

Curso Nacional  
de Reciclagem em  
Cardiologia da  
Região Sul



# Bloqueios de Ramo

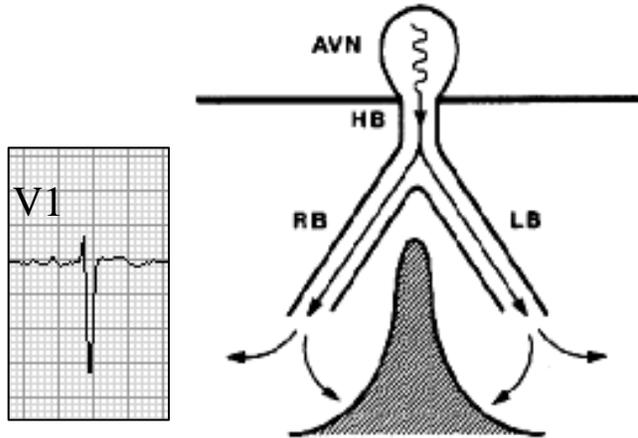
Andrei Lewandowski

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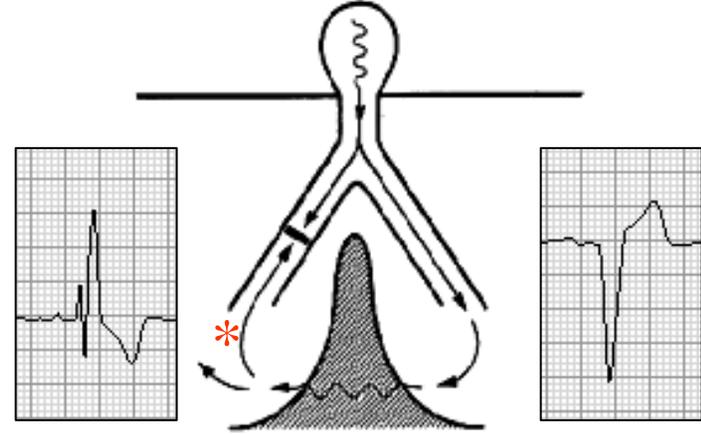


Unicardio HSC Blumenau  
SOS Cardio Florianópolis  
IC - SES - São José

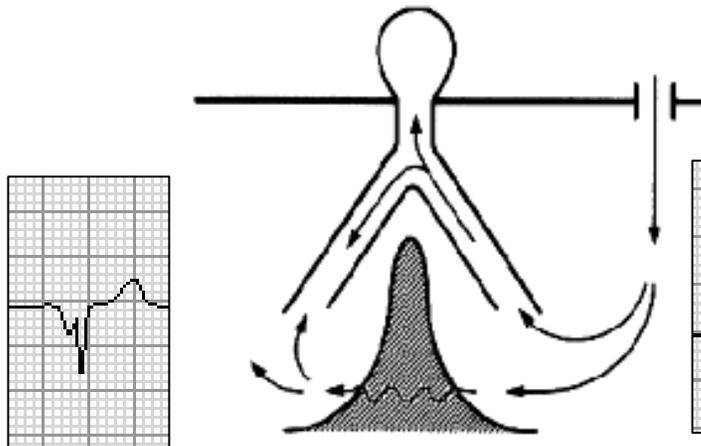
## QRS Estreito



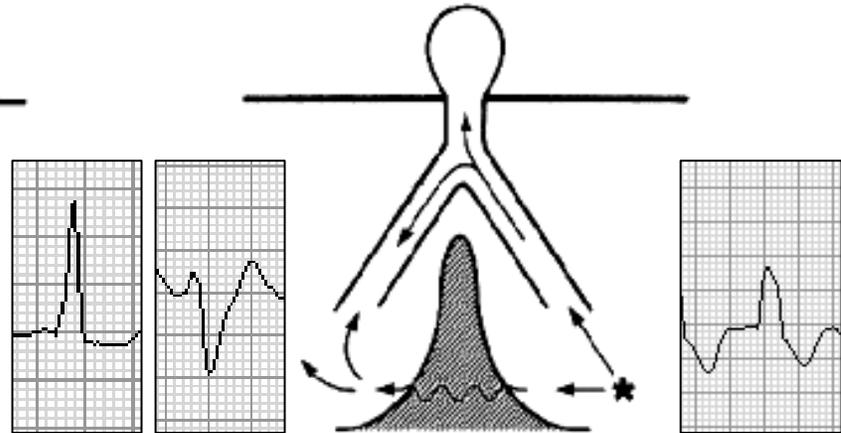
## QRS Largo - B. de Ramo (Condução Aberrante)



## QRS Largo - Preexcitação (Via Acessória)



## QRS Largo (TV)





# Bloqueios de Ramo

## Causas

### Idiopático

Degenerativo (Lev, Lenègre)

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

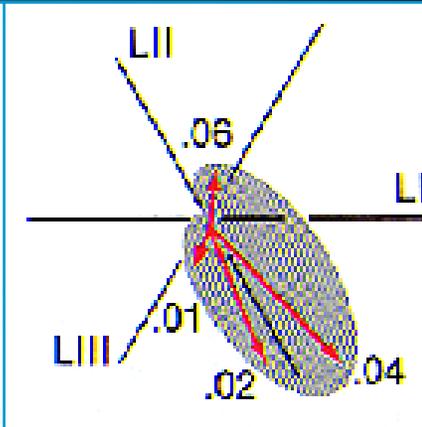
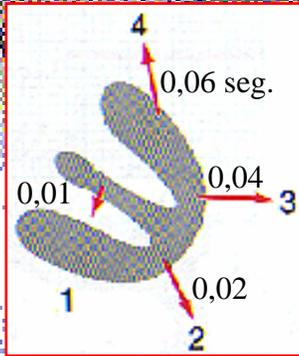
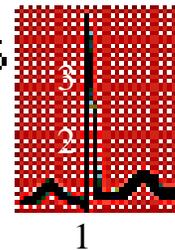
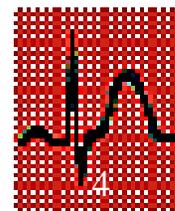
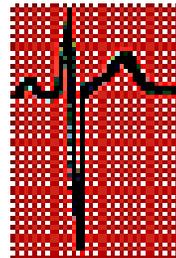
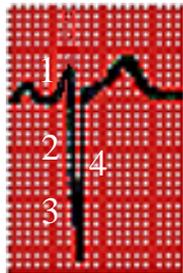
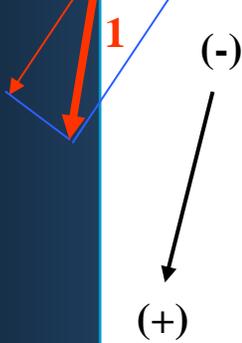
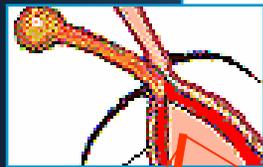
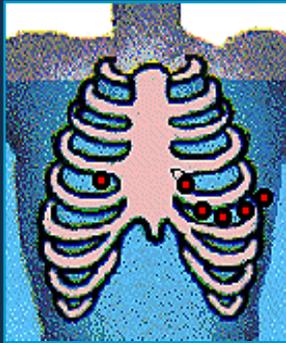
Funcionais (Aberrância de  
condução):

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

### Distúrbio de condução inespecífico

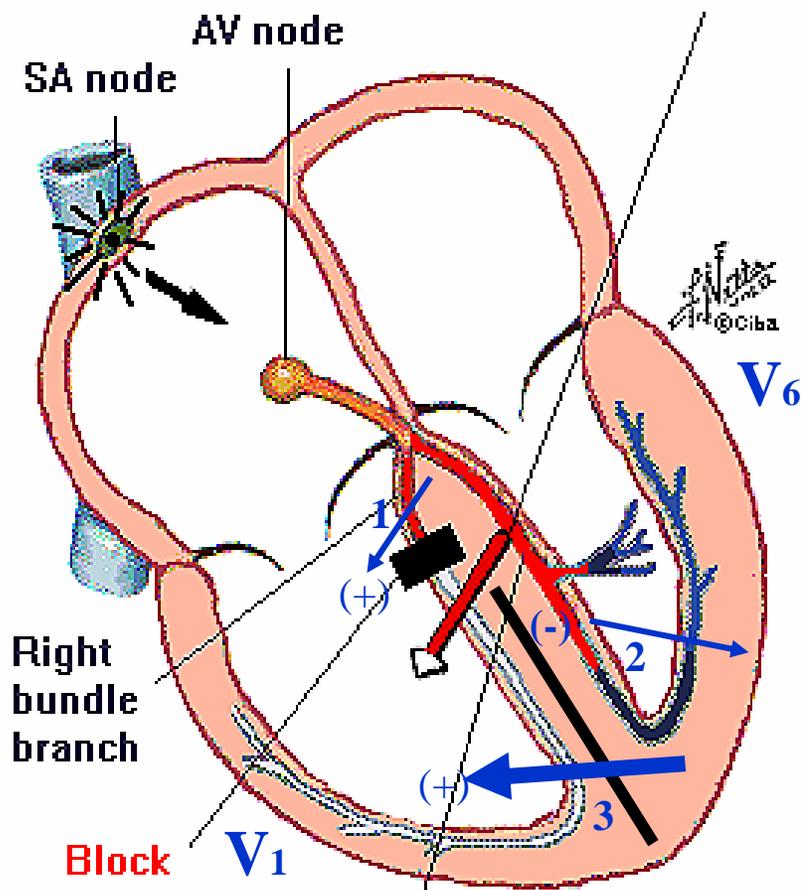
- Miocardiopatia difusa
- Antiarrítmicos classes I ou III
- Distúrbio eletrolítico
- Isquemia miocárdica

# Vetores do ÂQRS

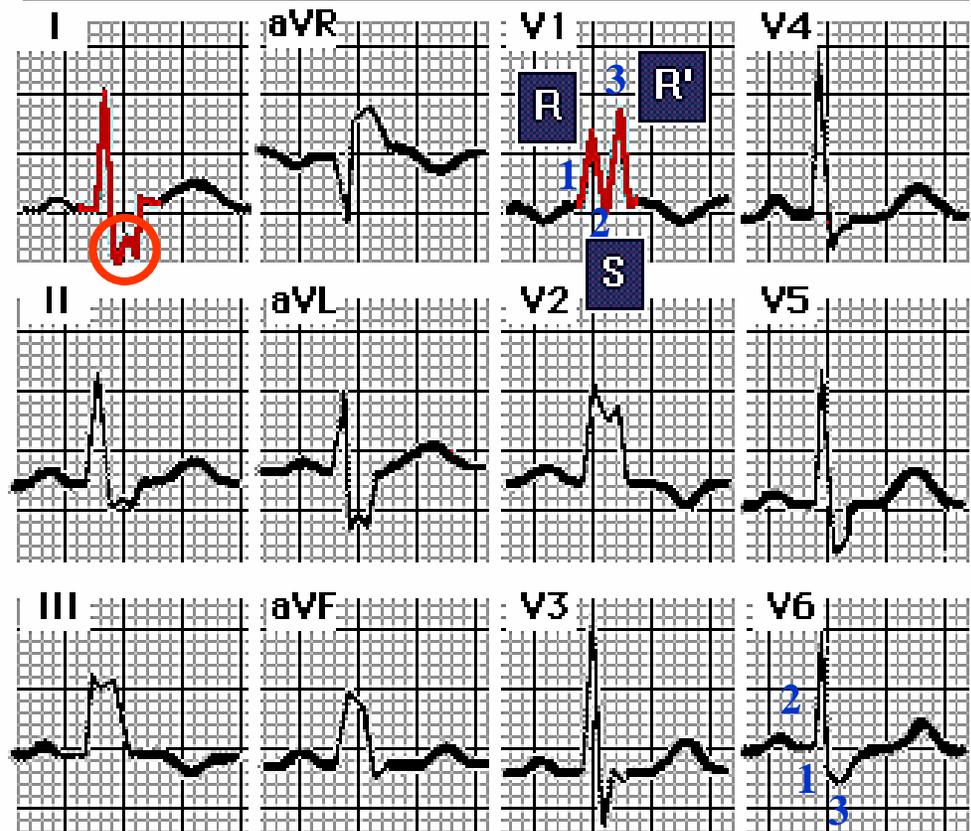


# Bloqueio do Ramo Direito

Late abnormal electrical vector bypasses block

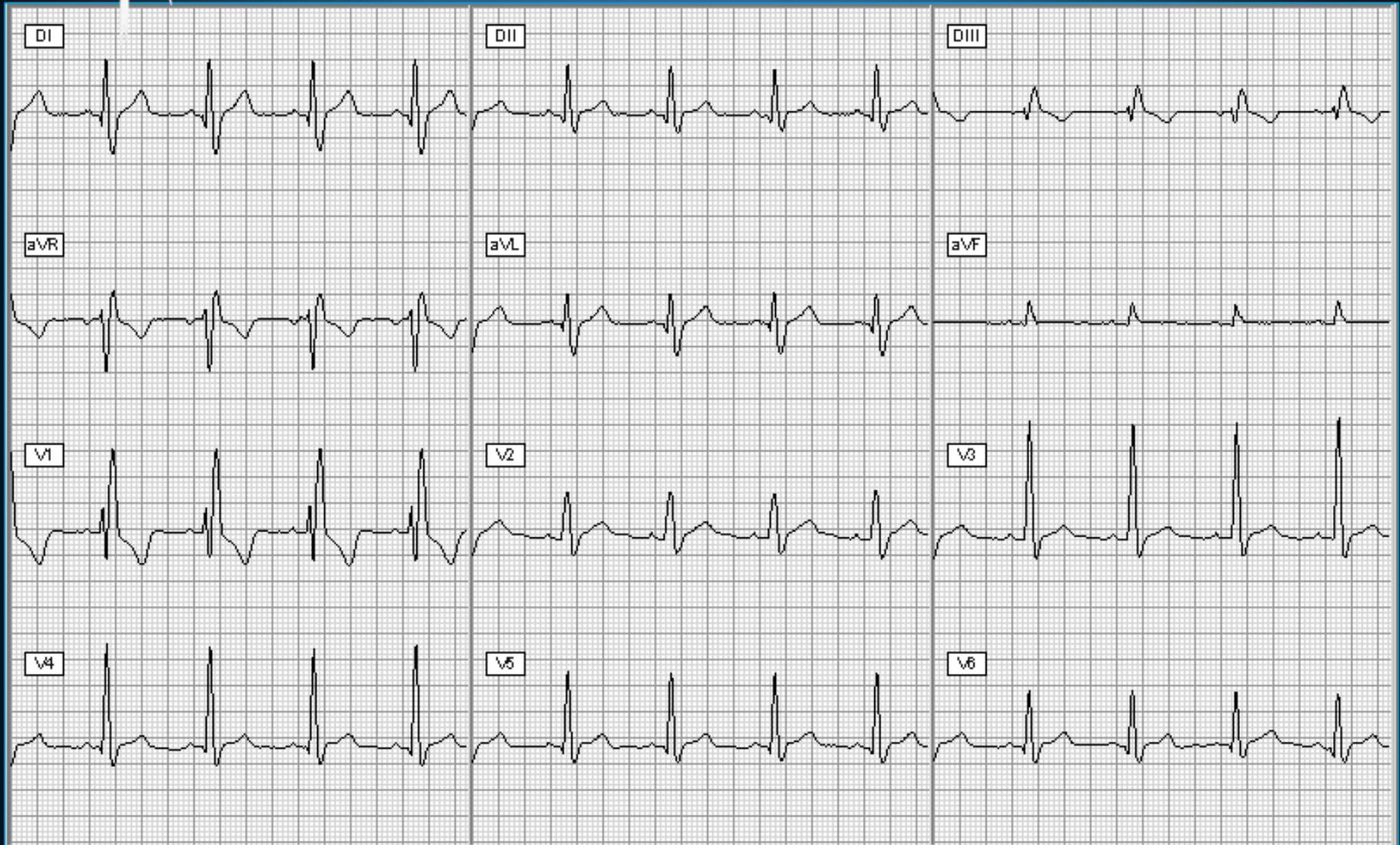


Total QRS prolonged ( $\geq 0.12$  second)  
Terminal broad S wave in lead I  
RSR' complex in lead V1

