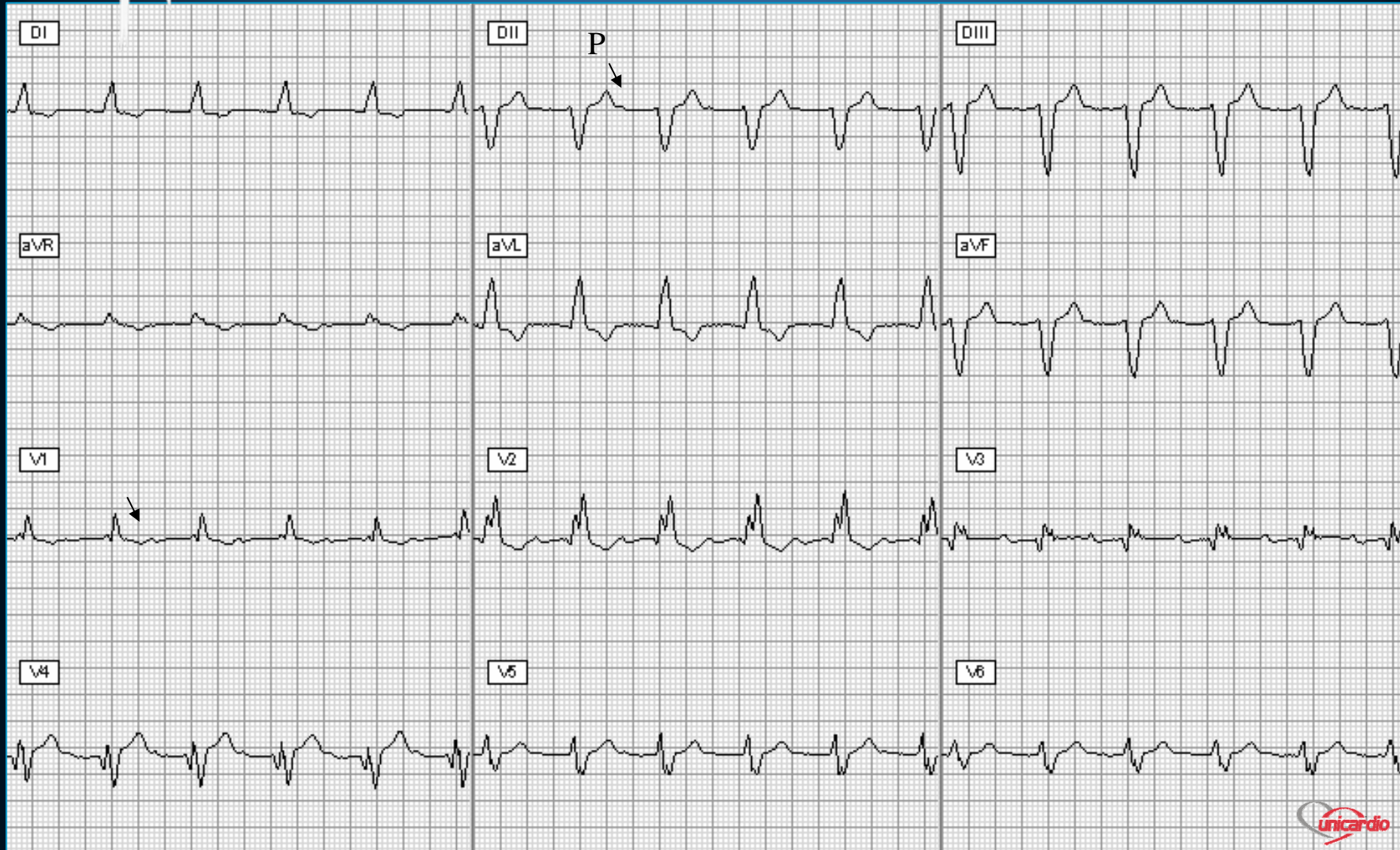
# Bifascicular: BRD + BDAS





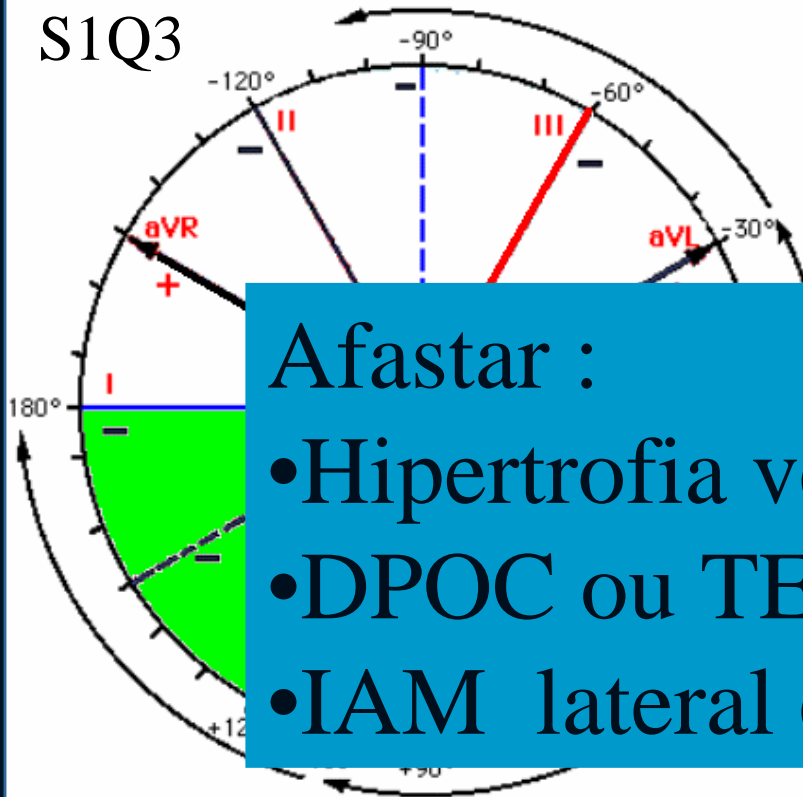


# BRD + BDAS + BAV 1° Grau



# BDPI do Ramo Esquerdo

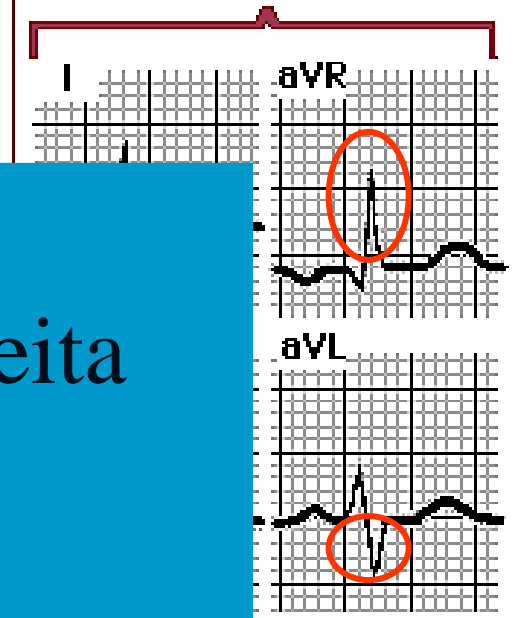
S1Q3



**BEFORE** posterior fascicular block



**AFTER** posterior fascicular block



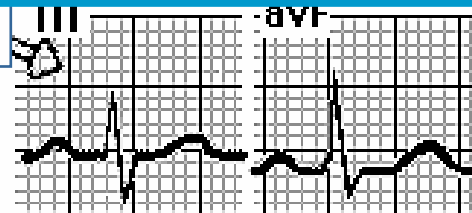
Afastar :

- Hipertrofia ventricular direita
- DPOC ou TEP
- IAM lateral extenso

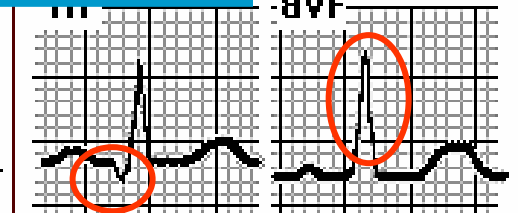
branch

Left anterior fascicle

Block of left posterior fascicle



QRS axis = +30 deg.



