ECG normal et pathologique… Troubles du rythme, de la conduction et de la repolarisation

Patrick ECOLLAN / François LECOMTE

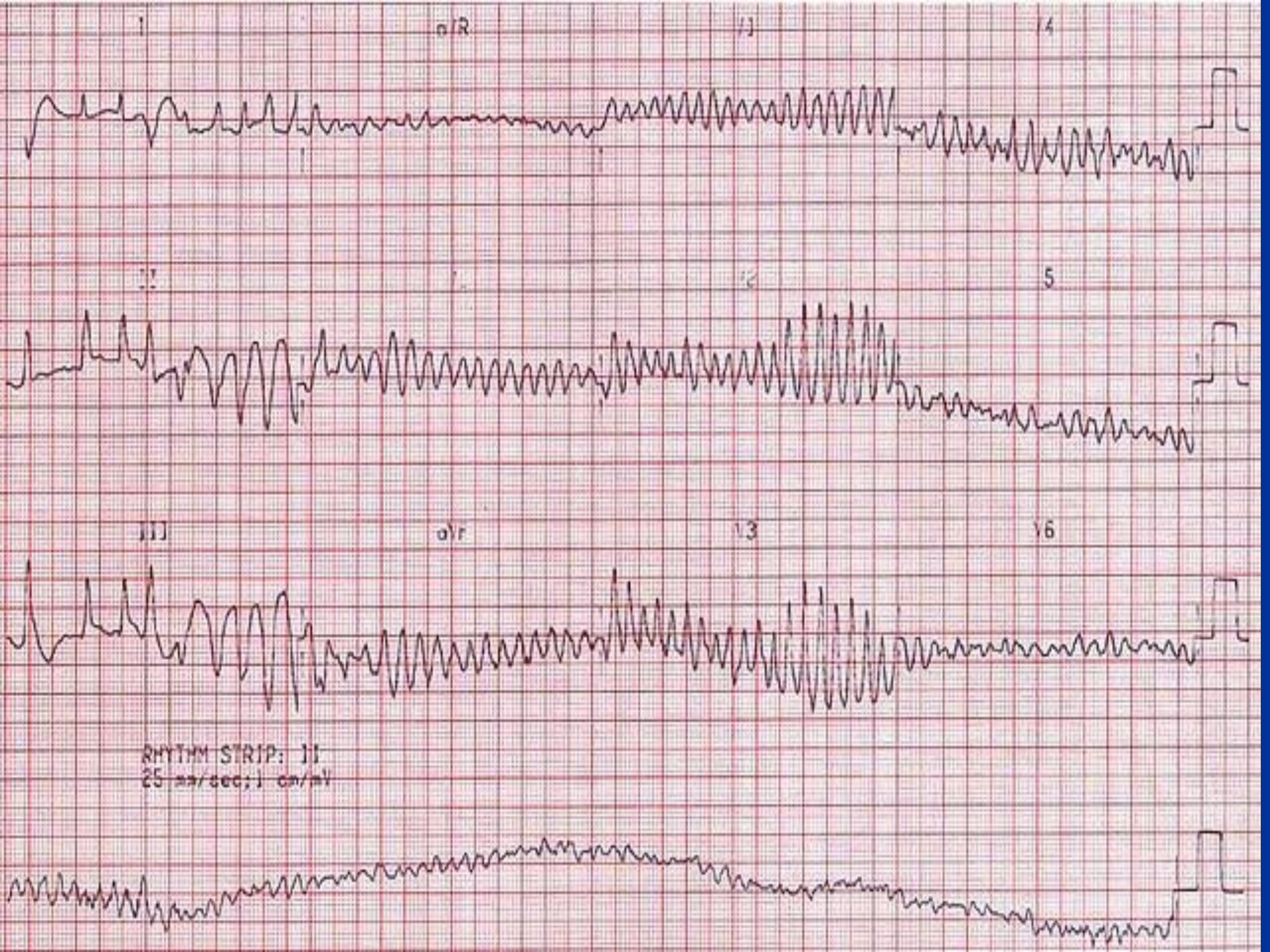
- SMUR PITIE