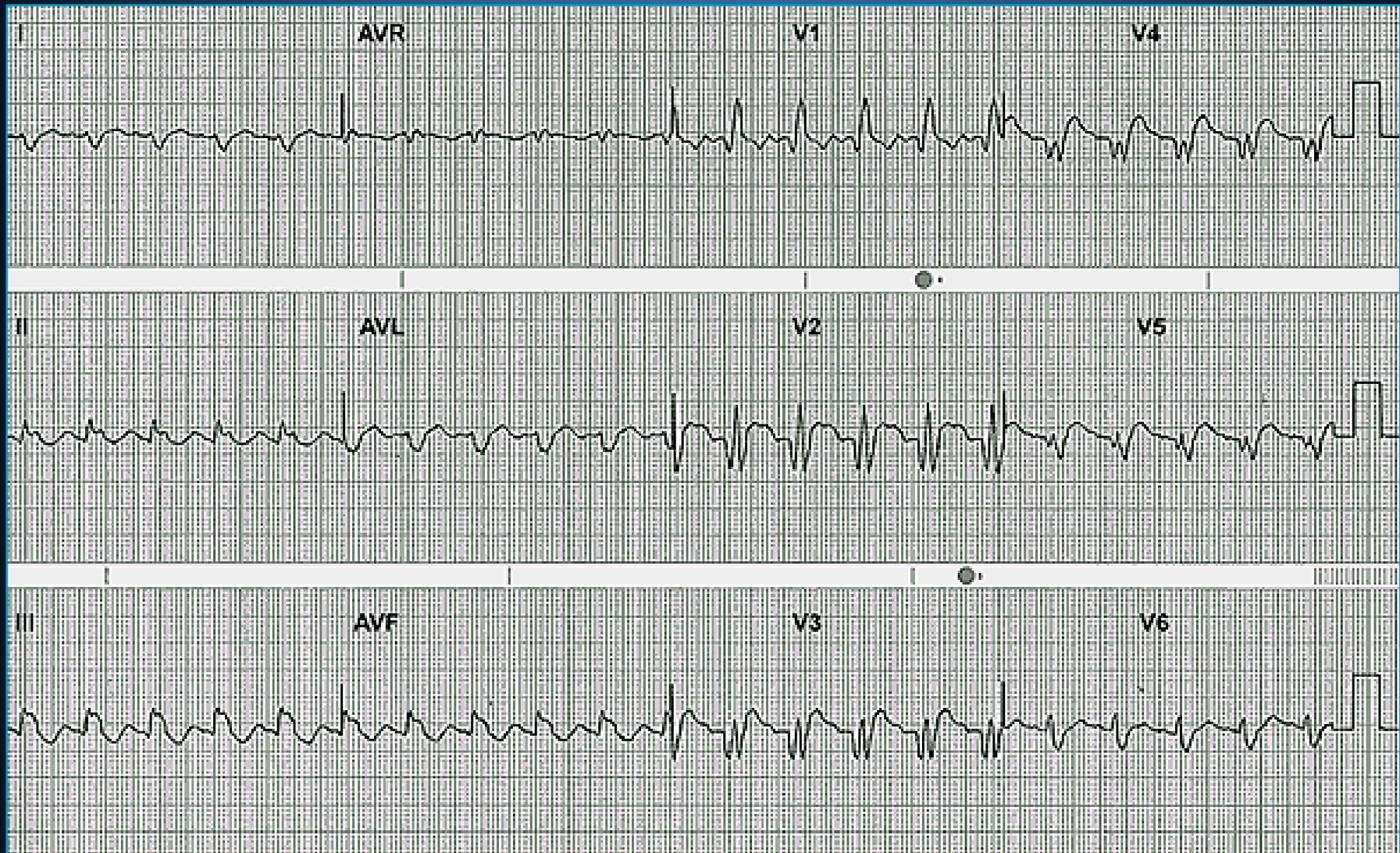




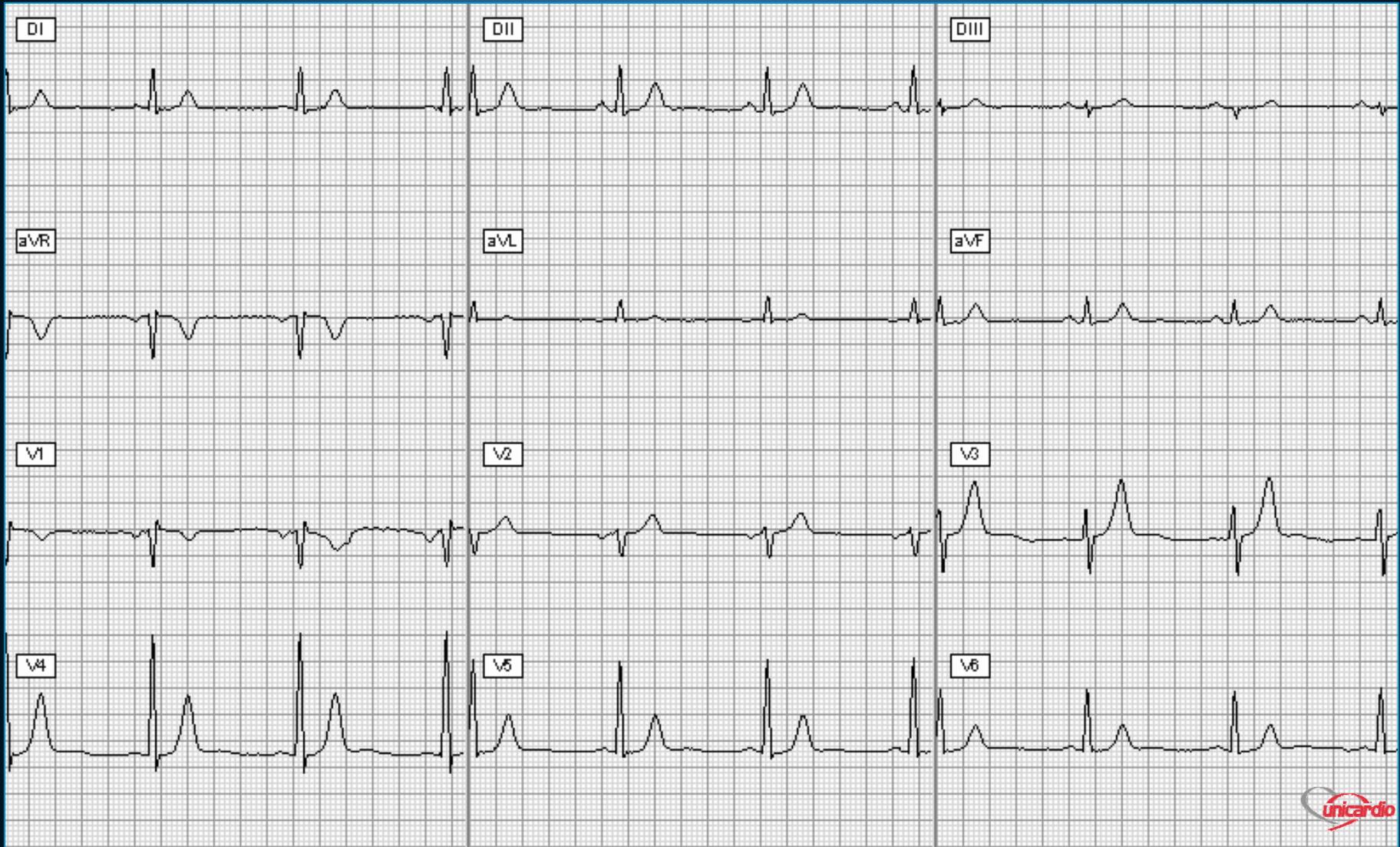
# Bloqueio do Ramo Direito



# BRD e IAM Ântero-septal



# BRD “Incompleto”

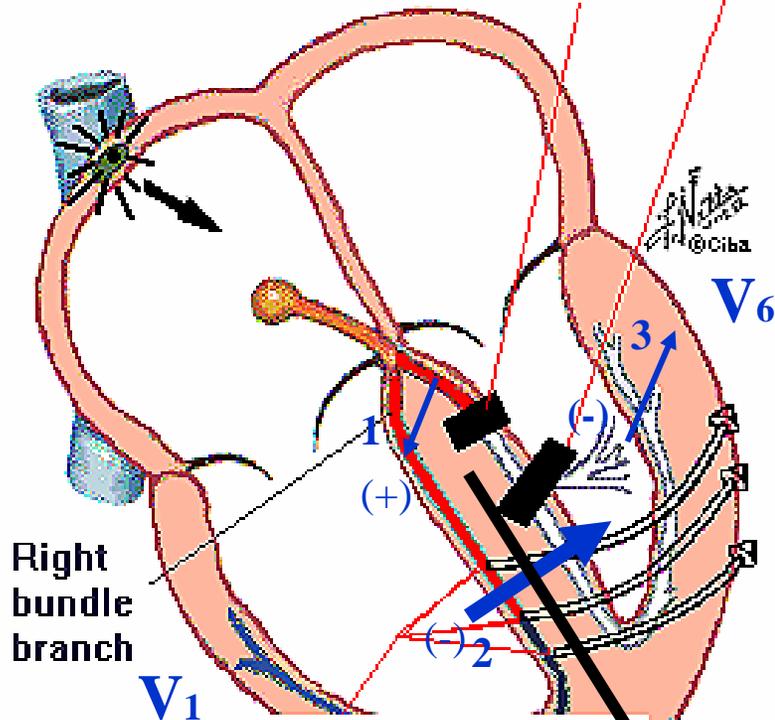


# Bloqueio do Ramo Esquerdo

Block of left anterior or posterior fascicles

OR

Block of left main bundle branch

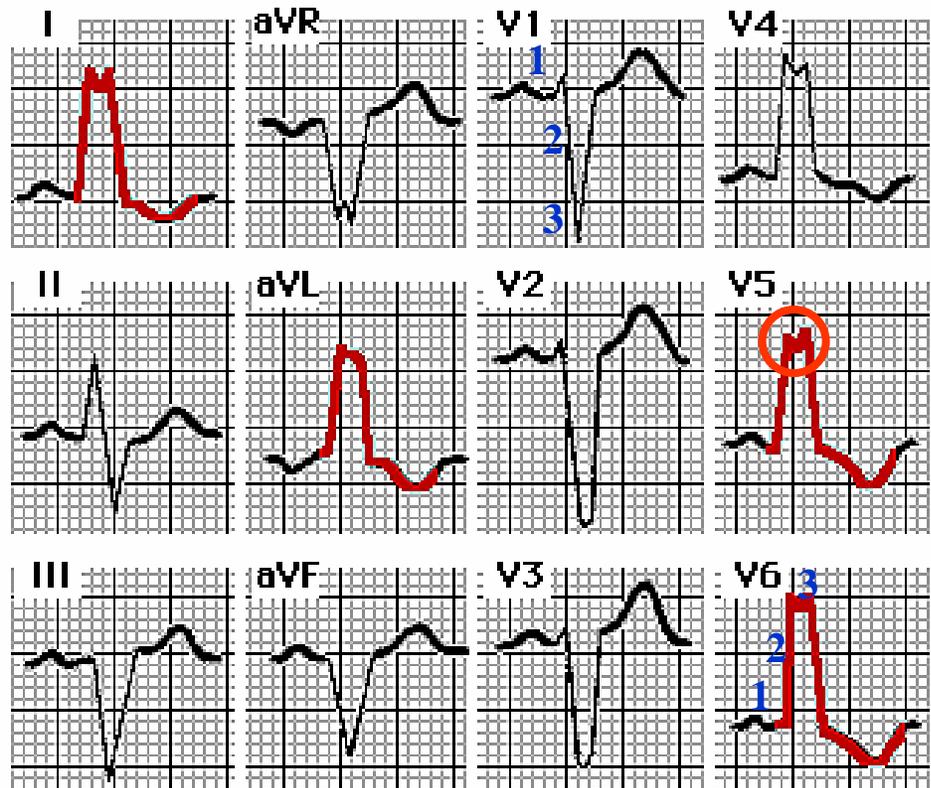


Right bundle branch

V<sub>1</sub>

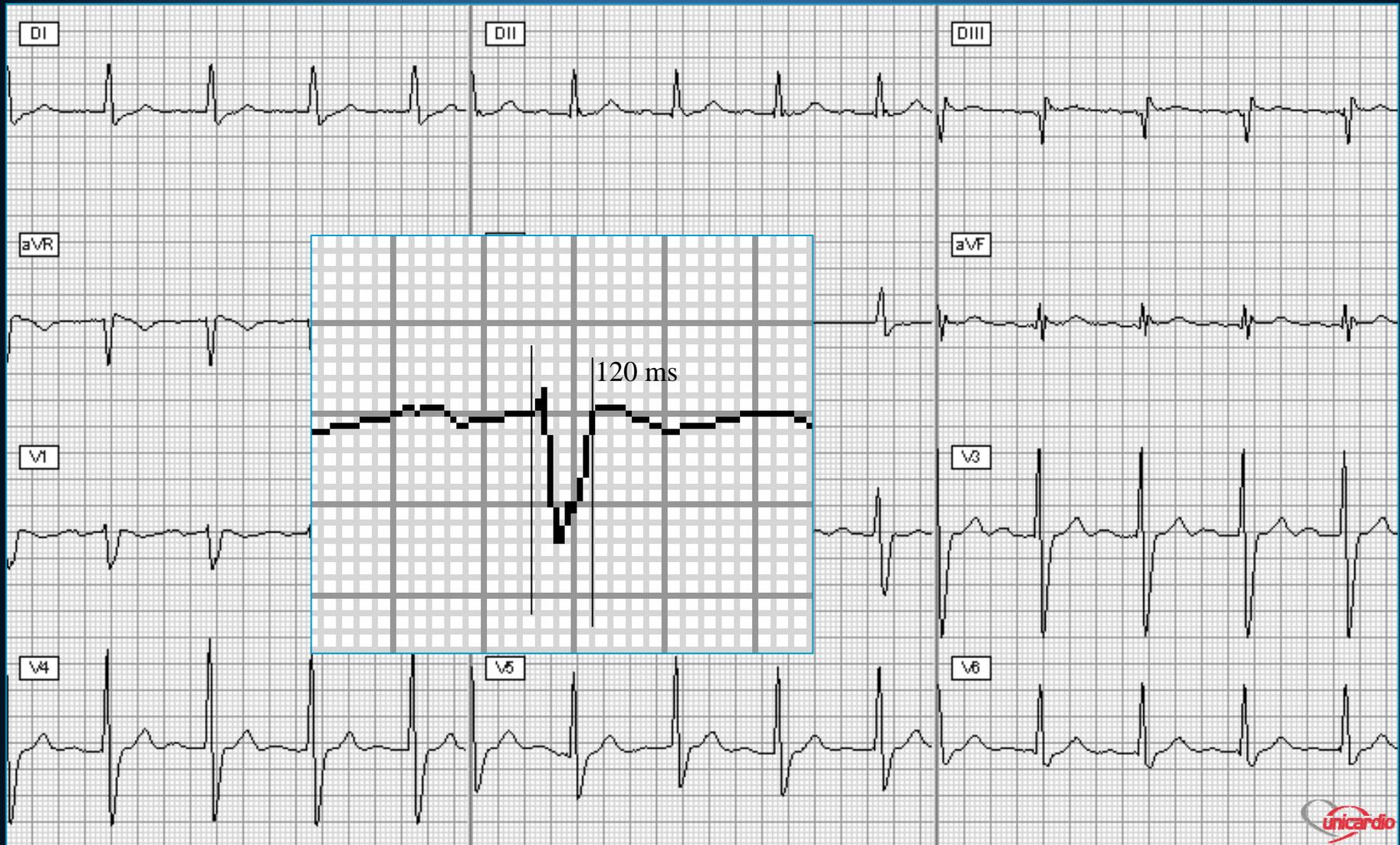
Electrical vector directed toward left ventricle as in normal, but delayed and prolonged