QRS axis = +75 deg.

# EEF nos bloqueios de ramo



## Classe I:

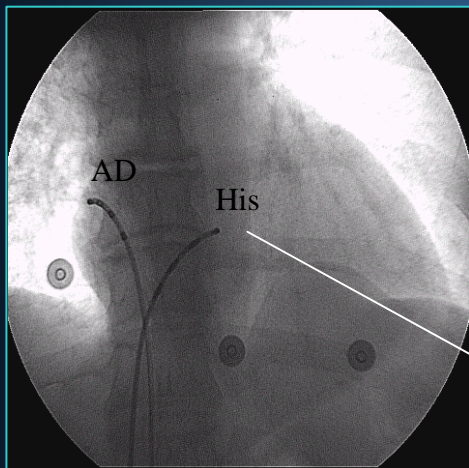
- Sintomáticos, com causa dos sintomas desconhecida (BAV intermitente? TVS?)

## Classe II:

- Assintomáticos em que se pretenda usar medicação potencialmente deletéria à condução

## Classe III:

- Assintomáticos com bloqueio de ramo
- Sintomáticos com outras causas correlacionadas negativa ou positivamente ao ECG



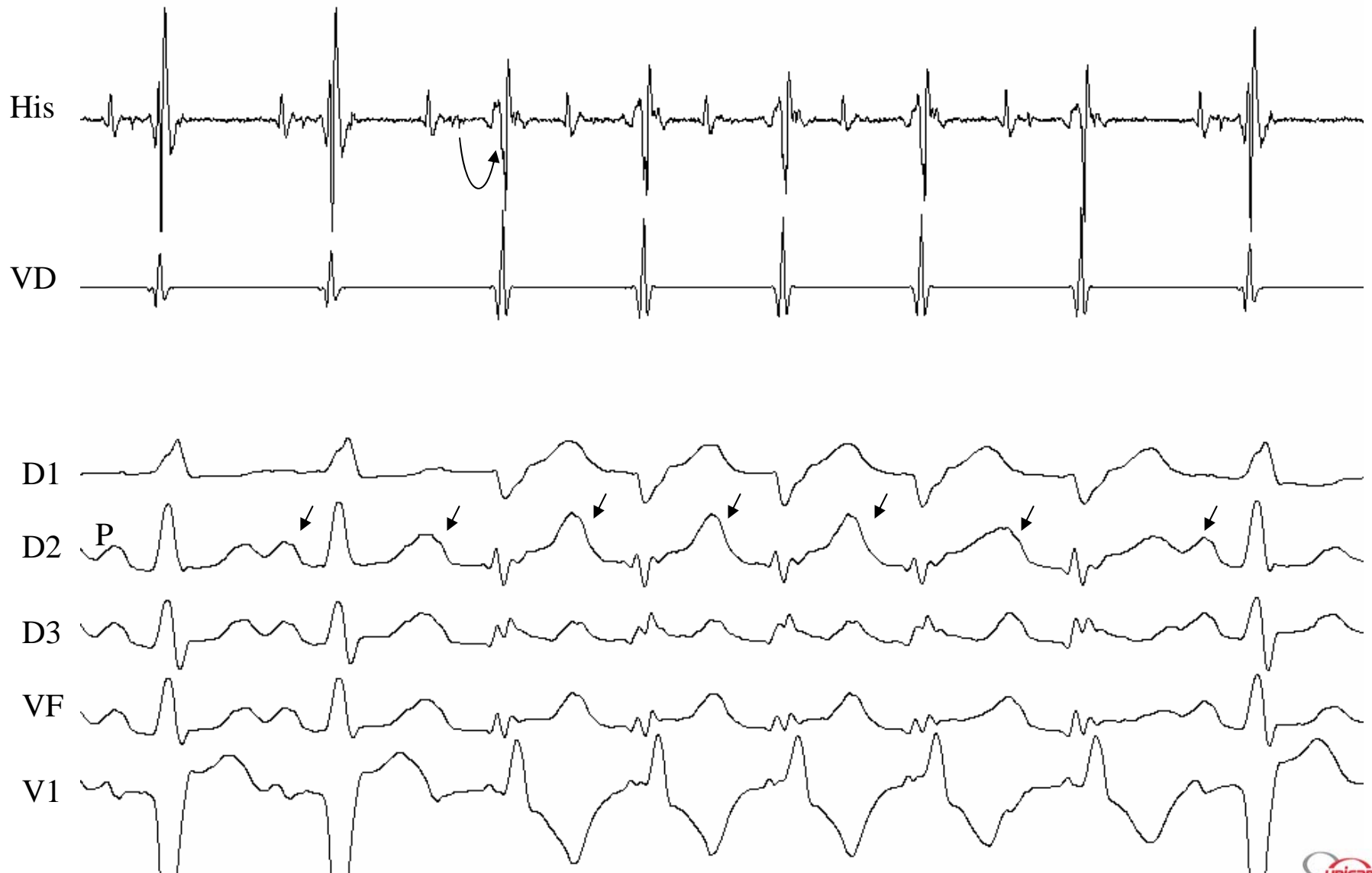
## EEF: Bloqueios de Ramo e Risco de Bloqueio AV



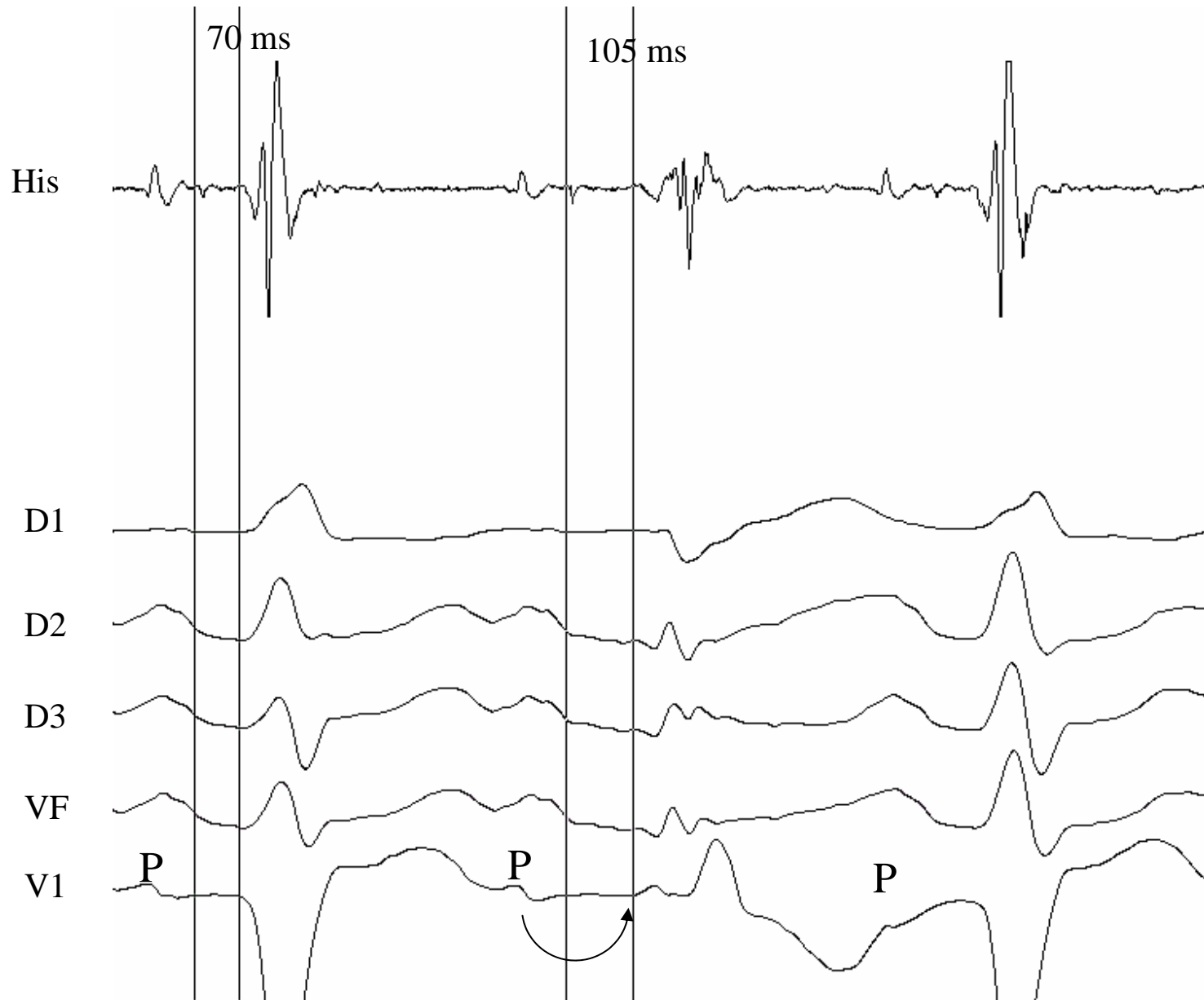
- PR isoladamente não é importante
- **BR alternante**: alto VPP, pouco sensível (> risco se batimento a batimento e com  $\Delta$  PR)
- **HV > 100 ms**: alto VPP, pouco sensível;  
    > 80 ms:  $\leq 6\%$  ao ano, não estratifica
- **BAV 2° MII ou 3°** com “pace” atrial < 150 ppm
- PRE-HP  $\geq 450$  ms,  $\uparrow$  c/ $\downarrow$  ciclo do “pace”
- Procainamida (HV >2x, > 100 ms ou BAV infra His)