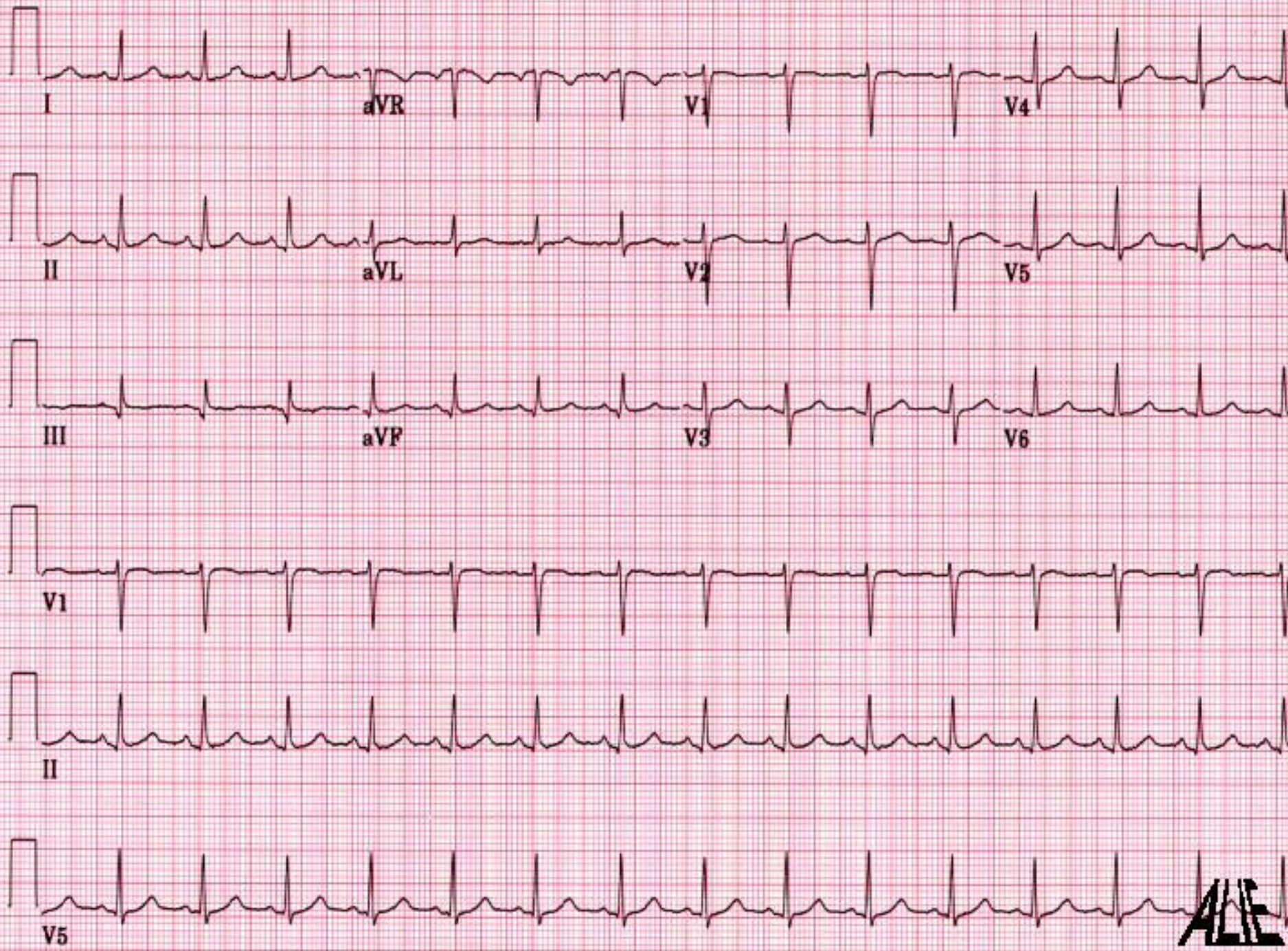
DAR PITIE SALPETRIERE

- URGENCES COCHIN HOTEL DIEU

Peco

- http://www.dailymotion.com/video/x78jpw_fibrillation-ventriculaire_news

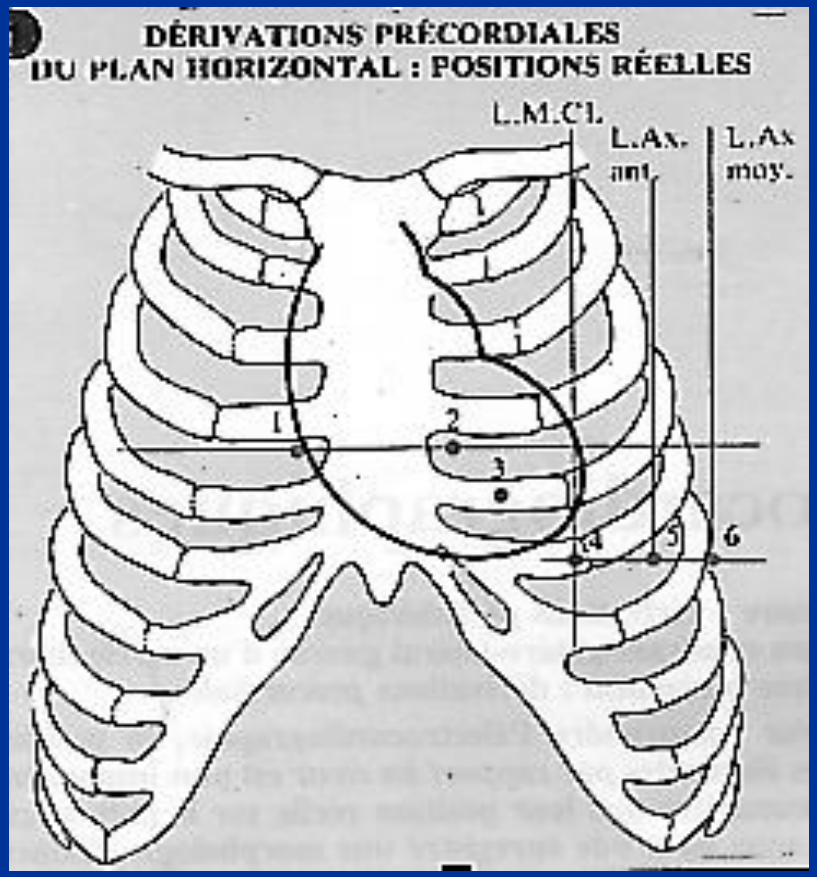

I