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

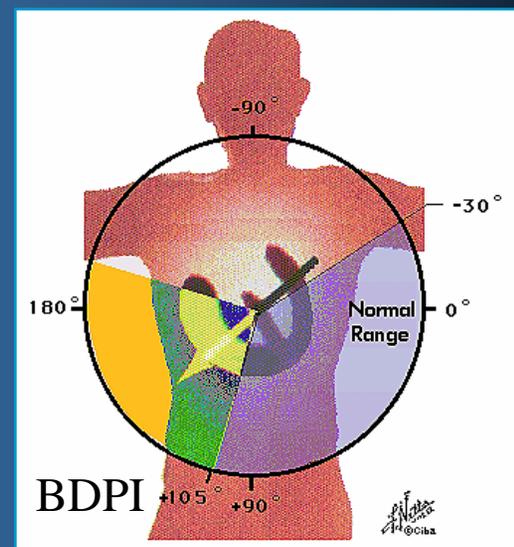
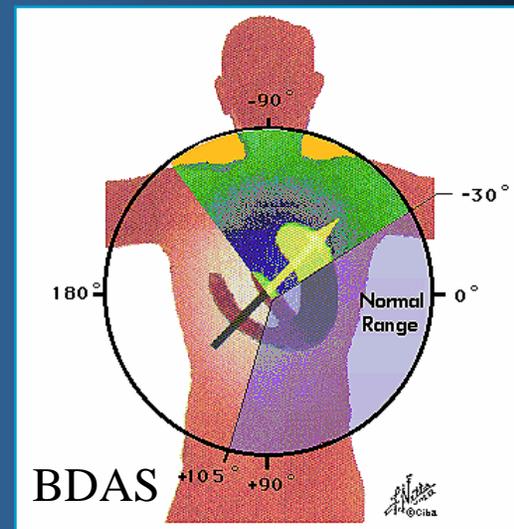
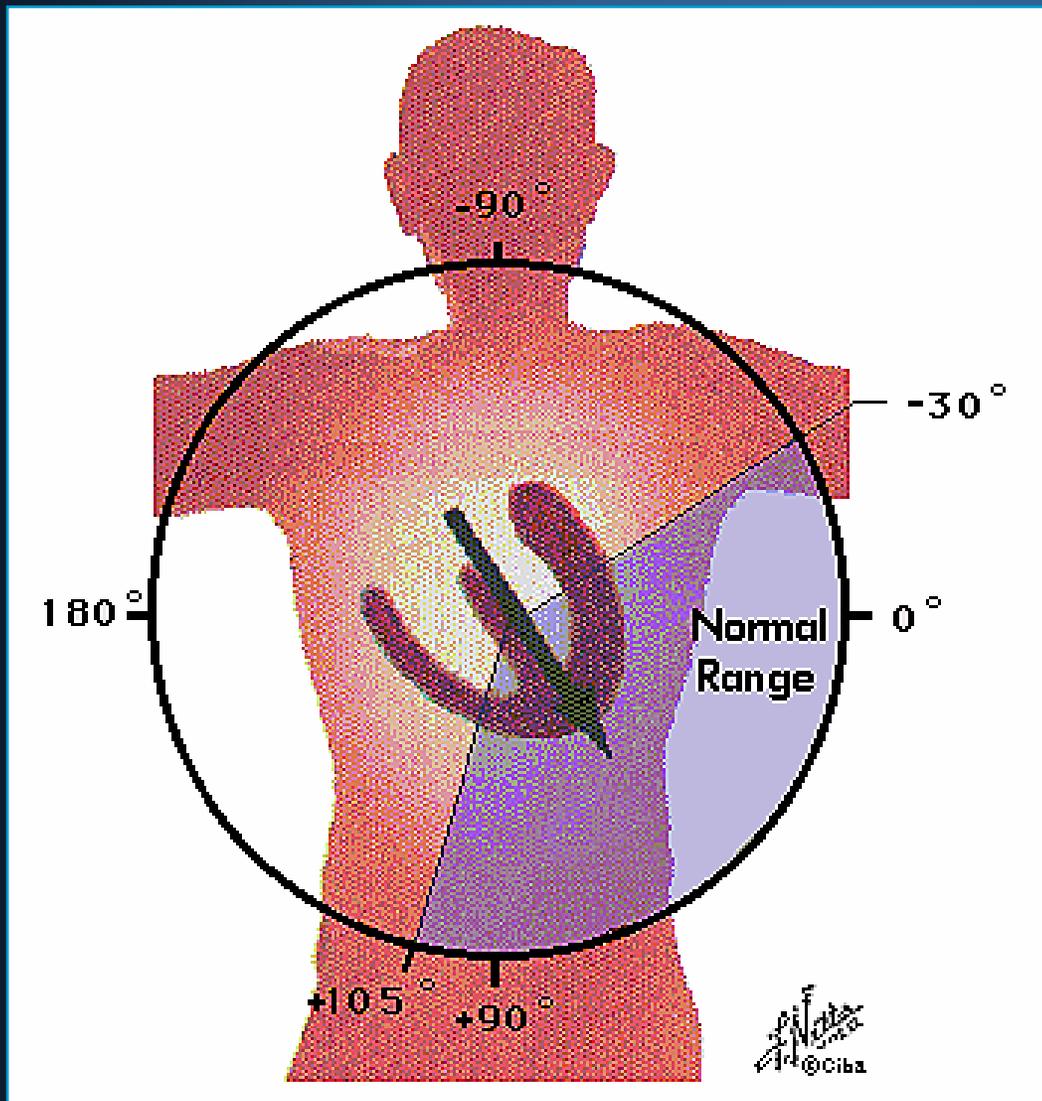




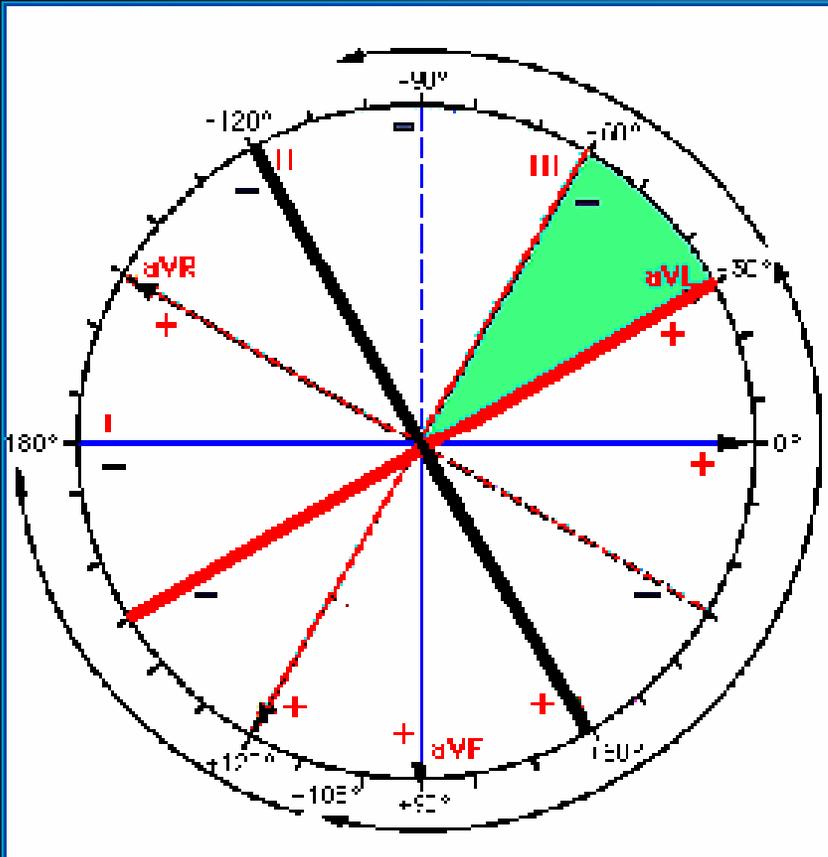
# Distúrbio de Condução Inespecífico



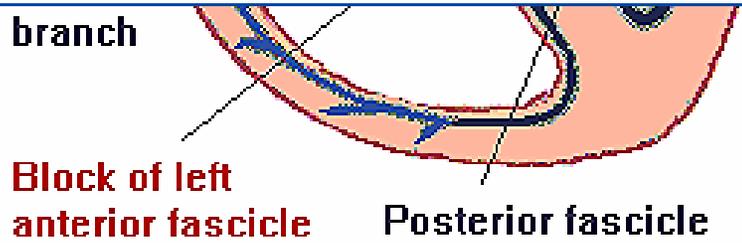
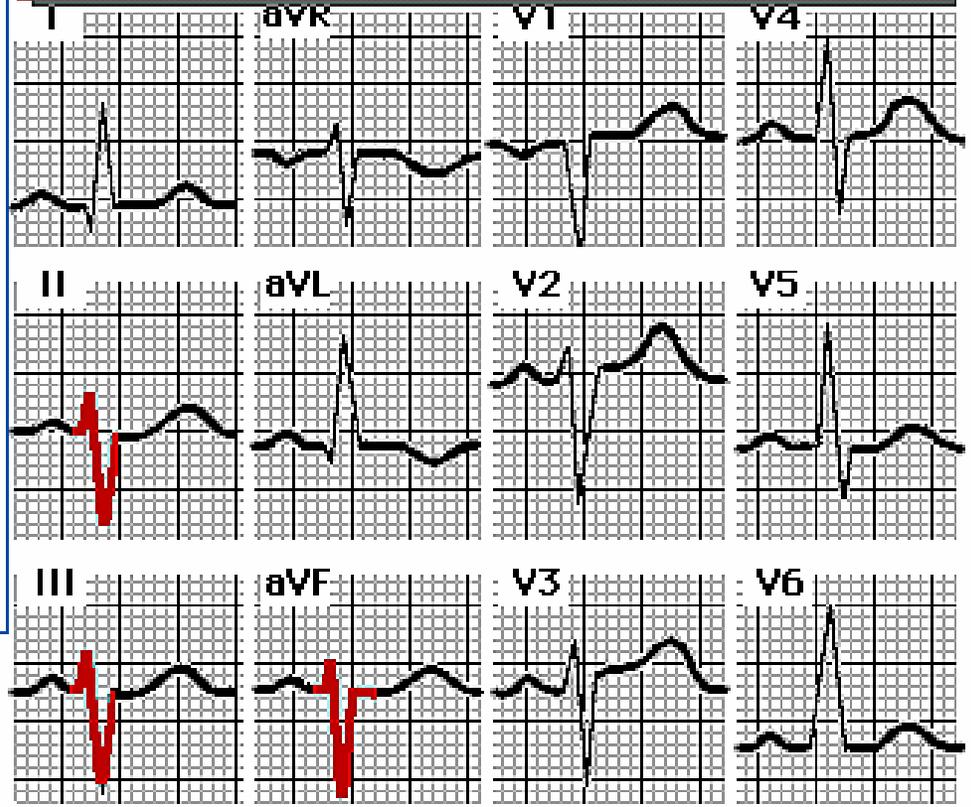
# Bloqueios Divisionais do Ramo Esquerdo