ES 156

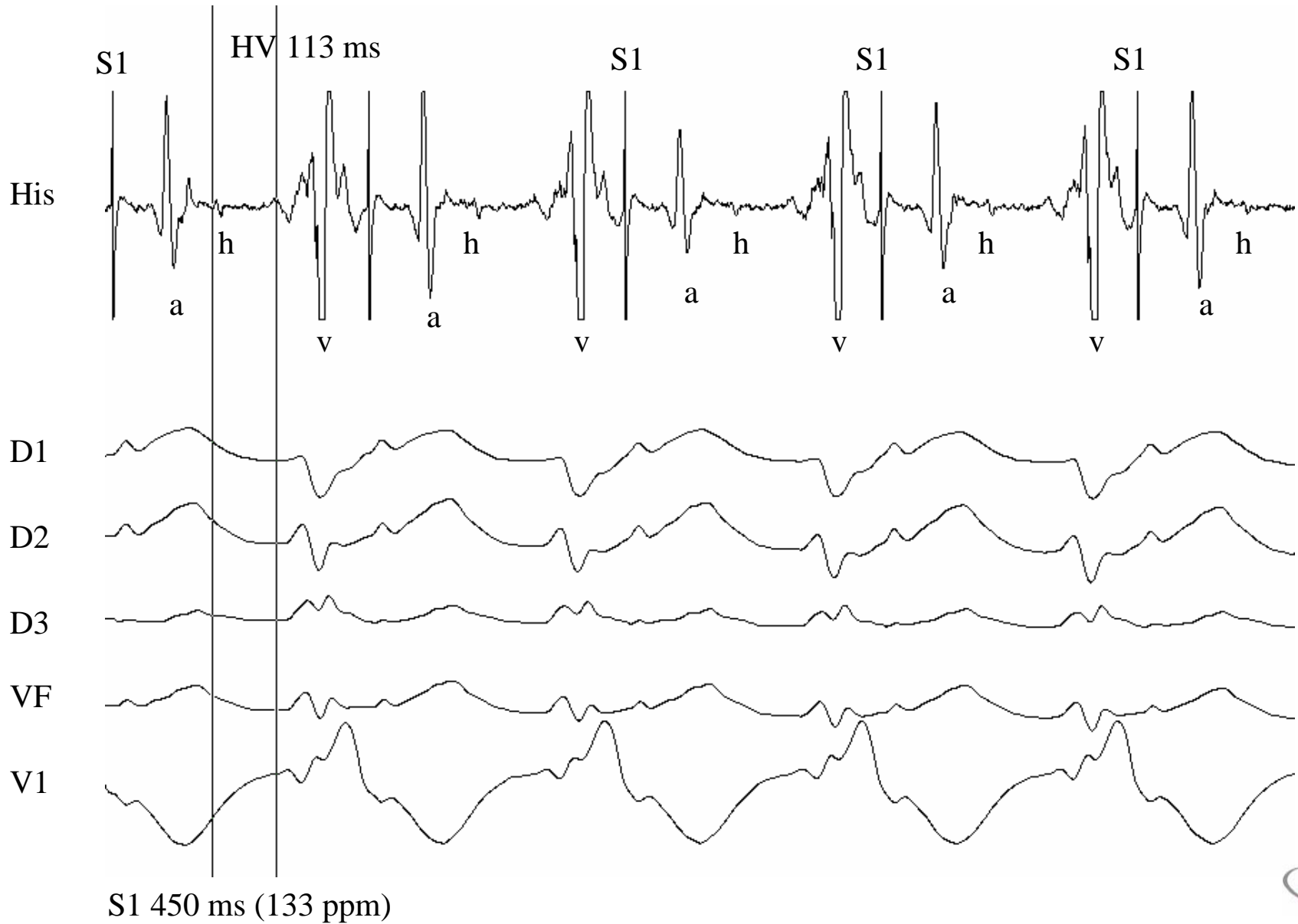
# Bloqueio de ramo alternante após procainamida



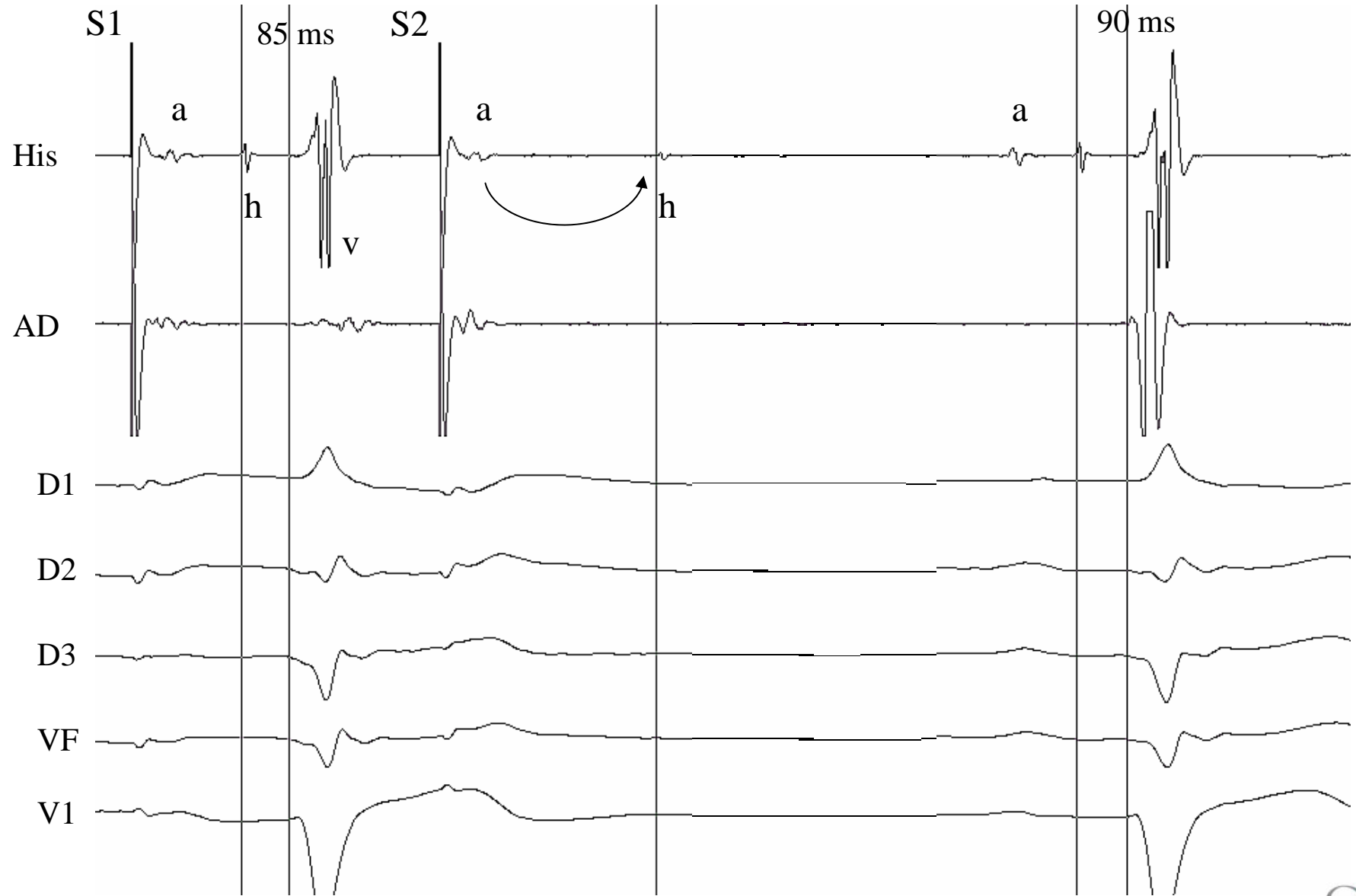
# ES 156 HV Após Procainamida (10 mg/Kg)