aVR
V1
V4
II
V2
V5
III
aVF
V3
V6
RHYTHM STRIP: II
25 mm/sec; 1 cm/mV

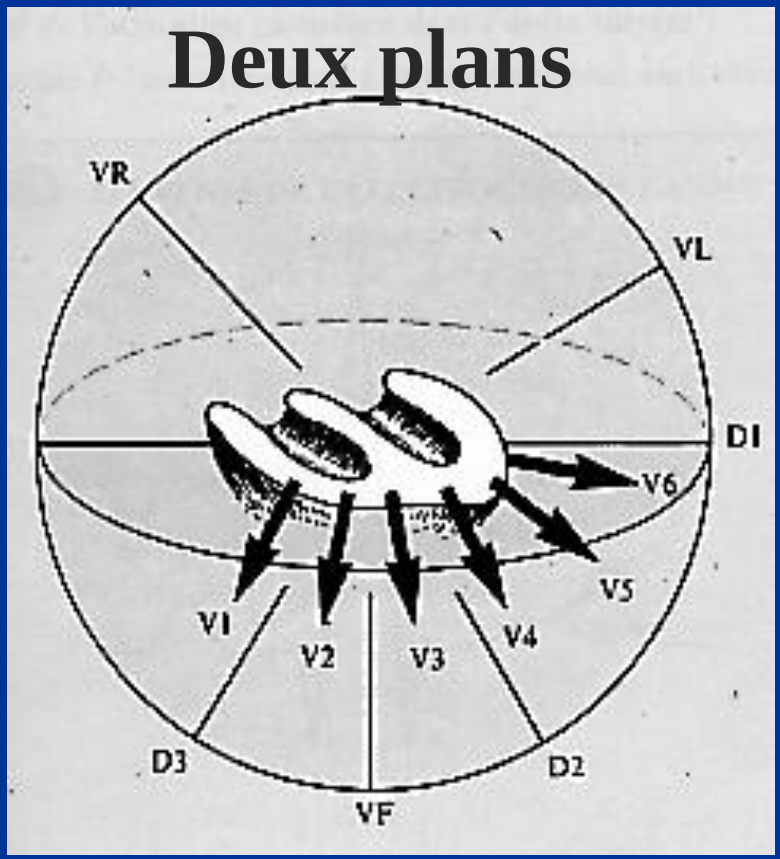

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5

Notion électrocardiographique de base