# BDAS do Ramo Esquerdo

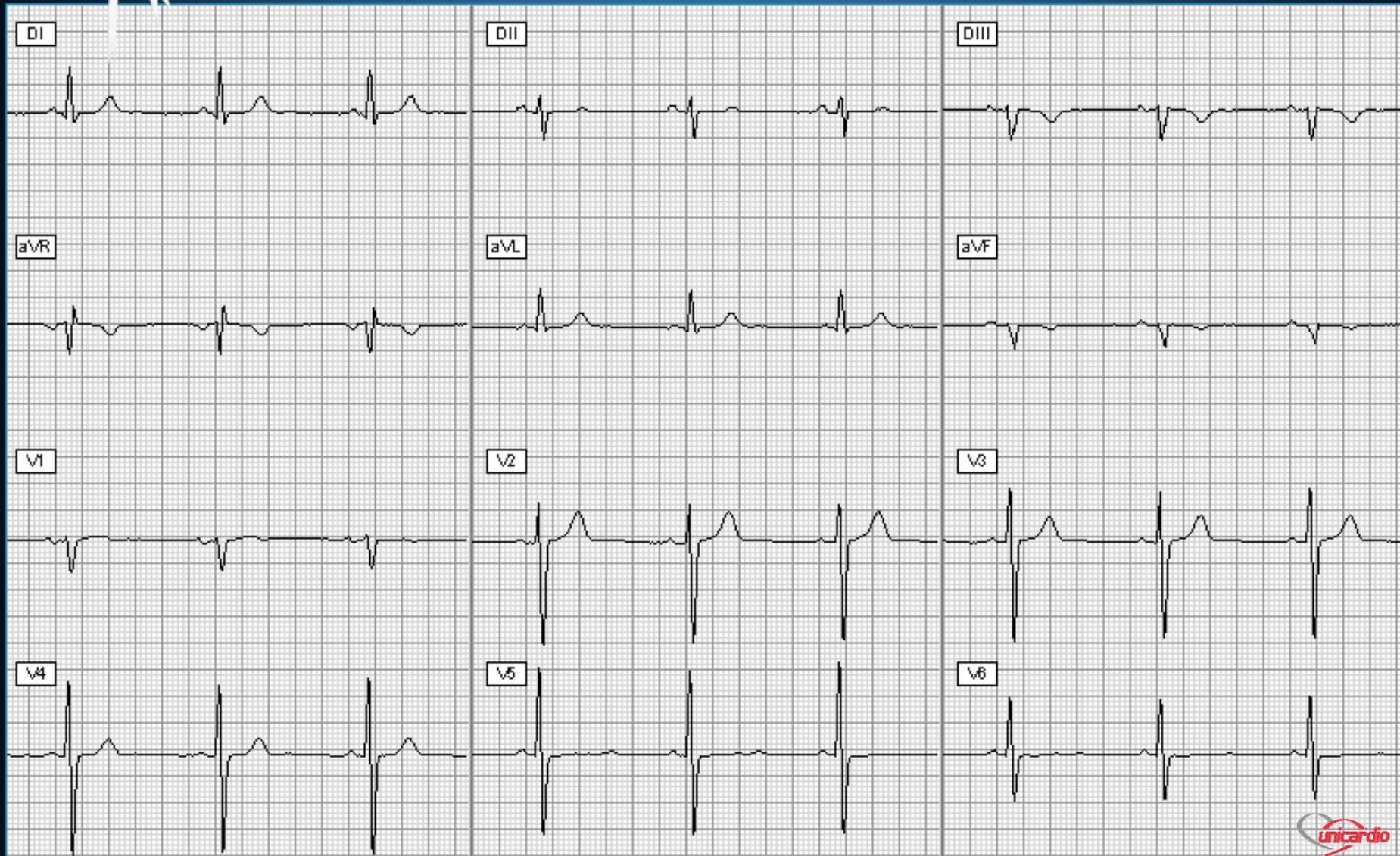


QRS complex of normal duration (<0.11 second in all leads)  
 S wave > R wave in leads II, III, and aVF  
 (marked left axis deviation)



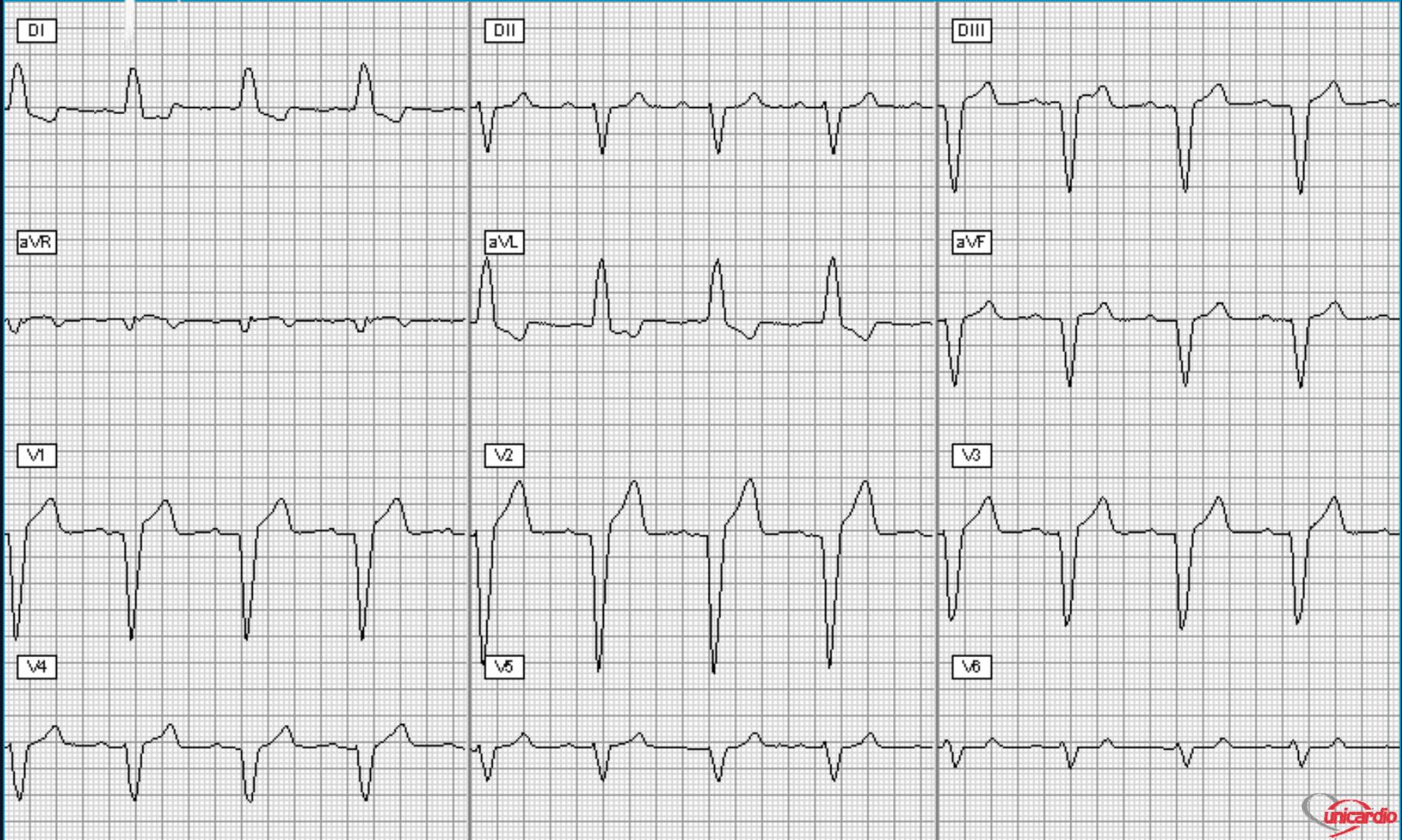


# BDAS do Ramo Esquerdo



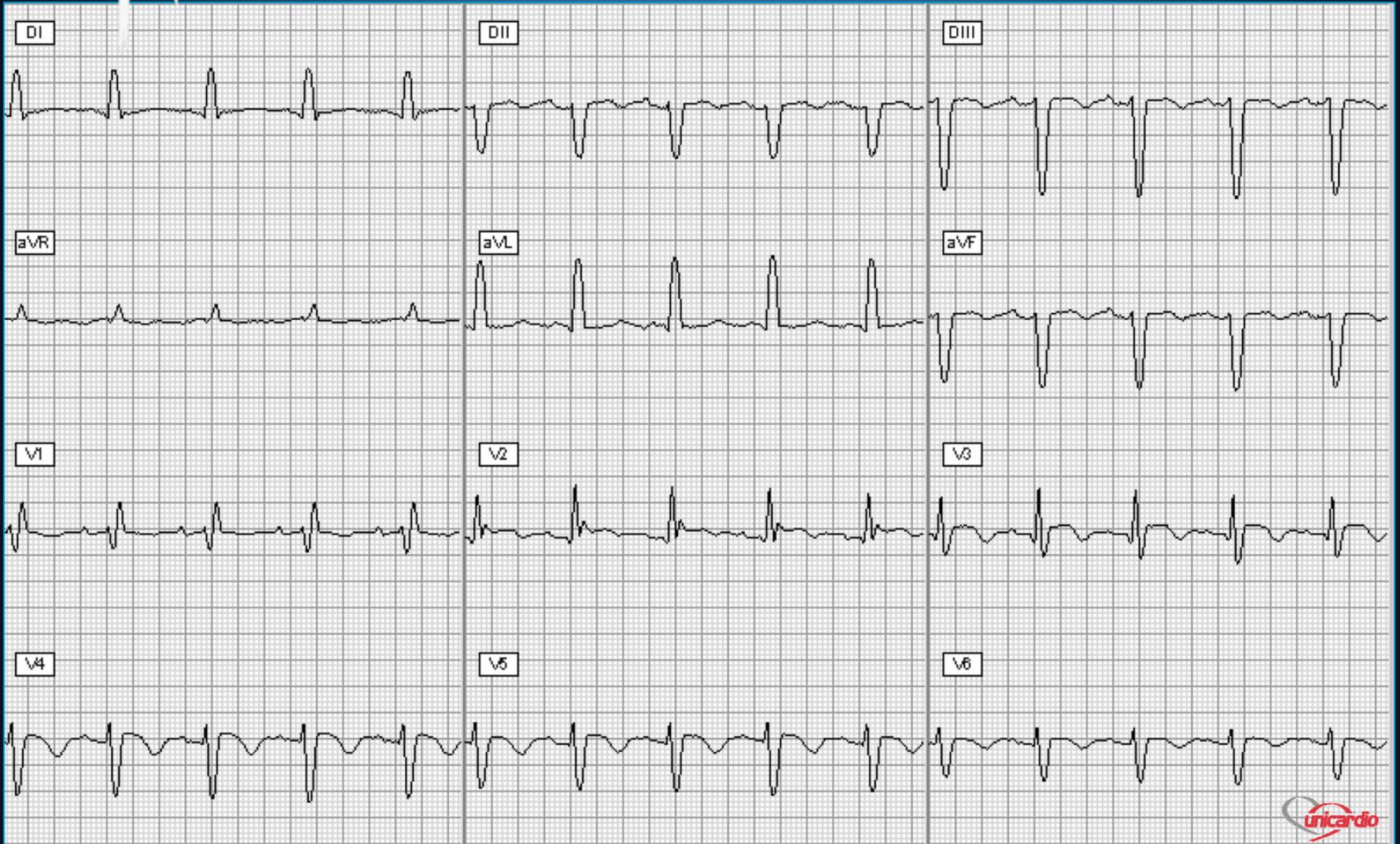


# Bifascicular: BRE + BDAS



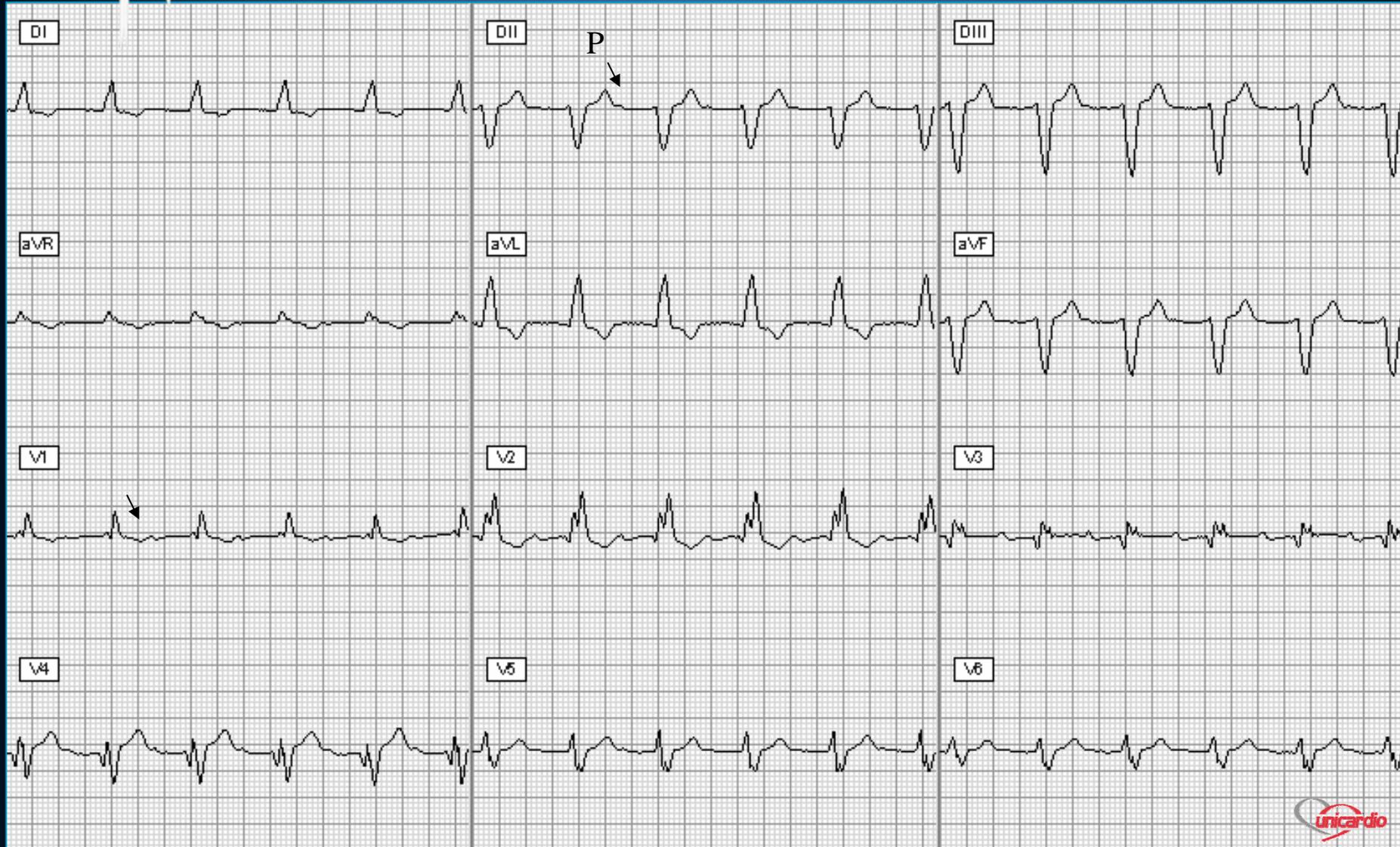


# Bifascicular: BRD + BDAS



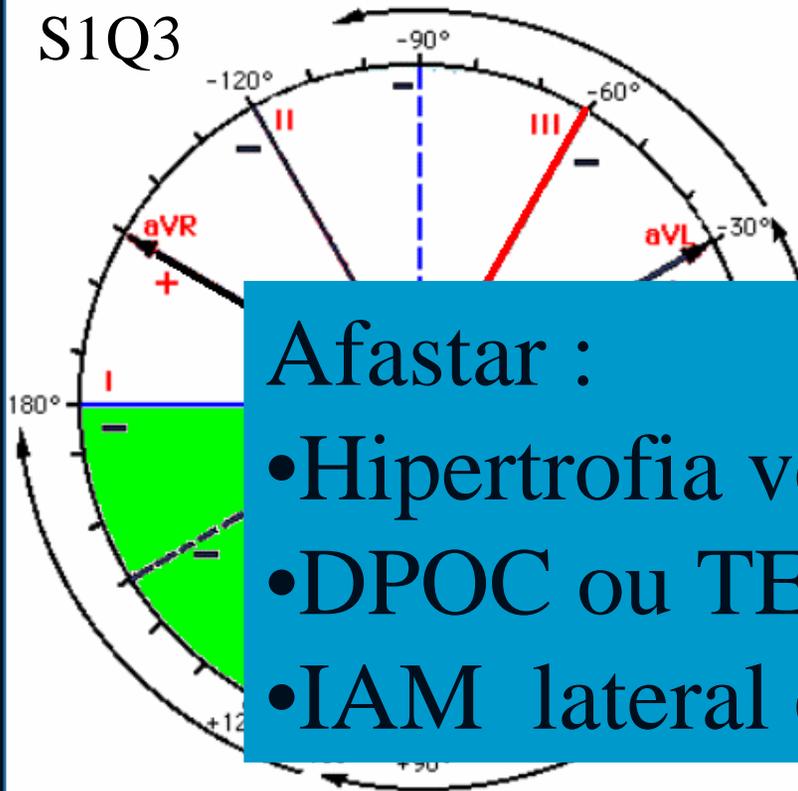


# BRD + BDAS + BAV 1° Grau



# BDPI do Ramo Esquerdo

S1Q3



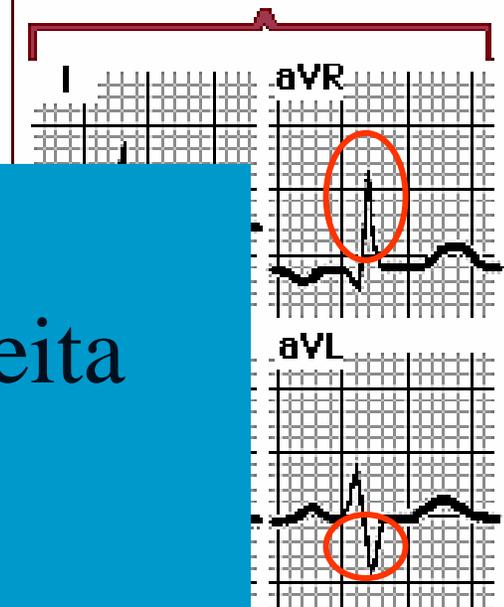
Afastar :