# ES 156 Estimulação do AD após procainamida



# Estimulação do AD e HV Após Procainamida (10 mg/Kg)





# Bloqueio de Ramo e Marcapasso



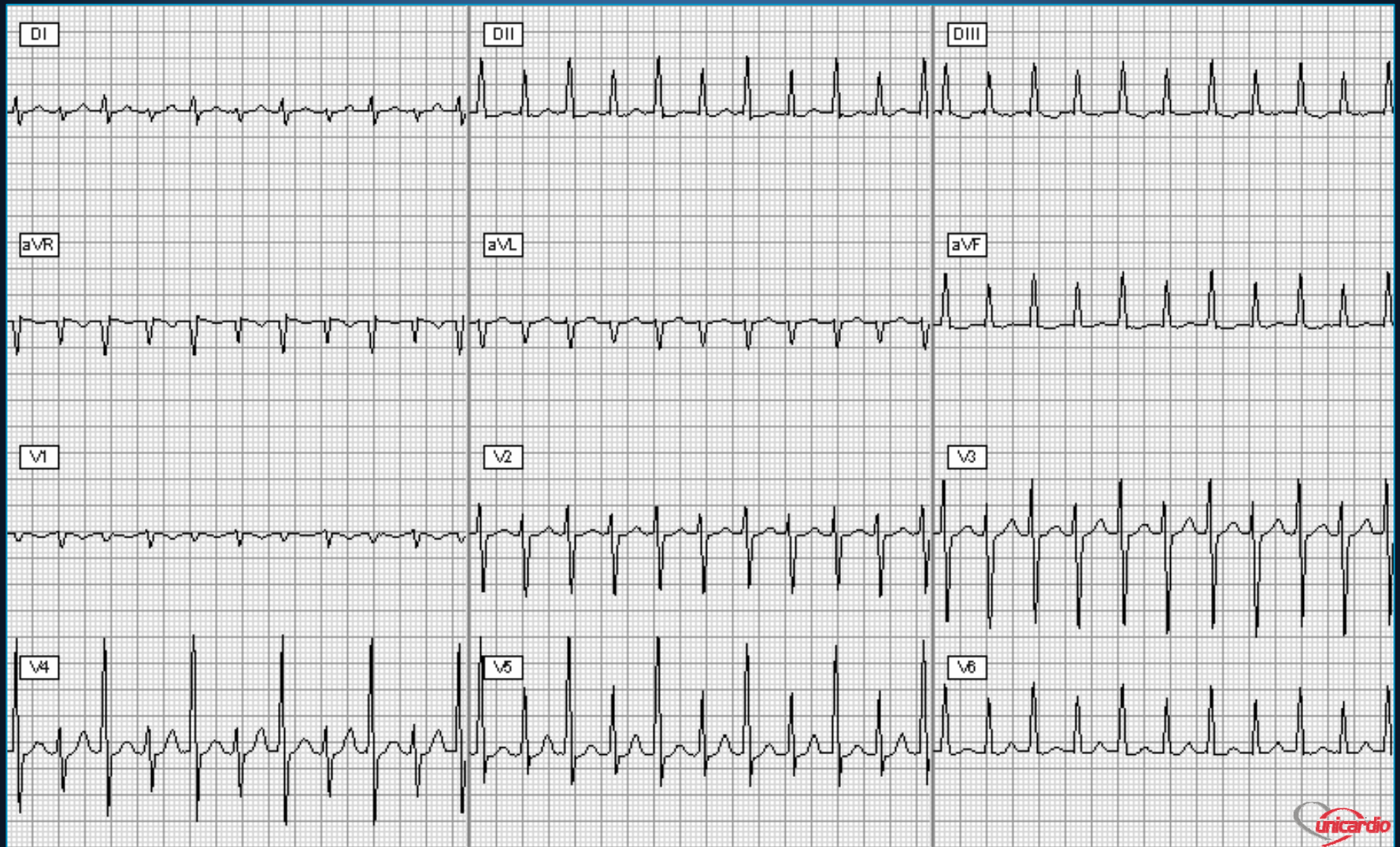
	HV < 55	HV 60-99	HV > 100 ms
BRE, BRD, DCIV	Não*	Sim, c/sintomas †	Sim†
BRE+BDAS ou BDPI	Não*	Sim, c/sintomas †	Sim†
BR Alternante	†	Sim	Sim
Bloqueio após o His > 150 bpm	Não*	Sim, c/sintomas ‡	Sim