7

Les dérivations

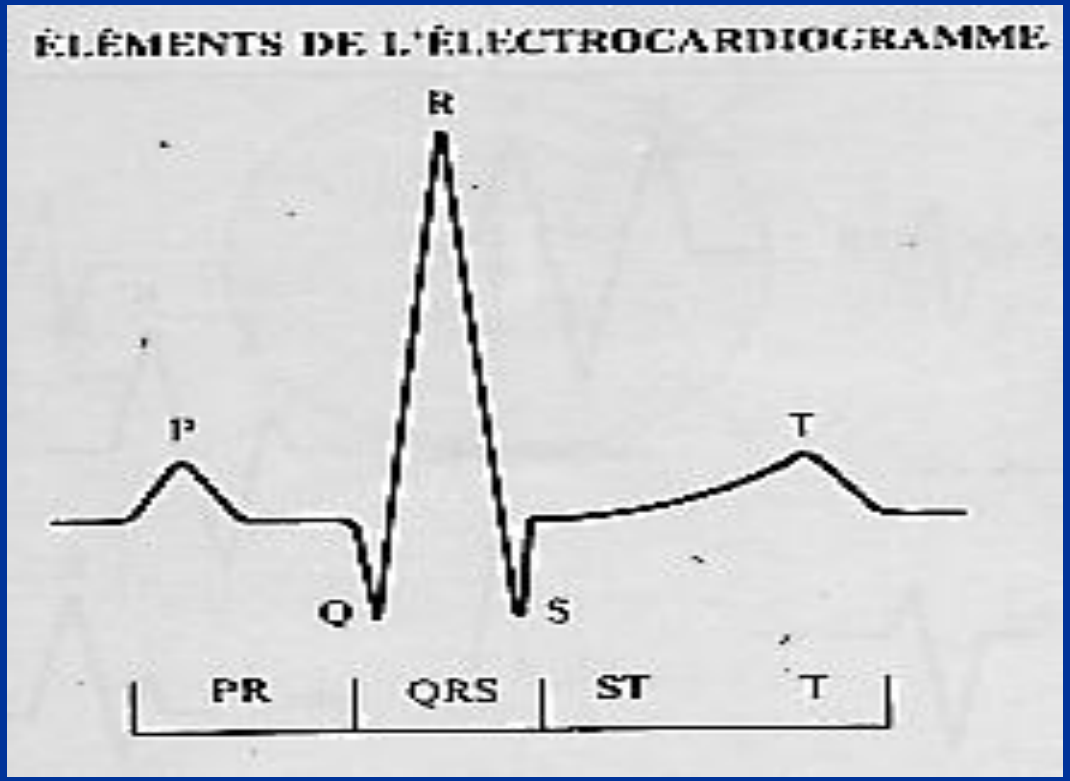




Peco

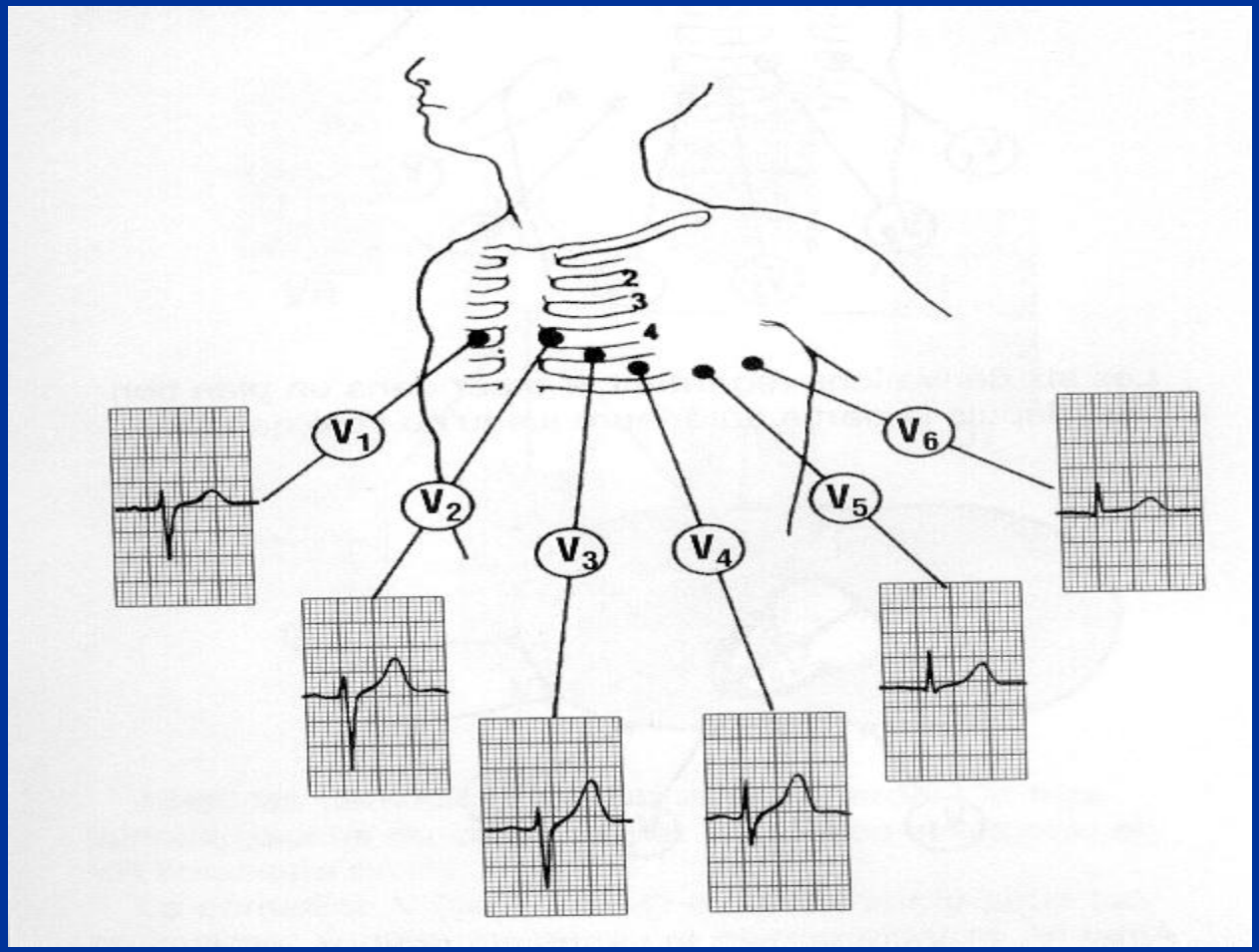
Aspect ECG des variations du vecteur cardiaque

(dérivation à la pointe du cœur)