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

**BEFORE** posterior fascicular block



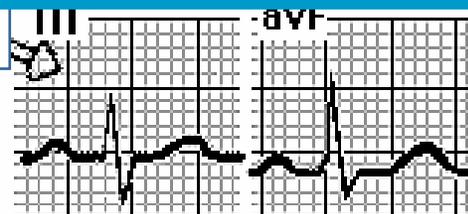
**AFTER** posterior fascicular block



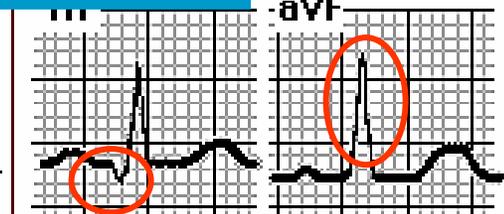
branch

Left anterior fascicle

Block of left posterior fascicle



QRS axis = +30 deg.



QRS axis = +75 deg.

# EEF nos bloqueios de ramo



## Classe I:

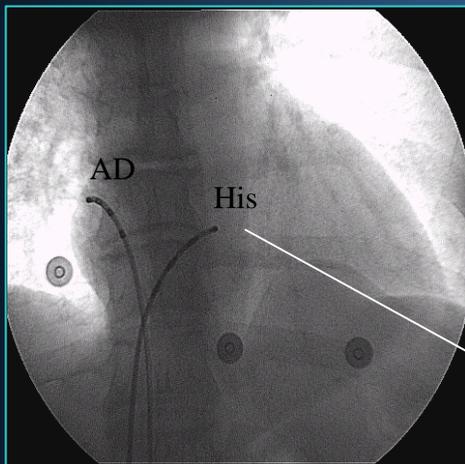
- Sintomáticos, com causa dos sintomas desconhecida (BAV intermitente? TVS?)

## 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



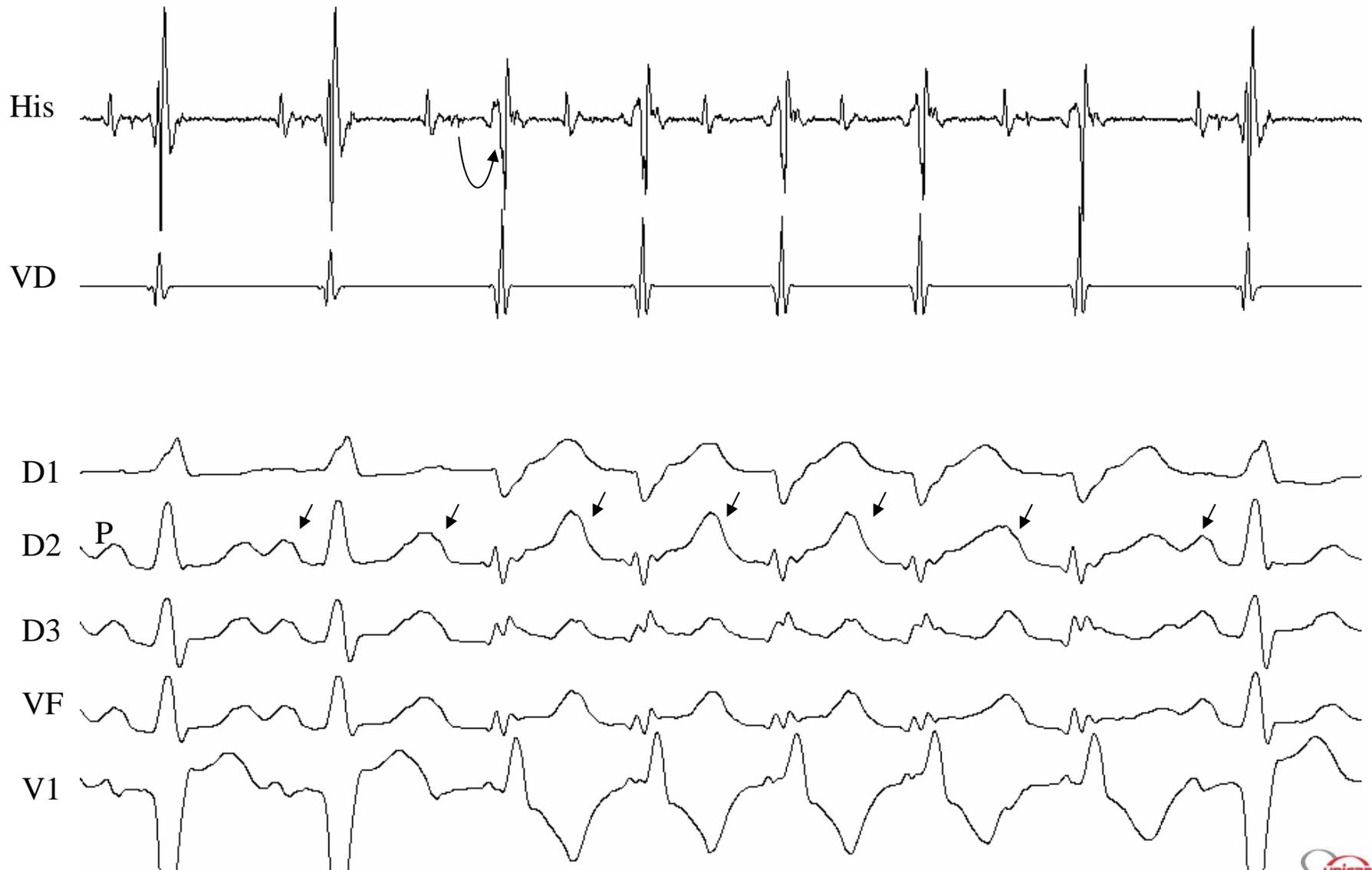
# EEF: Bloqueios de Ramo e Risco de Bloqueio AV



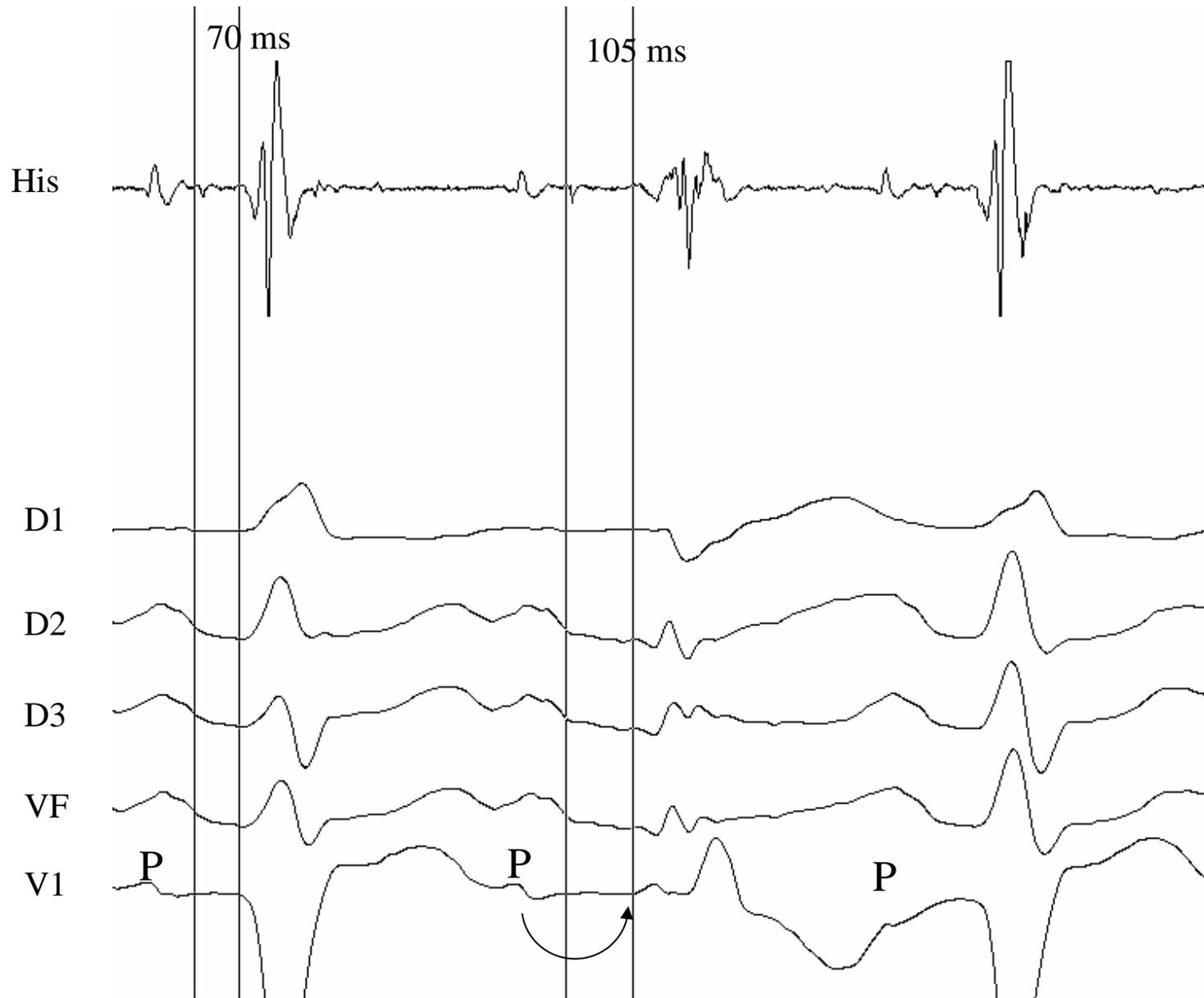
- PR isoladamente não é importante
- **BR alternante**: alto VPP, pouco sensível (> risco se batimento a batimento e com  $\Delta$  PR)
- **HV > 100 ms**: alto VPP, pouco sensível;  
    > 80 ms:  $\leq 6\%$  ao ano, não estratifica
- **BAV 2° MII ou 3°** com “pace” atrial < 150 ppm
- PRE-HP  $\geq 450$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

ES 156

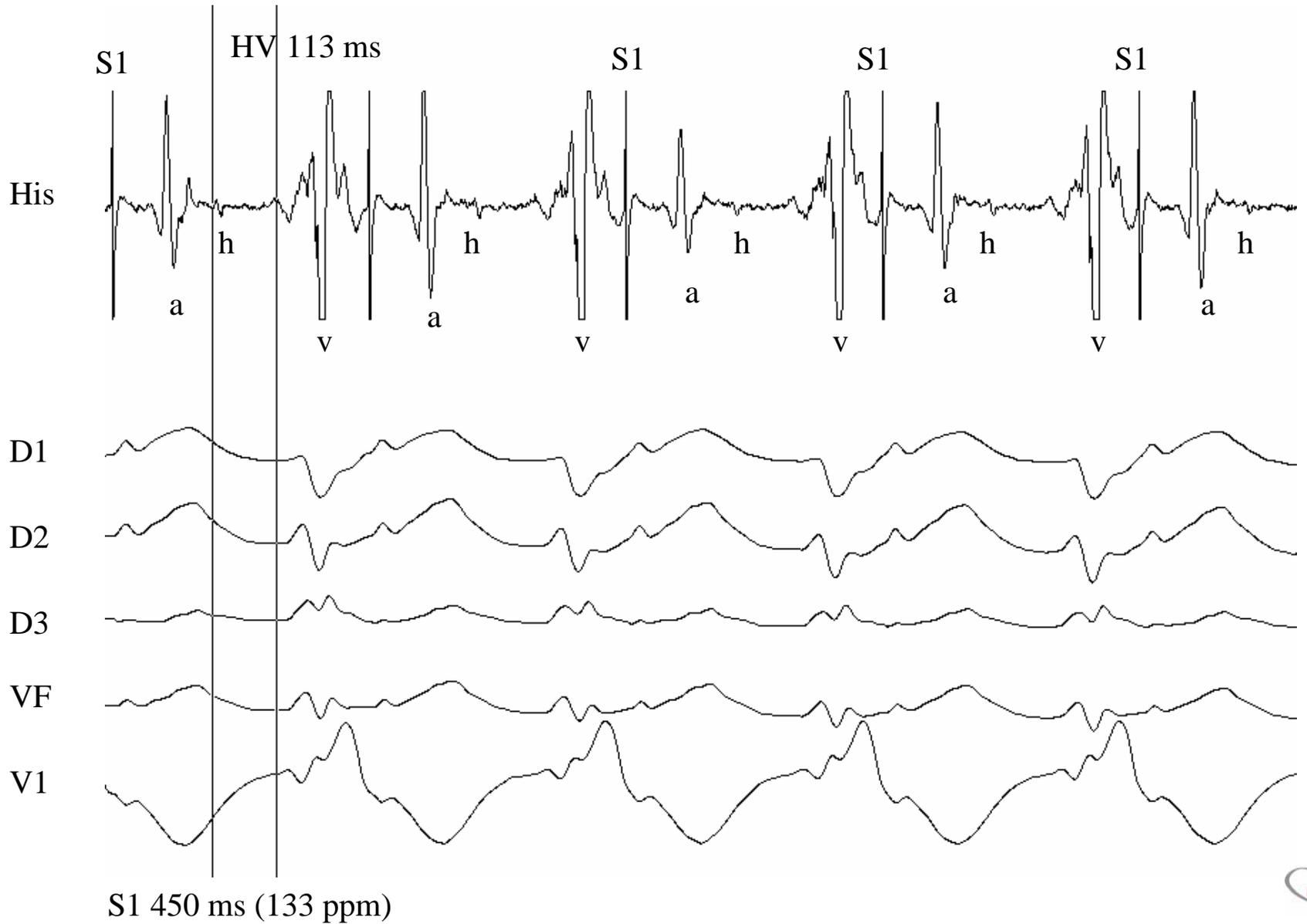
# Bloqueio de ramo alternante após procainamida