\* Salvo síncope recorrente documentada sem outras causas

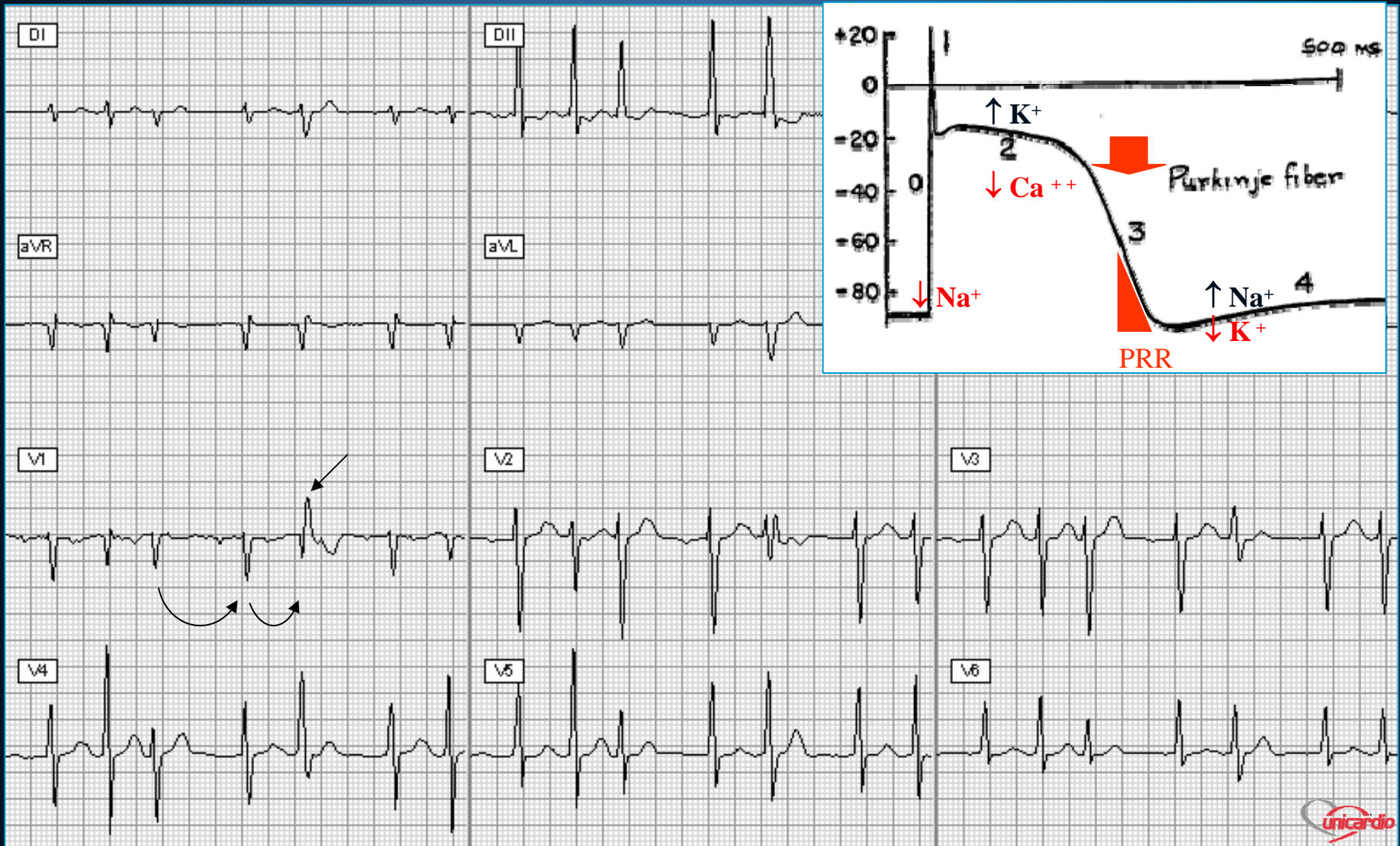
† Síncope ou Pré-síncope, excluídas causas não cardíacas e não taquicárdicas

‡ Raramente ocorre

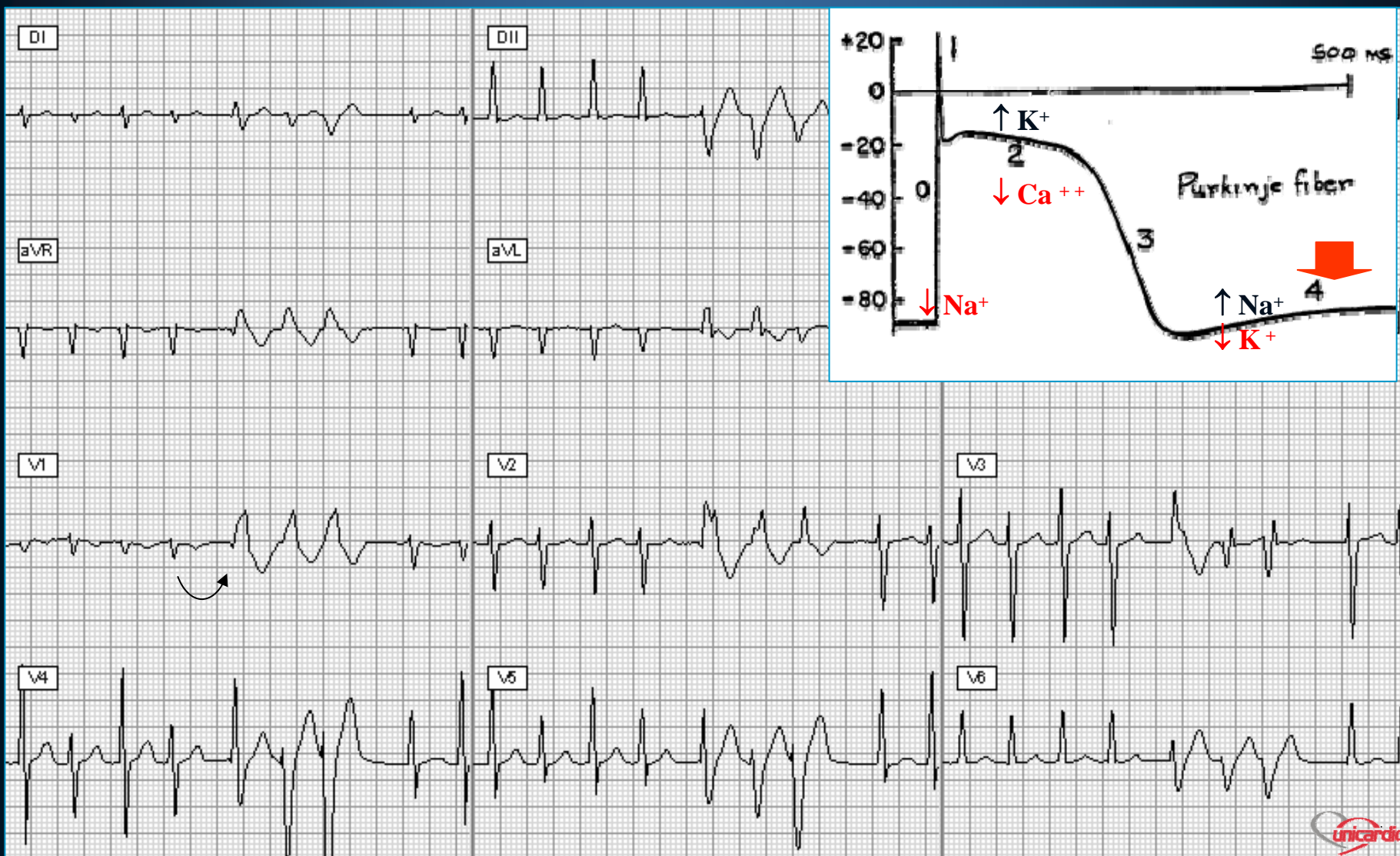
# Taquicardia Atrial: Alternância Elétrica