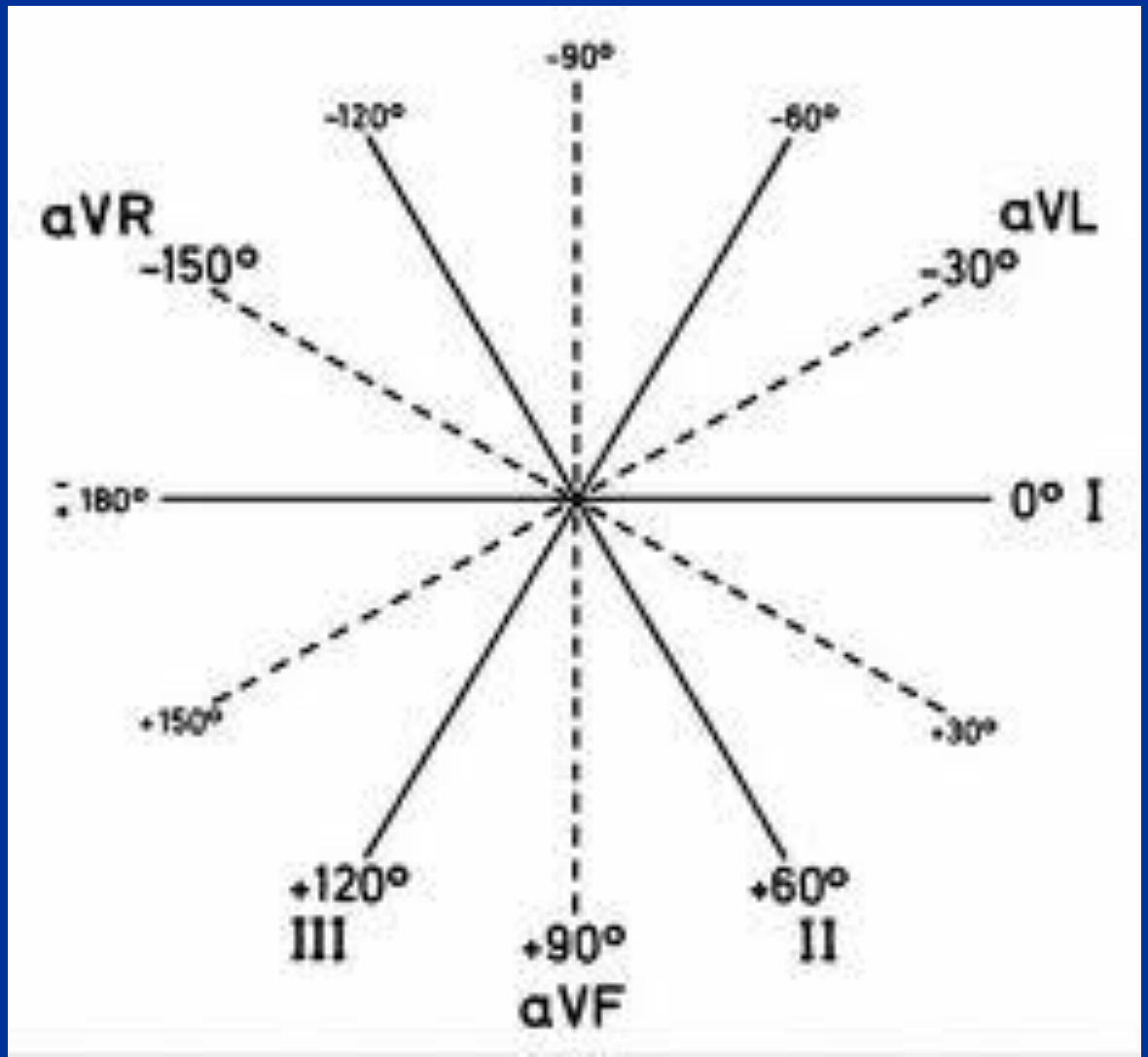
Peco

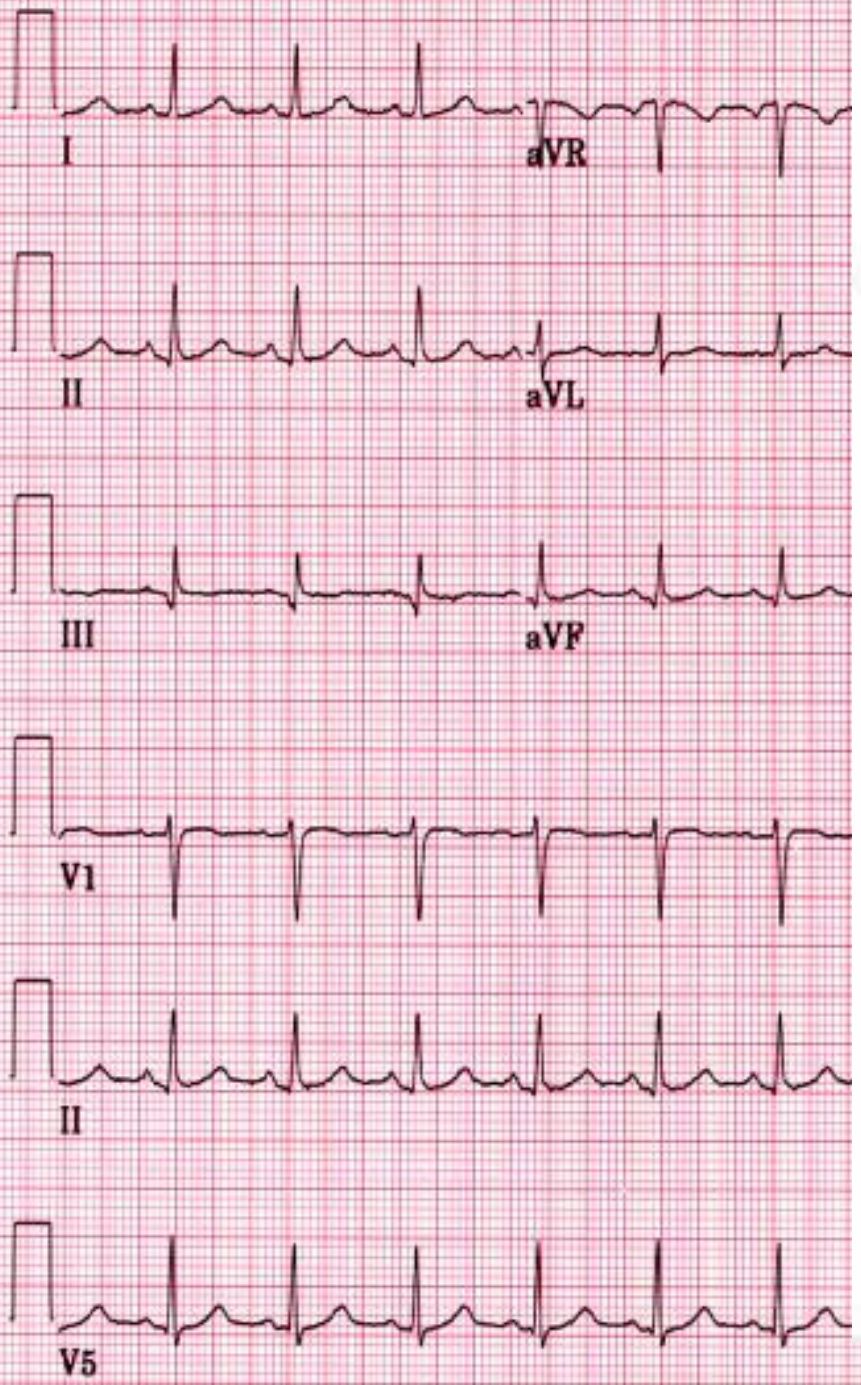
Aspect ECG dans les dérivations précordiales