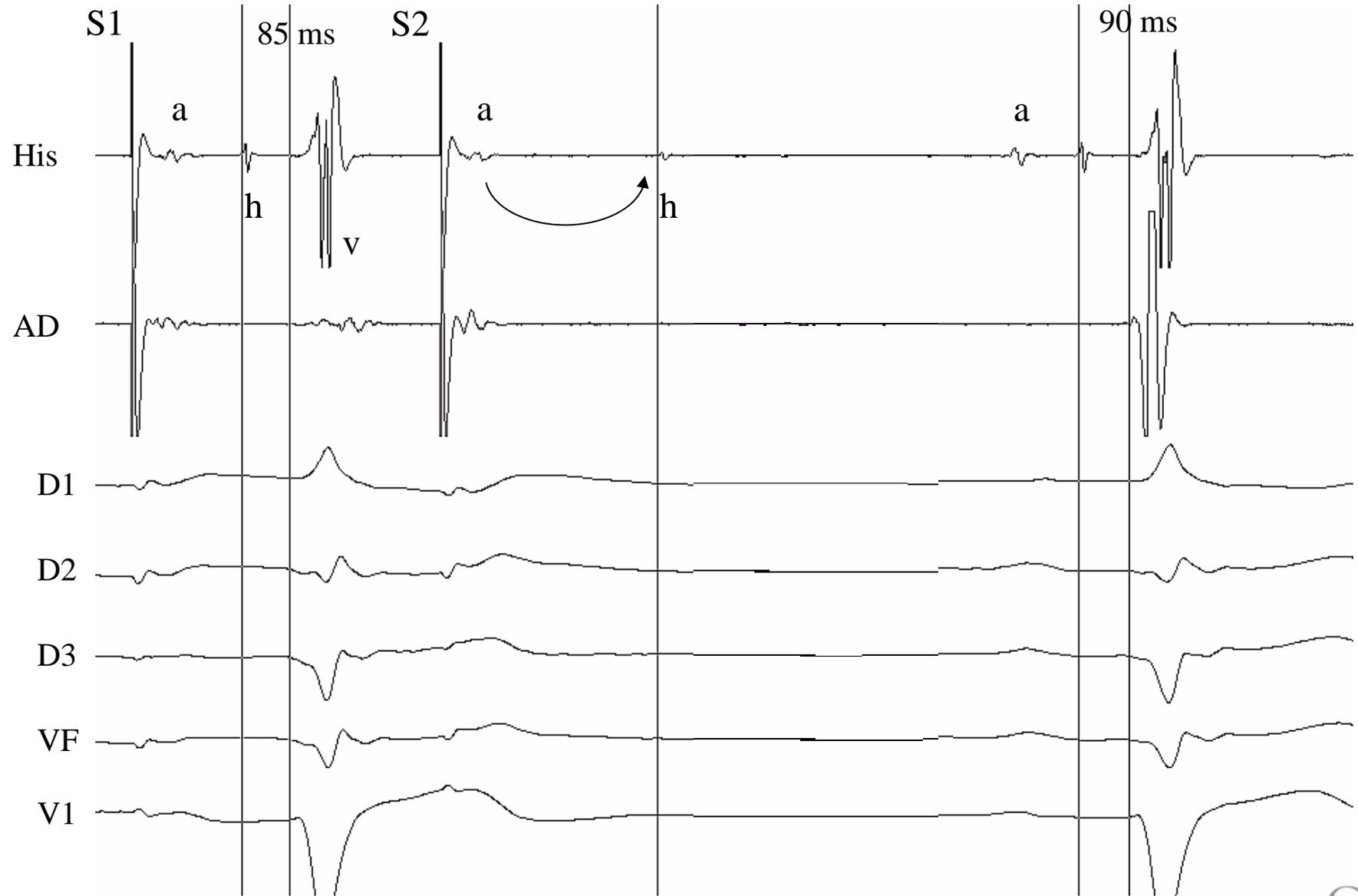
# ES 156 HV Após Procainamida (10 mg/Kg)



# ES 156 Estimulação do AD após procainamida



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



# Bloqueio de Ramo e Marcapasso



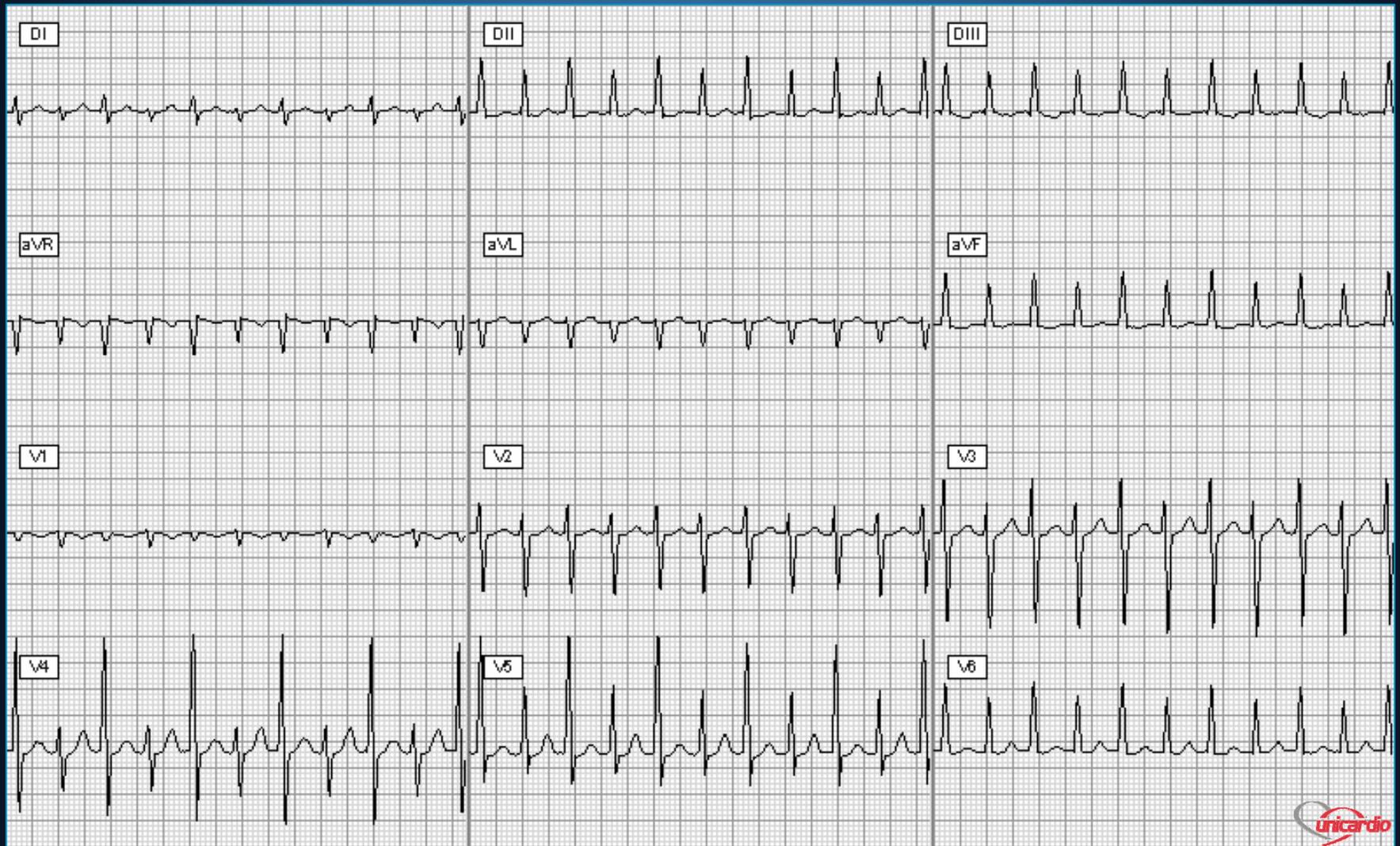
	HV < 55	HV 60-99	HV > 100 ms
BRE, BRD, DCIV	Não*	Sim, c/sintomas †	Sim†
BRE+BDAS ou BDPI	Não*	Sim, c/sintomas †	Sim†
BR Alternante	†	Sim	Sim
Bloqueio após o His > 150 bpm	Não*	Sim, c/sintomas ‡	Sim

\* Salvo síncope recorrente documentada sem outras causas

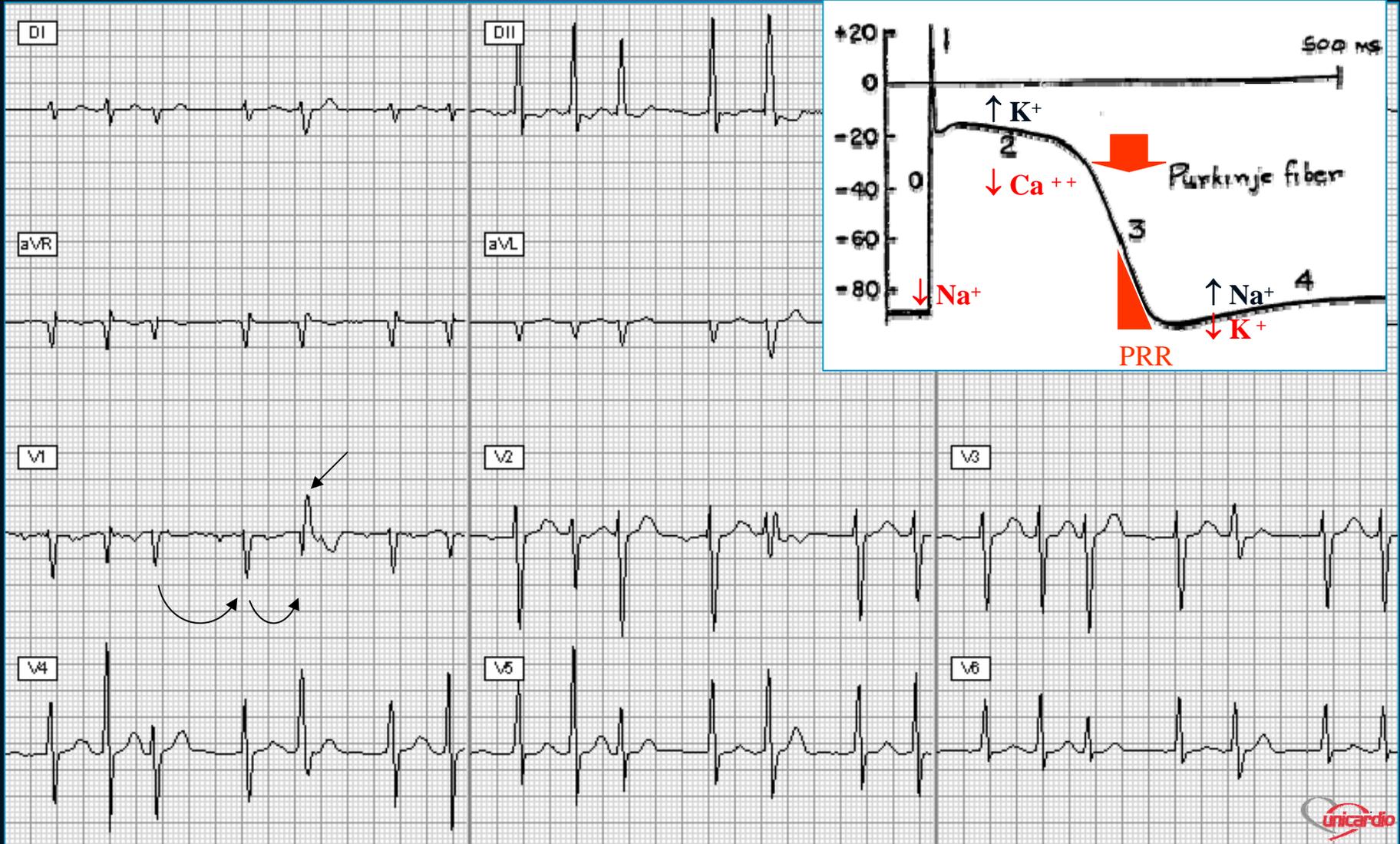
† Síncope ou Pré-síncope, excluídas causas não cardíacas e não taquicárdicas

‡ Raramente ocorre

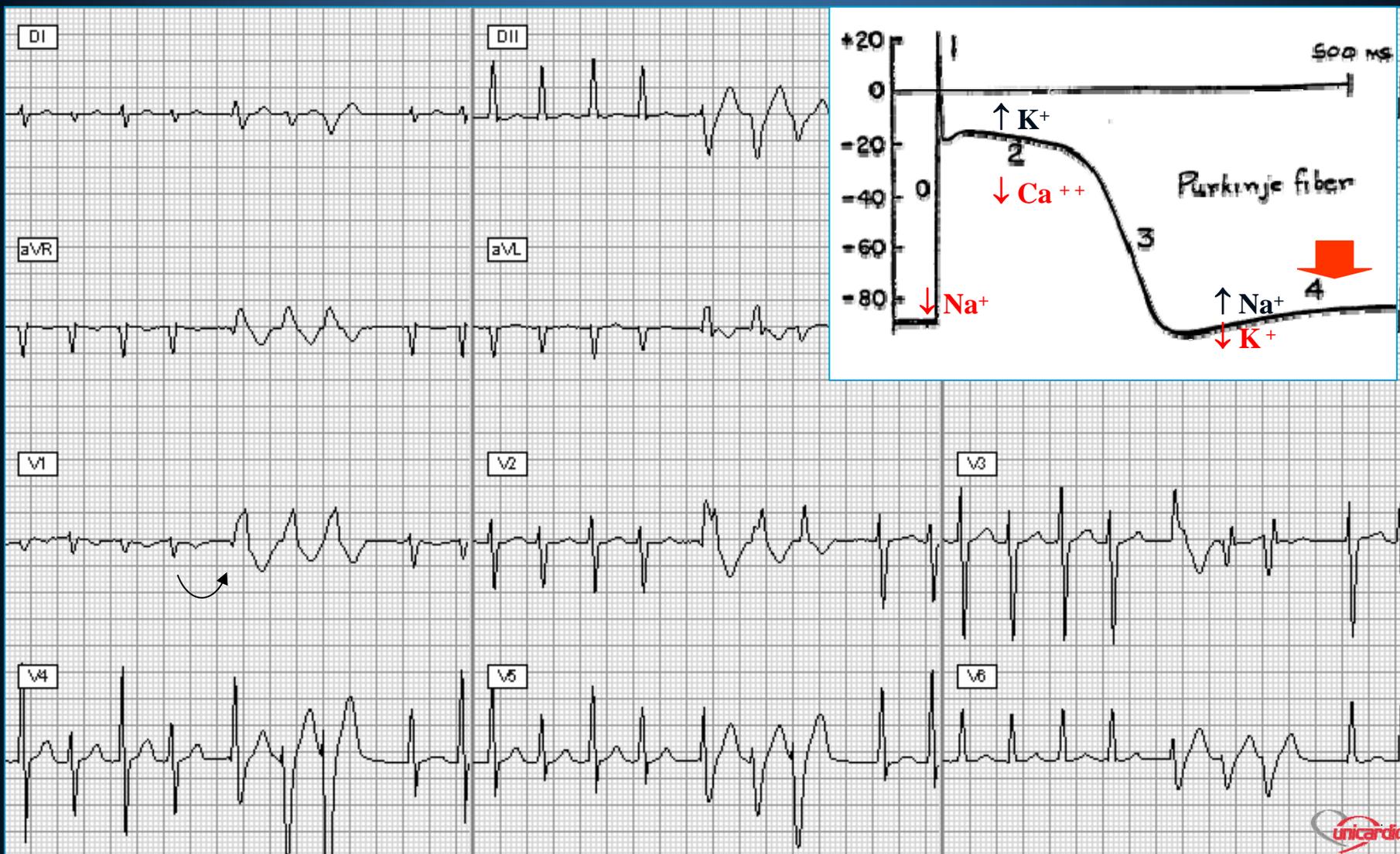
# Taquicardia Atrial: Alternância Elétrica