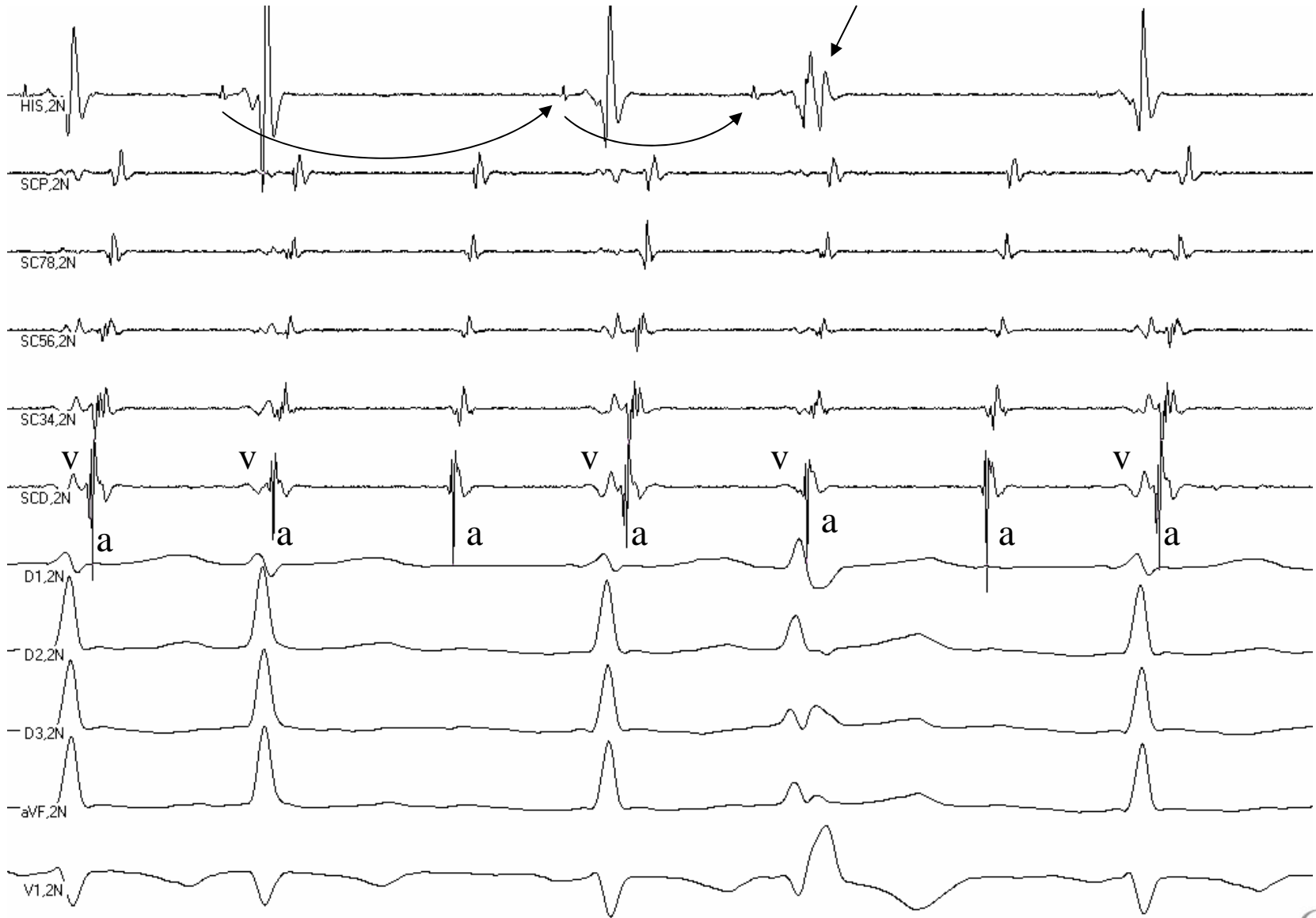
# TA e Aberrância: Bloqueio de Fase 3



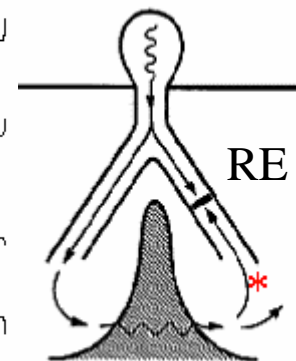
# Aberrância: Bloqueio de Fase 4



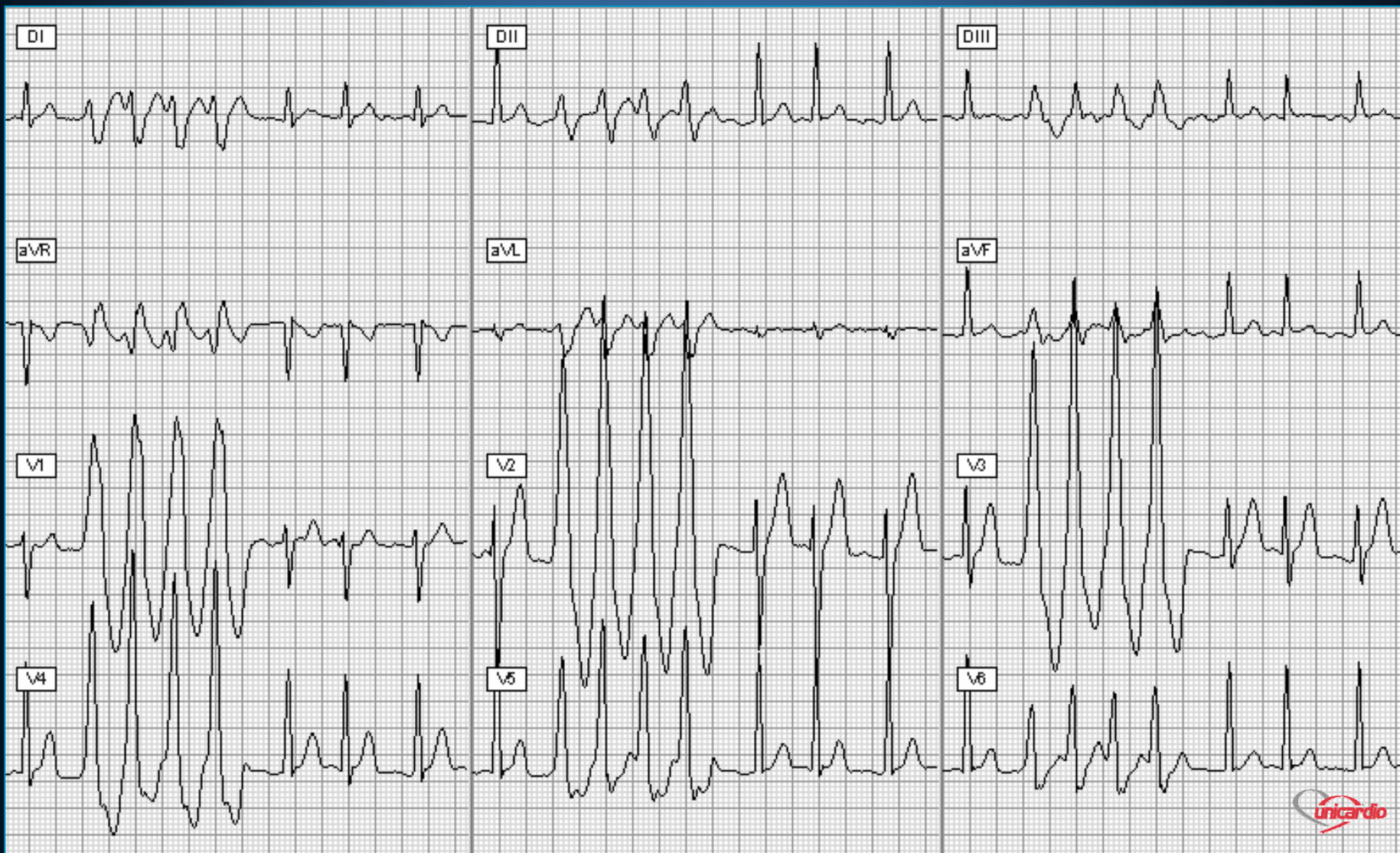
# Taquicardia Atrial e Bloqueio de Fase 3



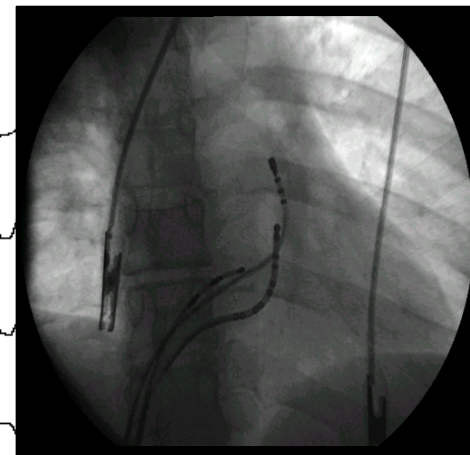
# Fibrilação Atrial e Fenômeno de Ashman