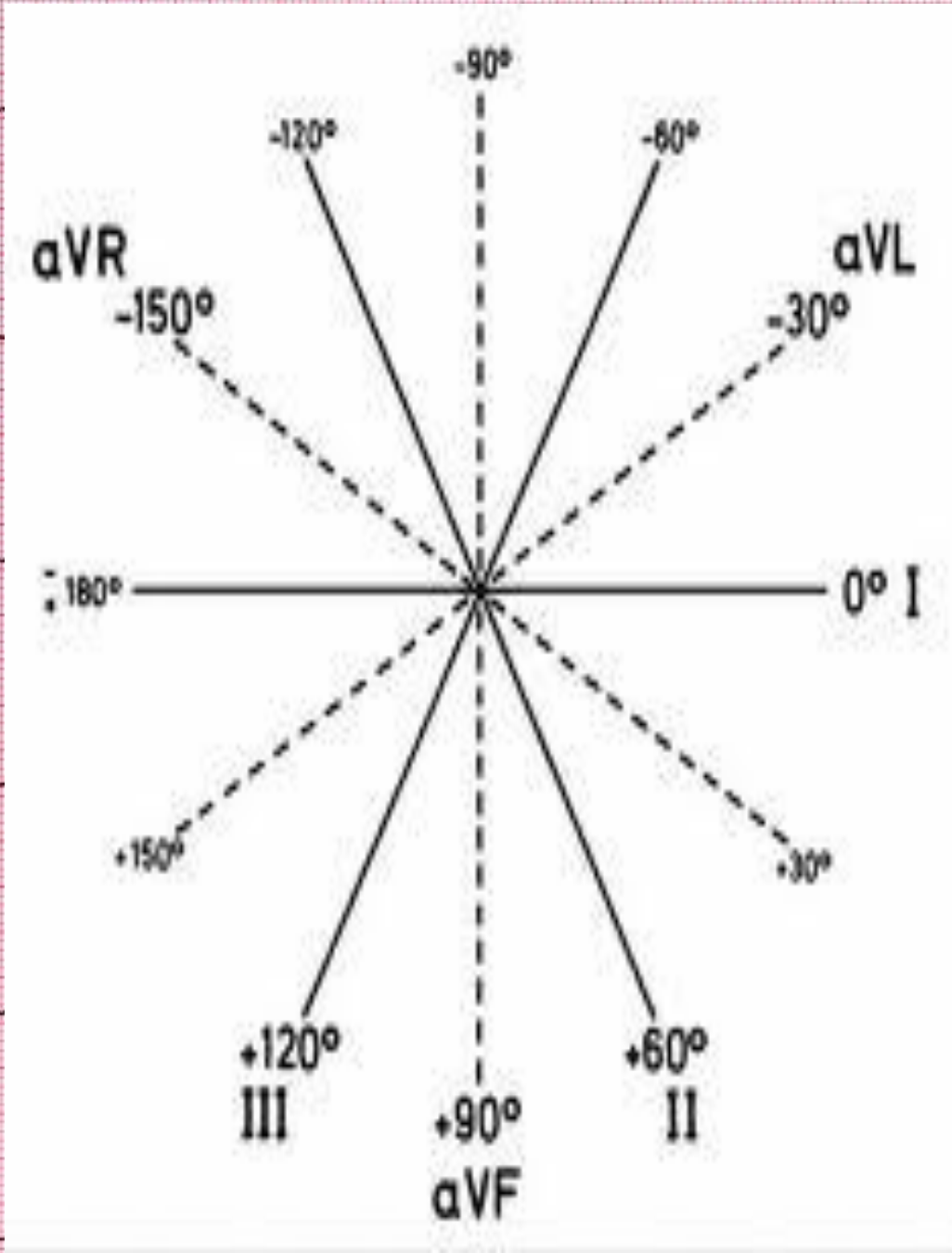


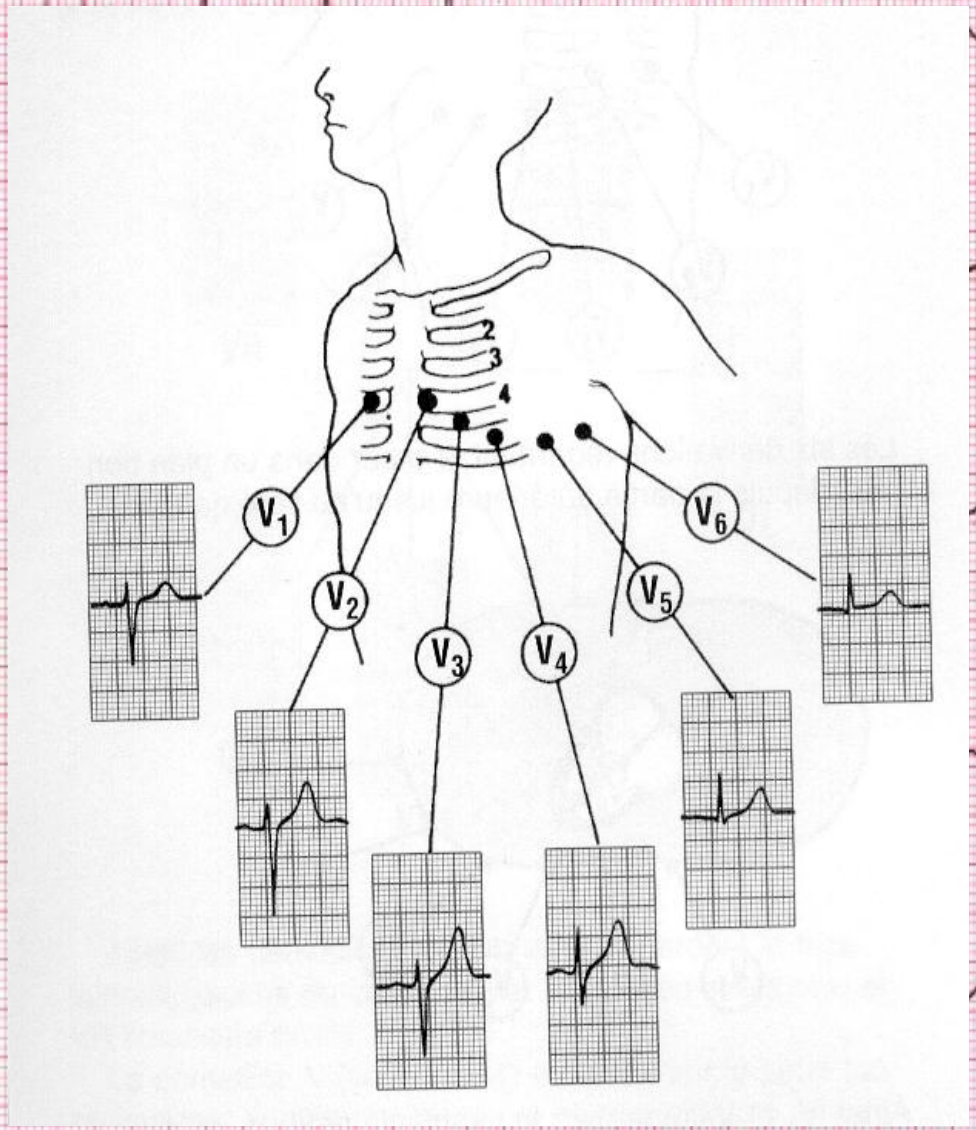
Peco

Aspect ECG dans les dérivations autres dérivations




I
aVR
II
aVL
III
aVF
V1
II
V5


-90°
-120°
-60°
aVR
aVL
-150°
-30°
180°
0° I
+150°
+30°
+120°
III
+90°
aVF
+60°
II