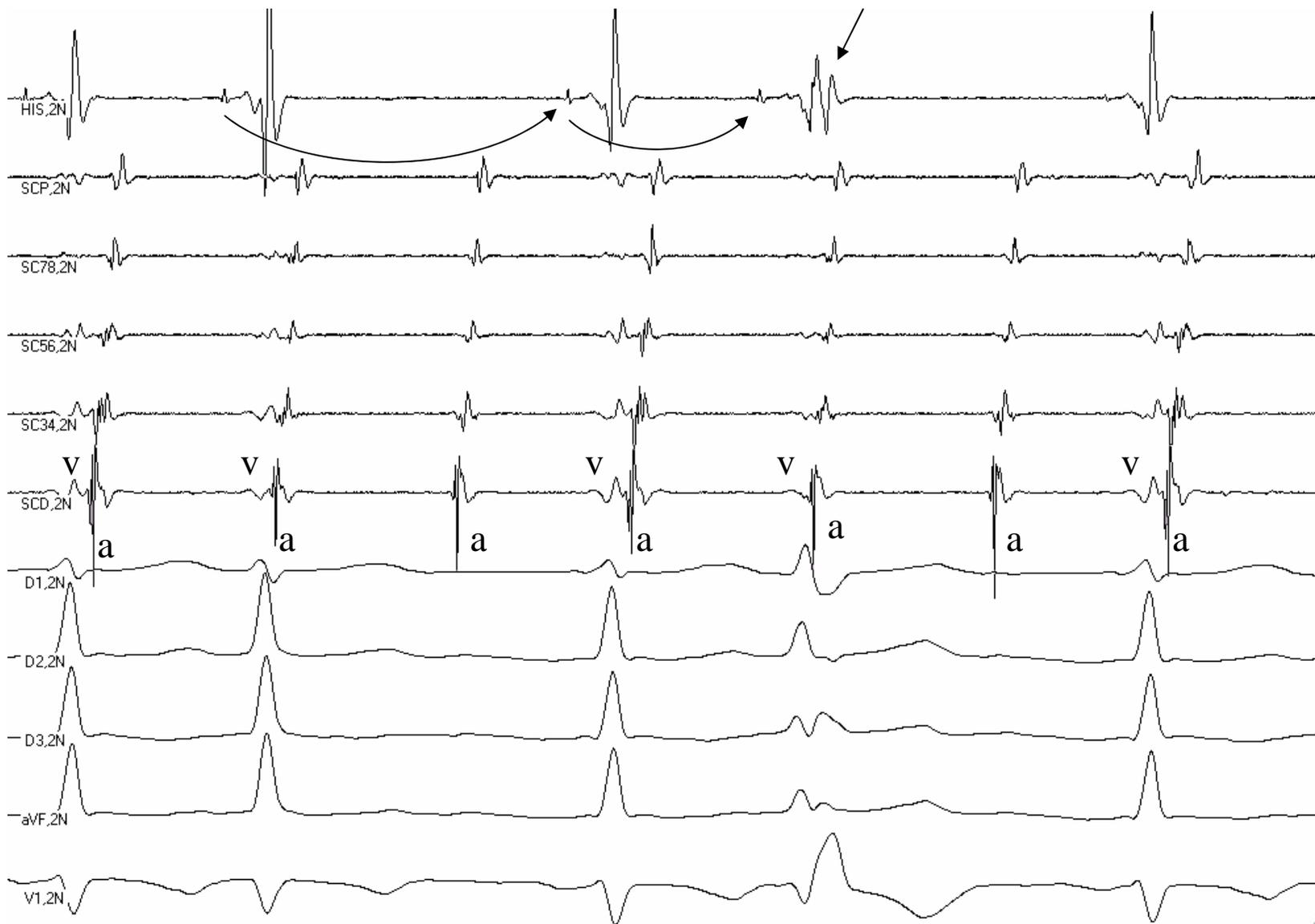
# TA e Aberrância: Bloqueio de Fase 3



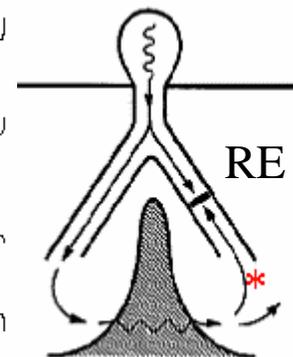
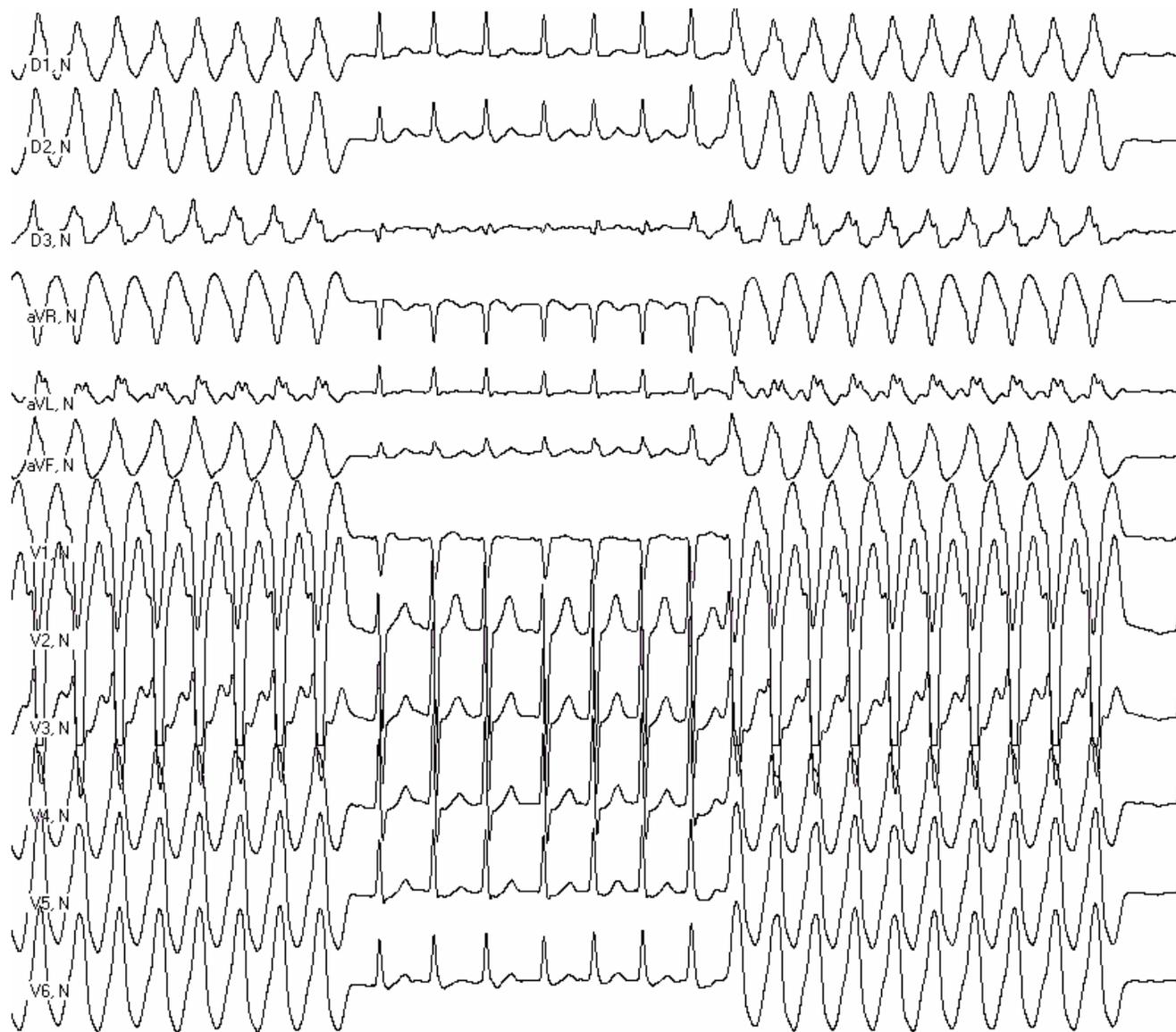
# Aberrância: Bloqueio de Fase 4



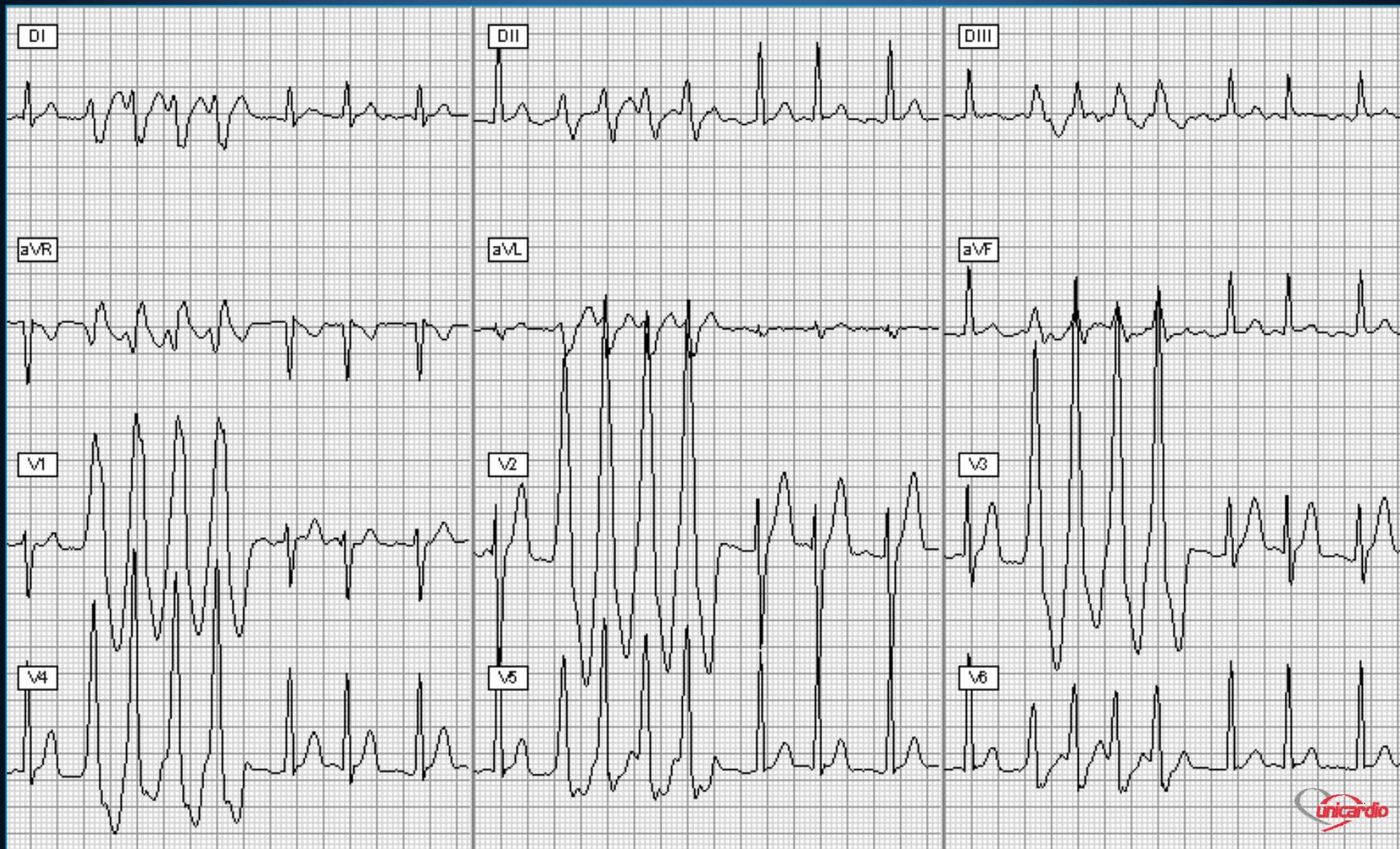
# Taquicardia Atrial e Bloqueio de Fase 3



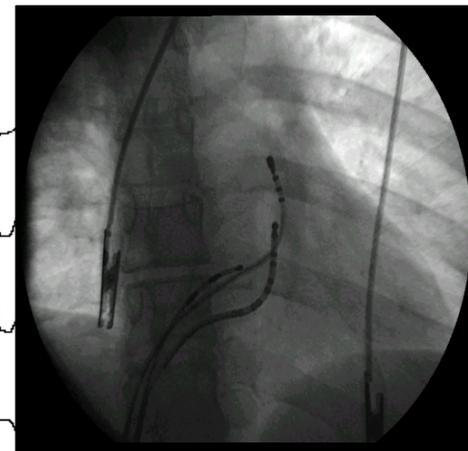
# Fibrilação Atrial e Fenômeno de Ashman