# FA e WPW Lateral Esquerdo

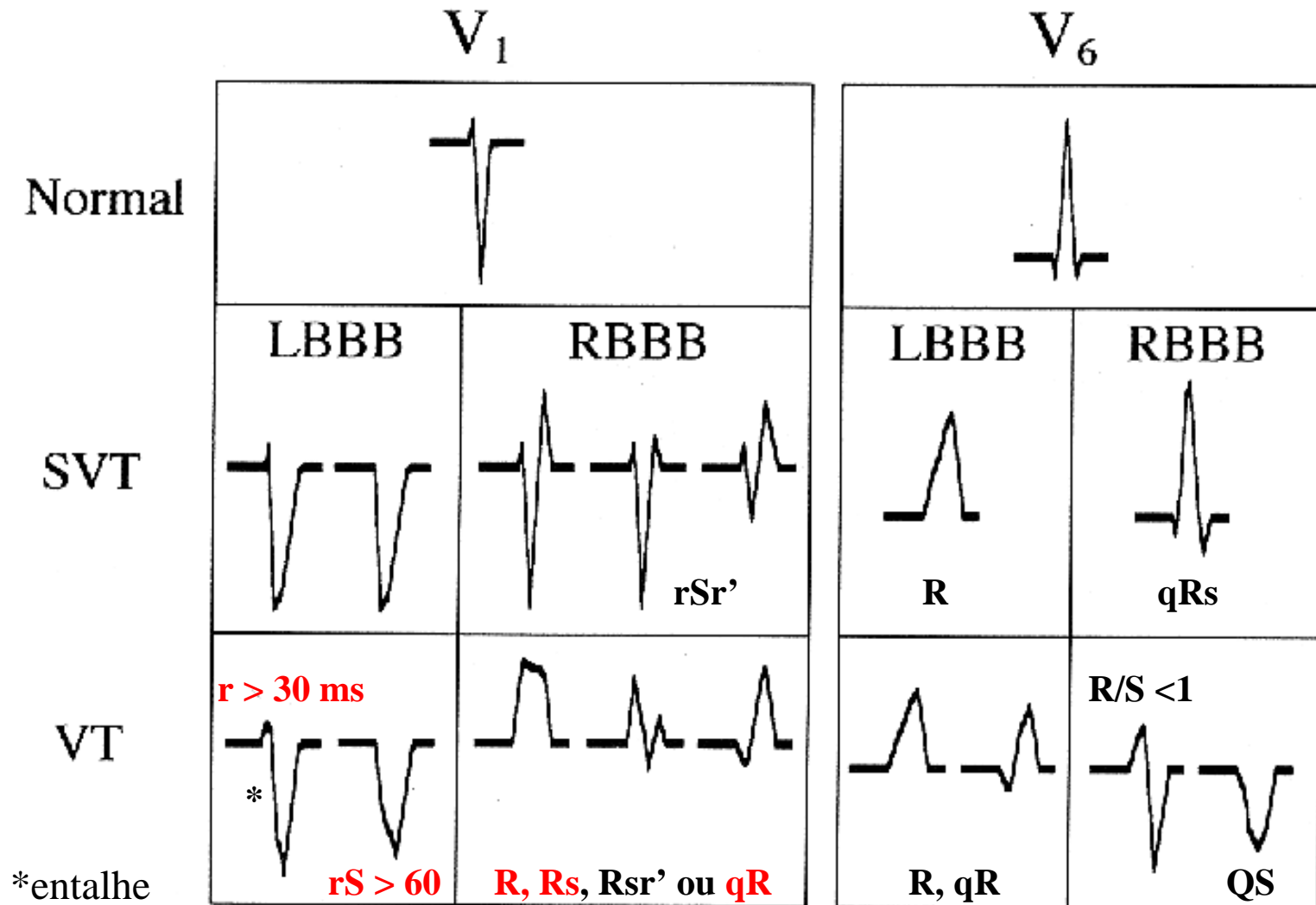


# FA e TVNS da Via de Saída do VD

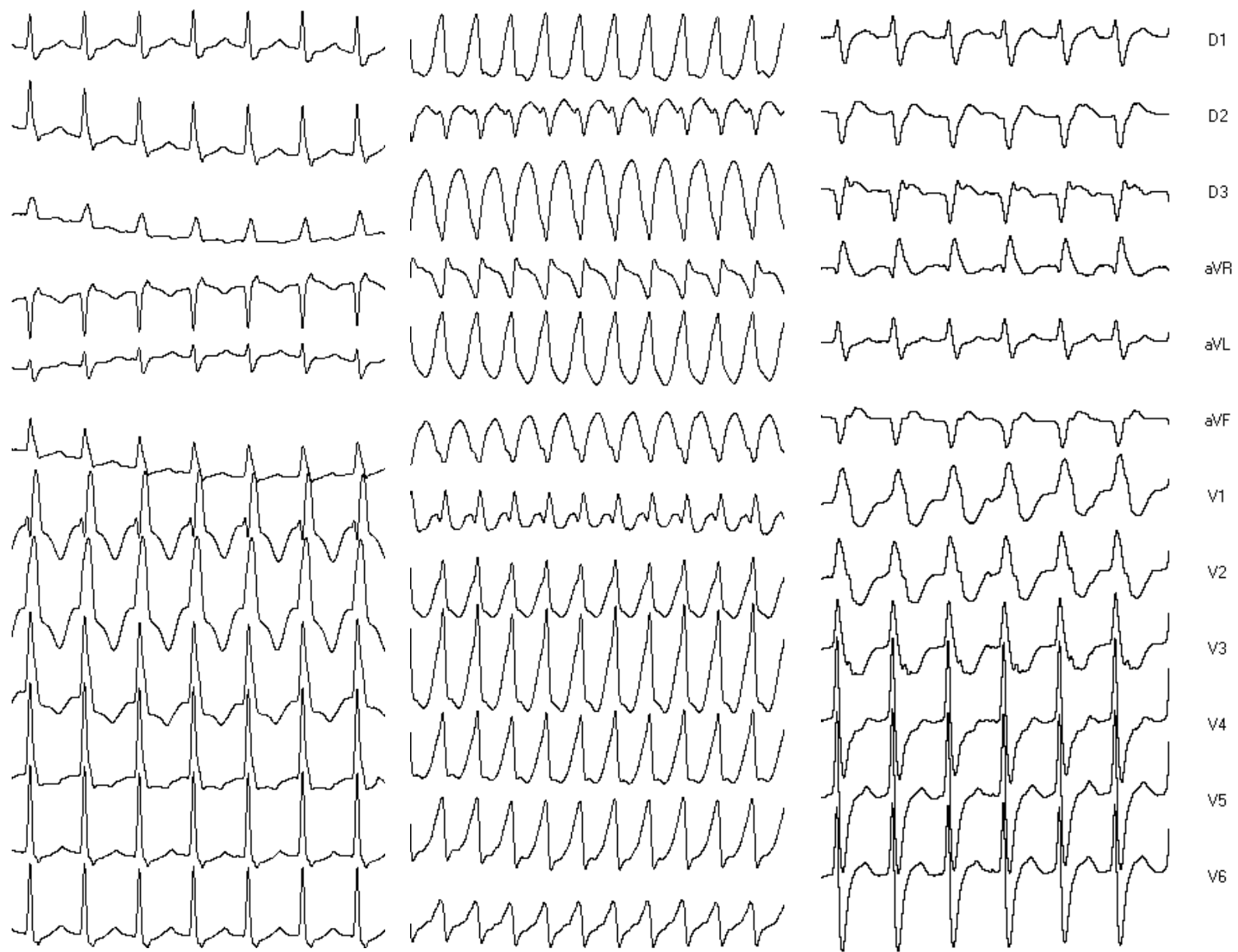




# TVS: Critérios Morfológicos



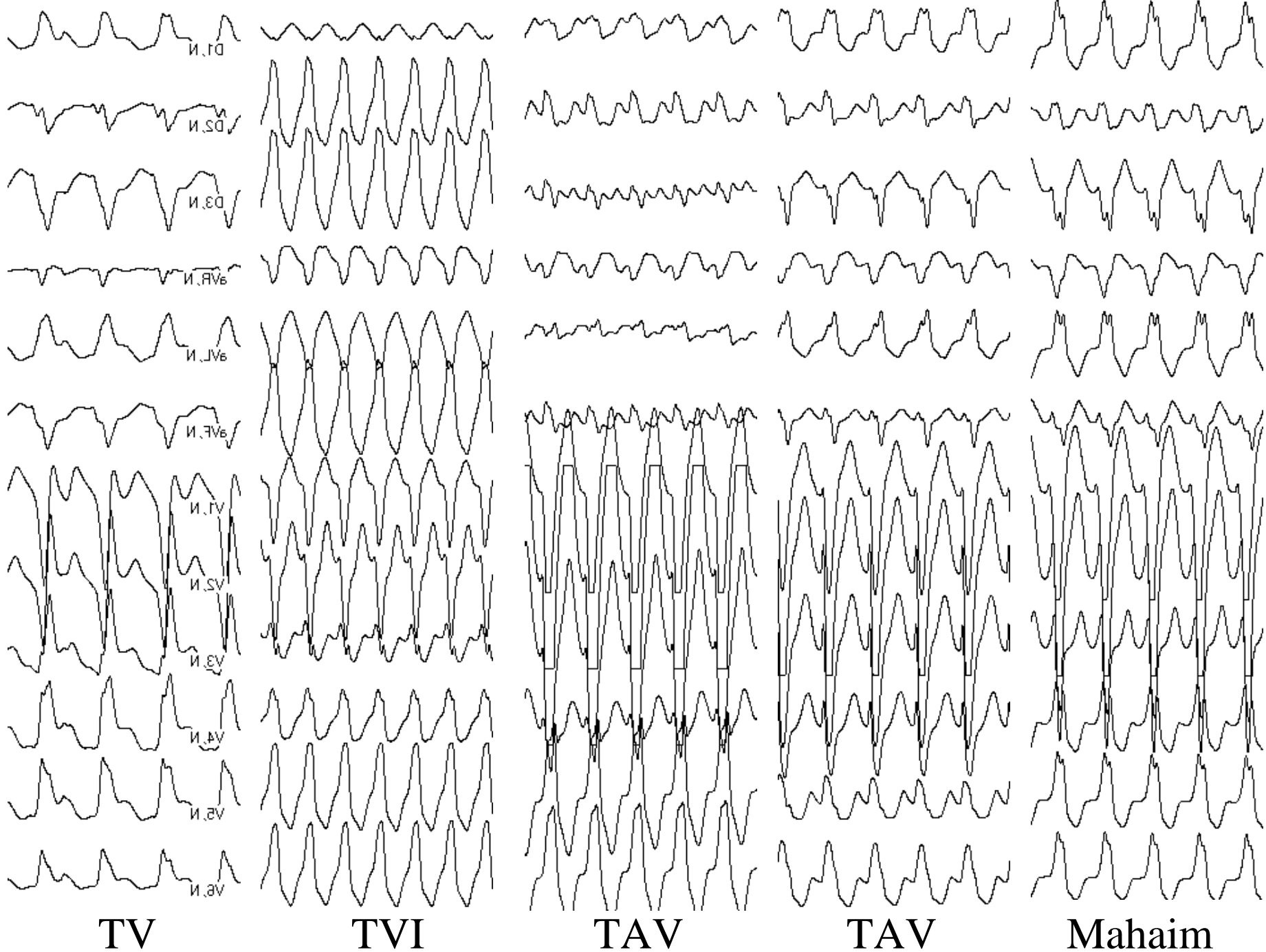
\*entalhe



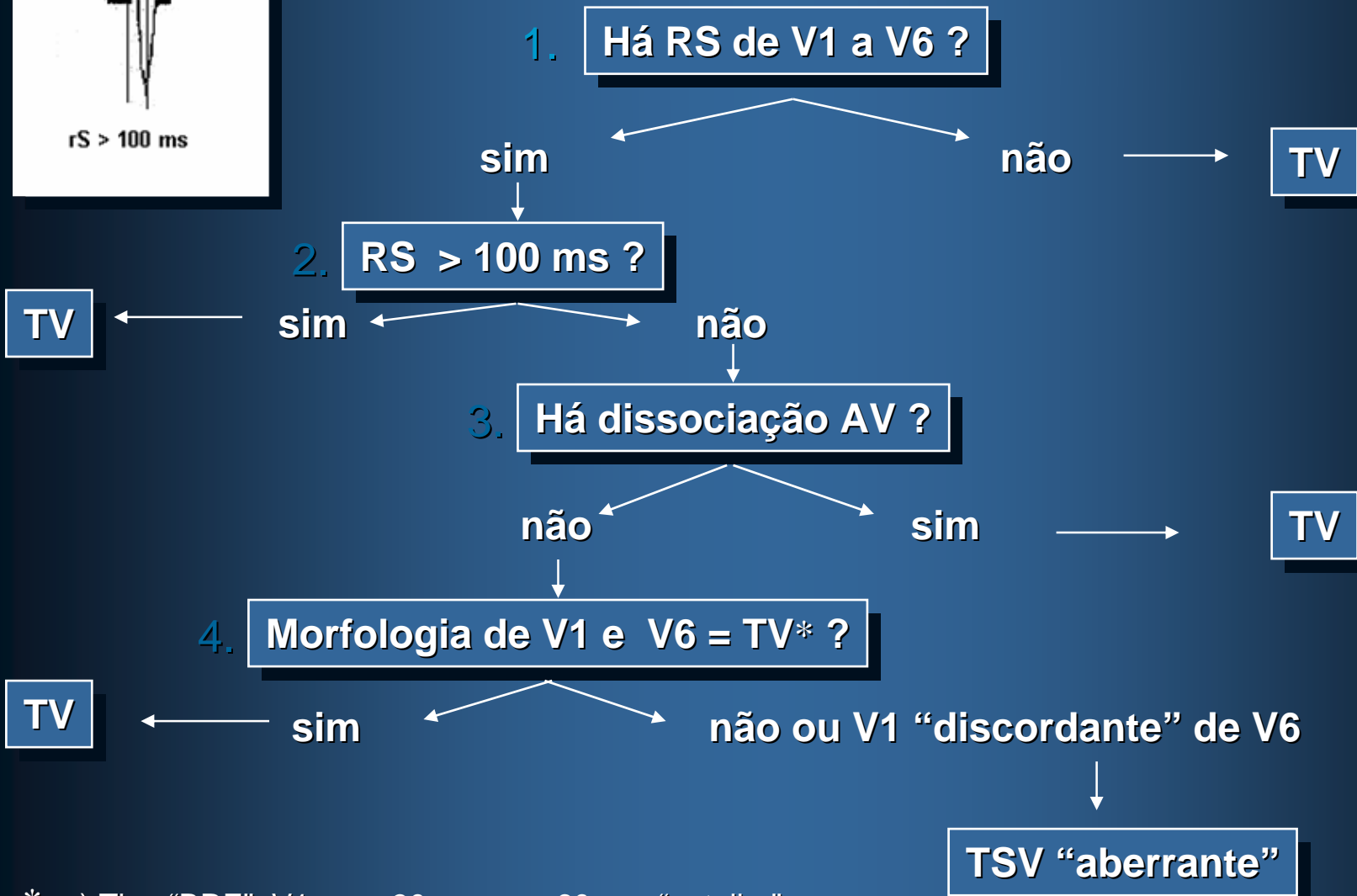
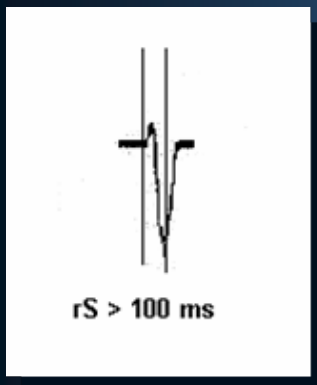
TRN

TVS

TVS



# Algoritmo Diferencial de Brugada et al



- \* a) Tipo “BRE”: V1 = r > 30 ms, rs > 60 ms, “entalhe” de s; V6 = qualquer morfologia  
b) Tipo “BRD”: V1 = qR ou R, V6 = rS < 1, qS, qR