V1 V4

V2 V5

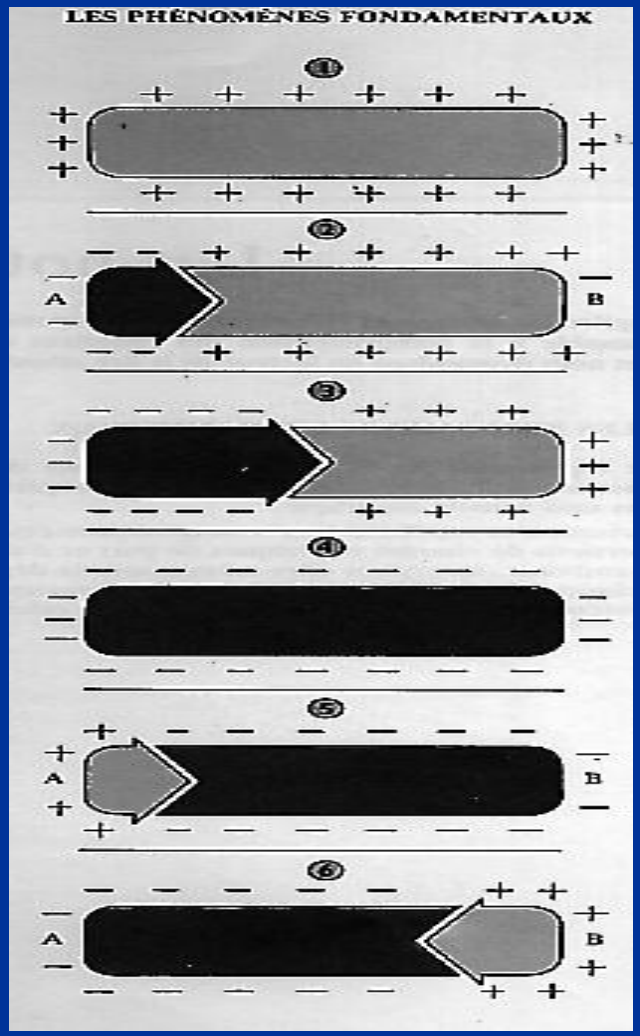
V3 V6

V5

Notion électrocardiographique de base

1

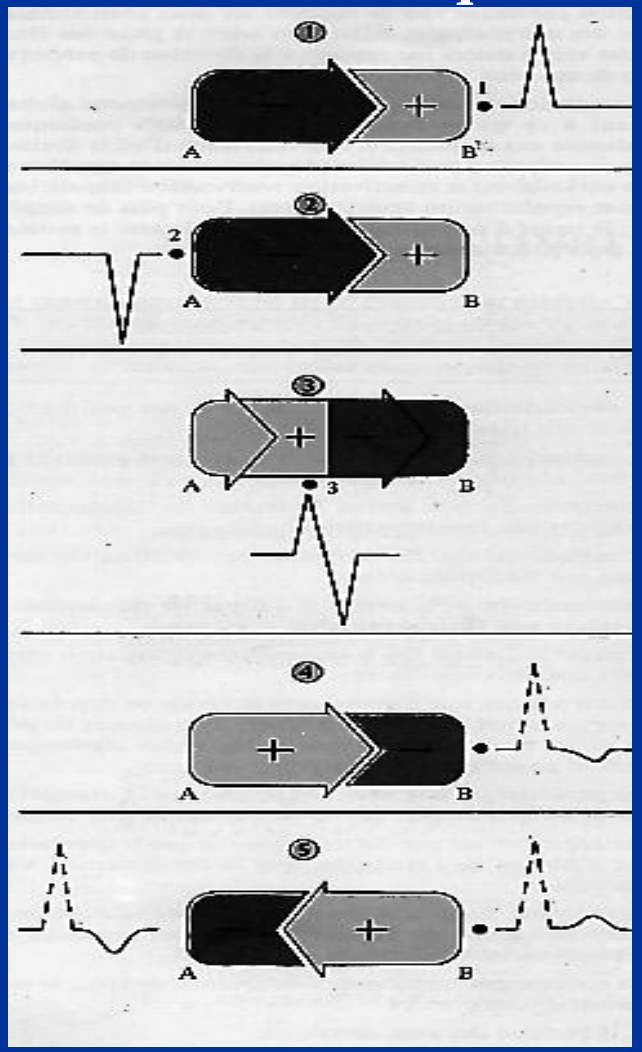
La cellule cardiaque



Dépolarisation

Repolarisation

Le vecteur cardiaque

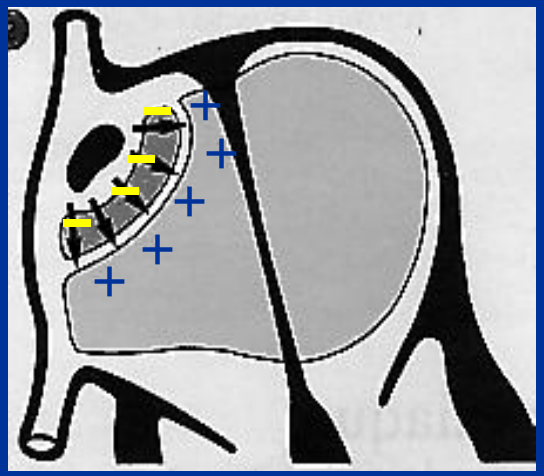