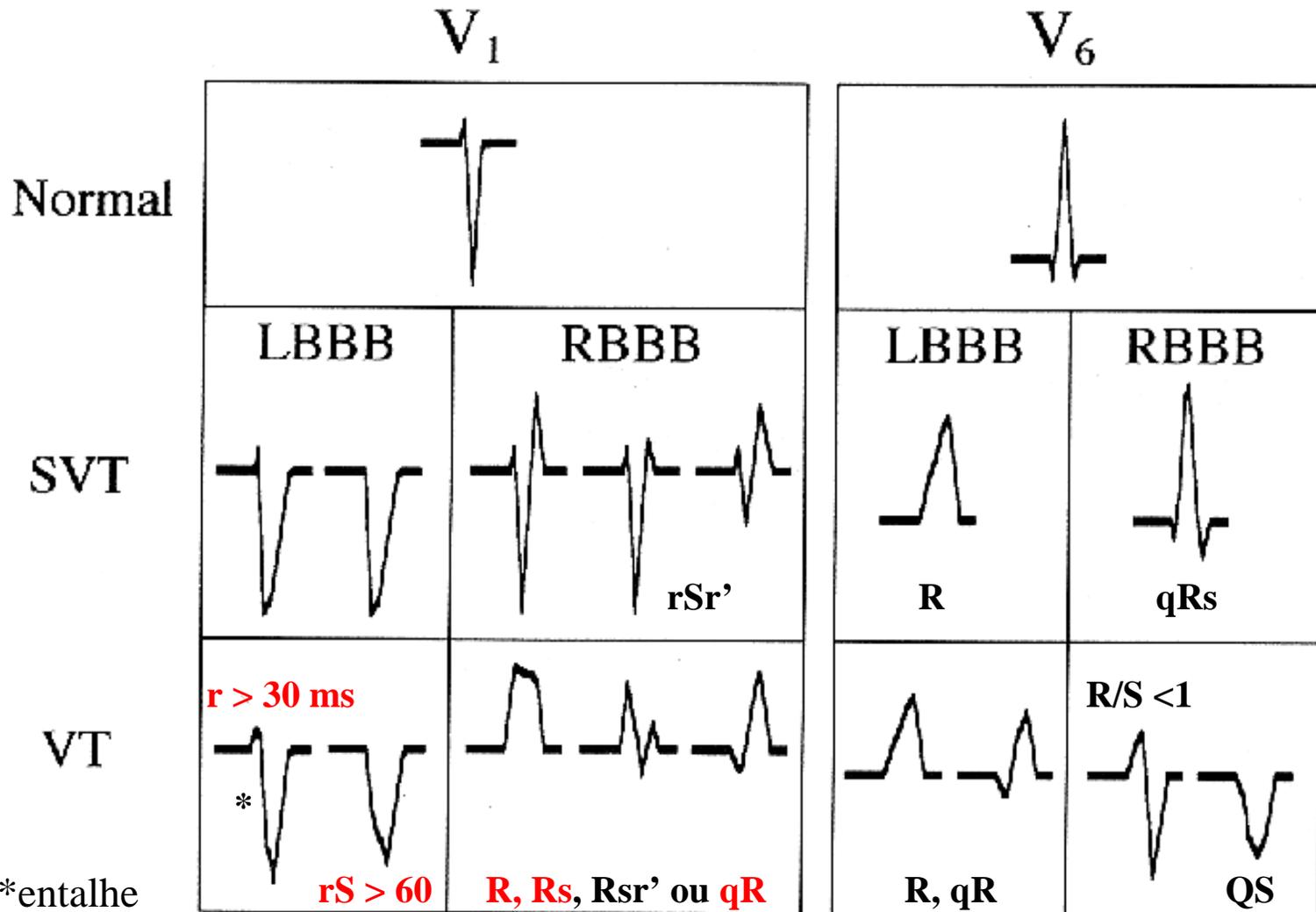
# FA e WPW Lateral Esquerdo



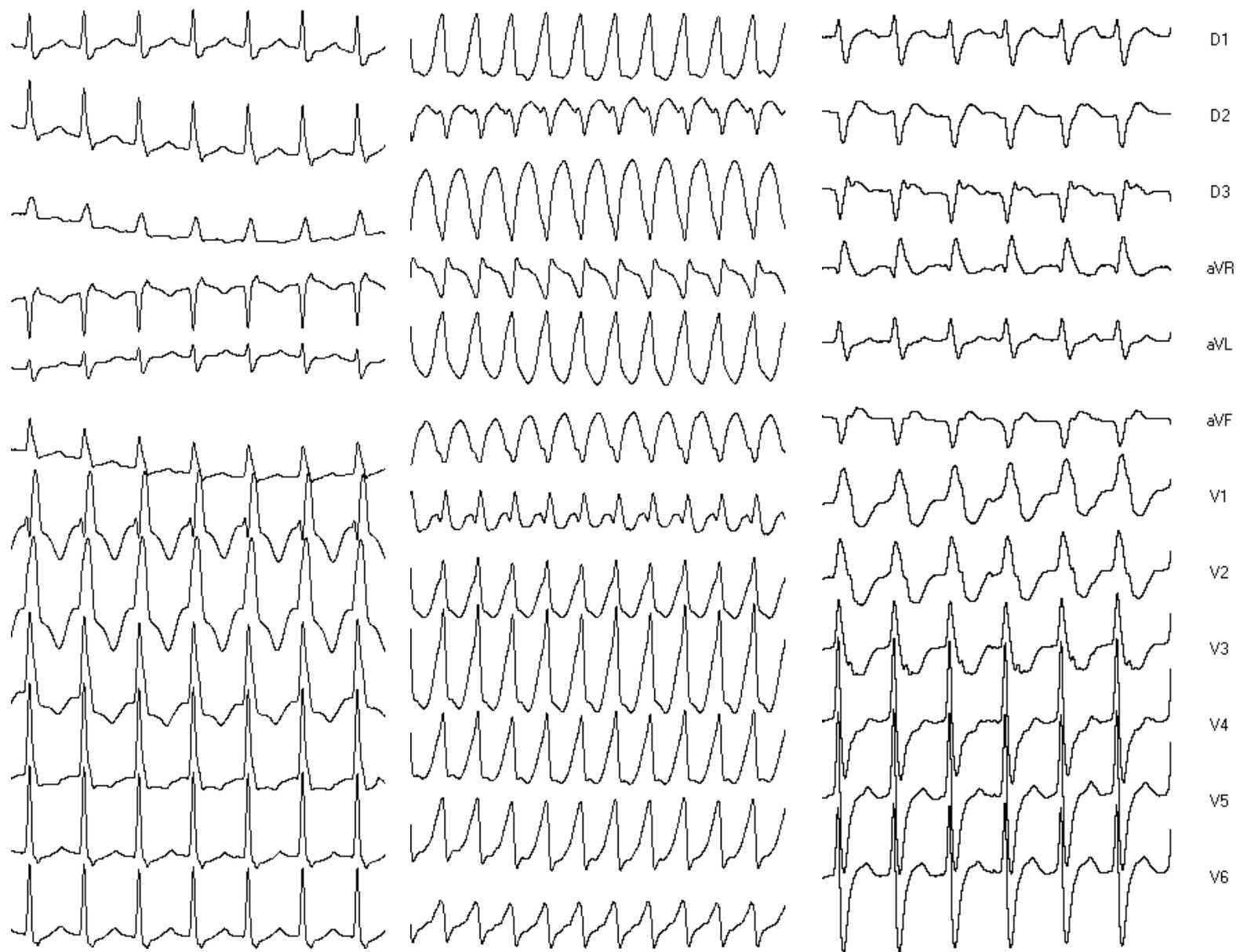
# FA e TVNS da Via de Saída do VD



# TVS: Critérios Morfológicos



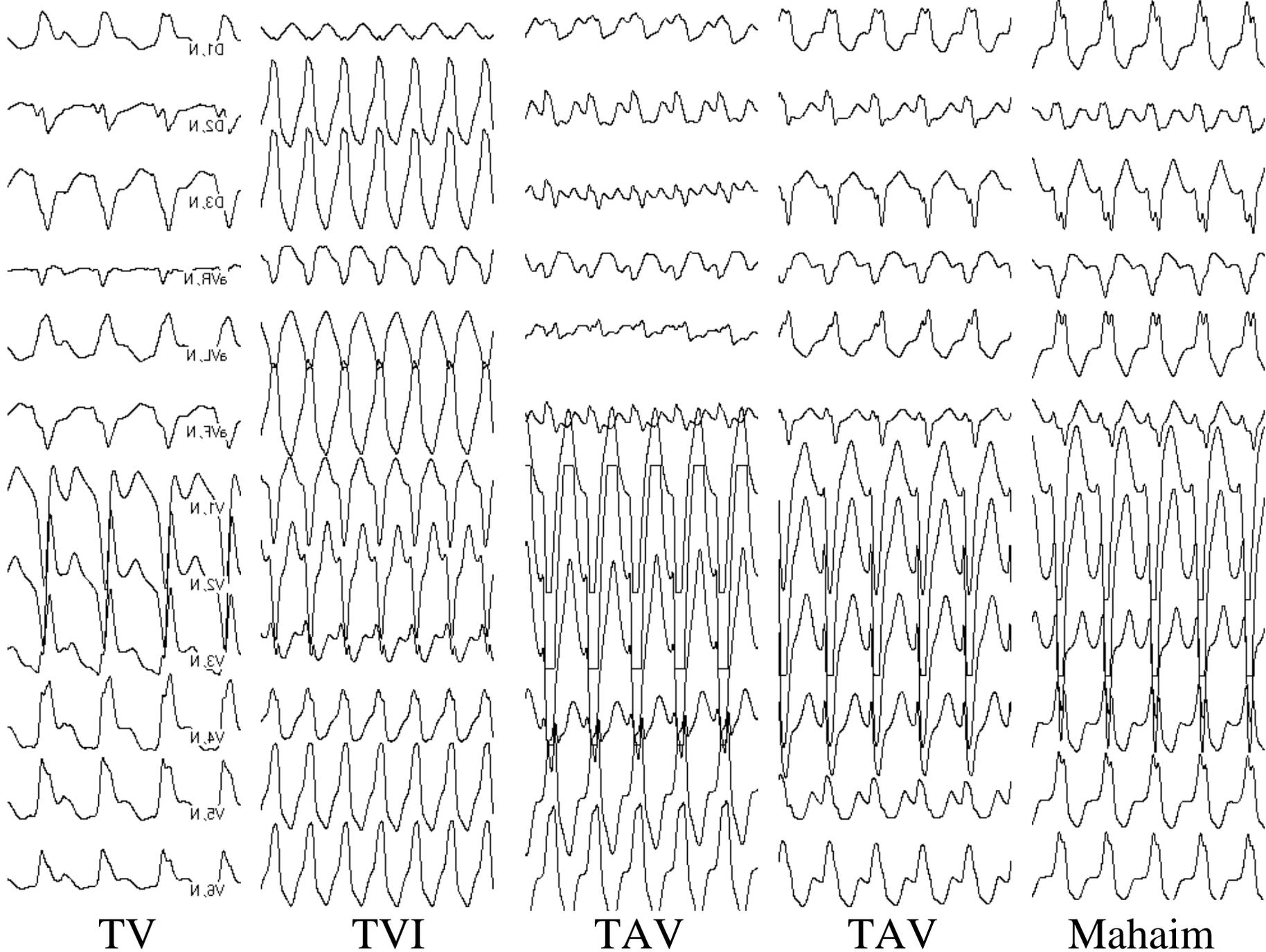
\*entalhe



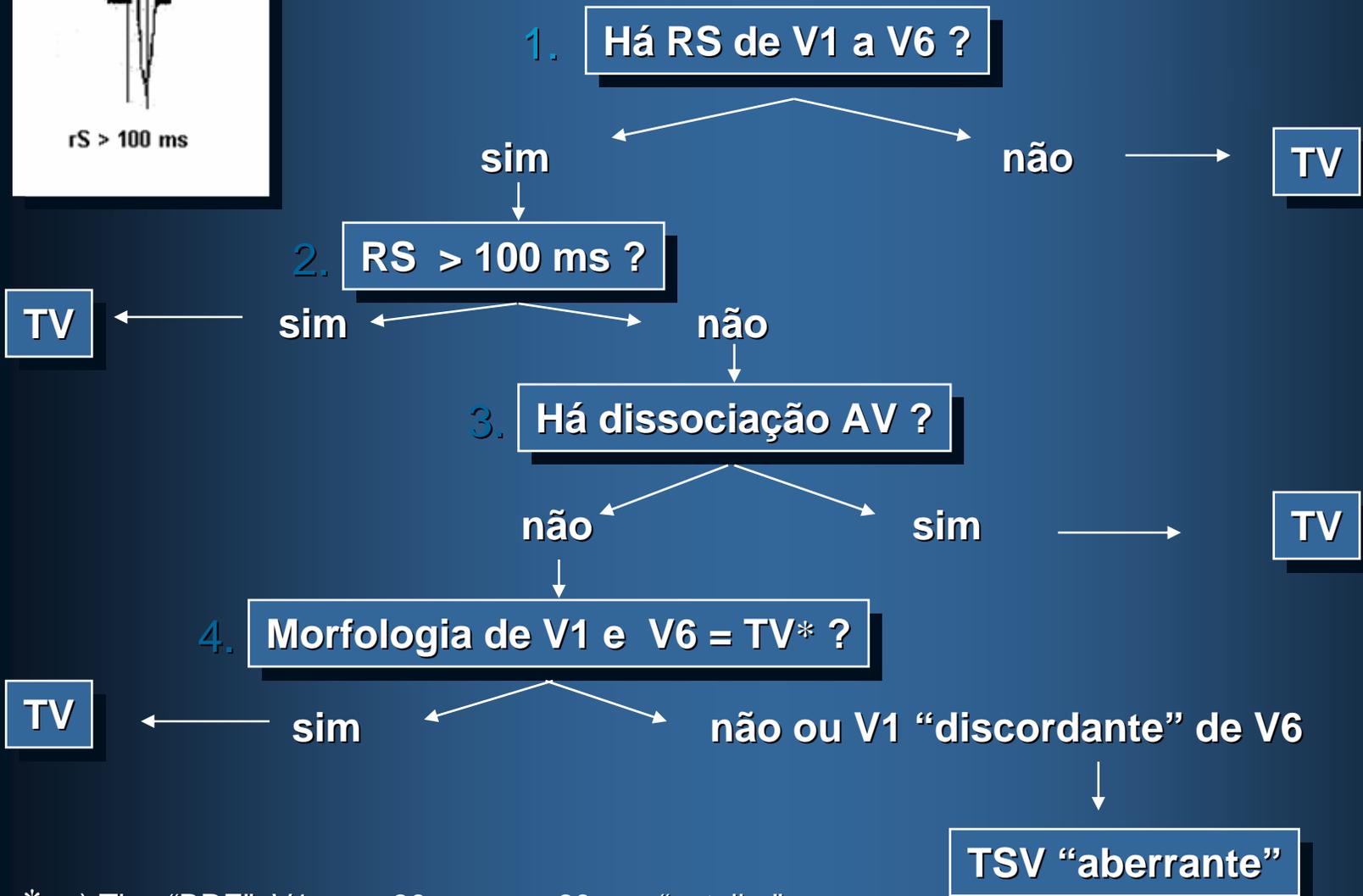
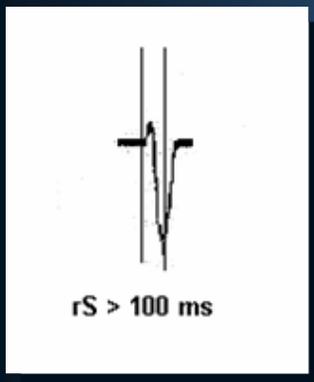
TRN

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