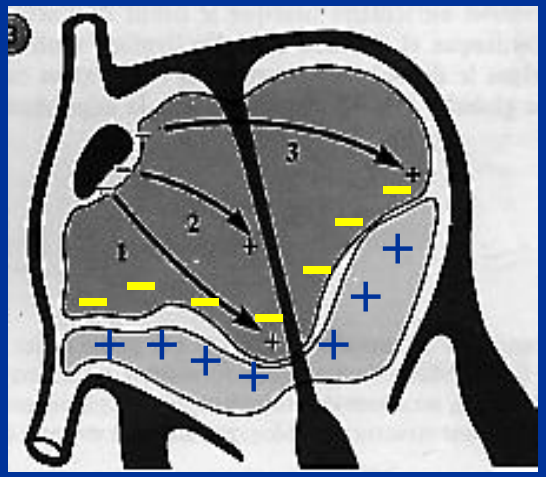
Peco

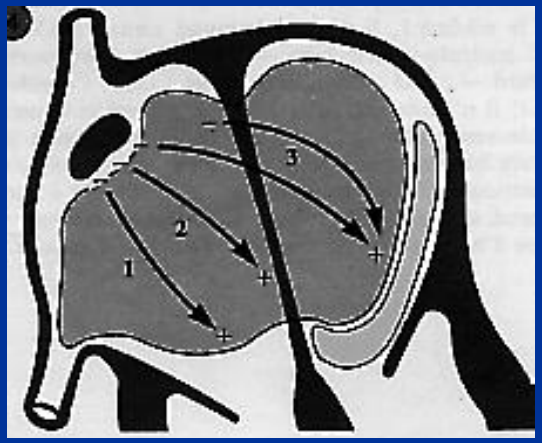
Notion électrocardiographique de base

2

Dépolarisation des oreillettes



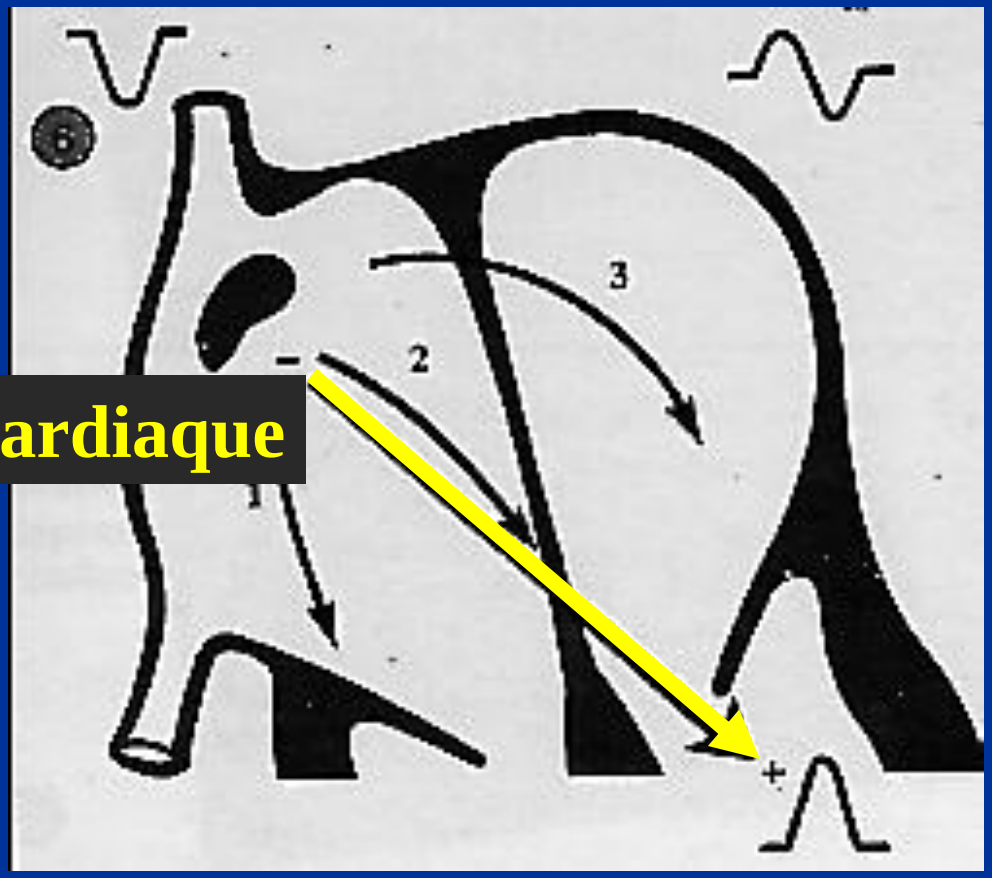




Notion électrocardiographique de base

3

Aspect électrocardiographique

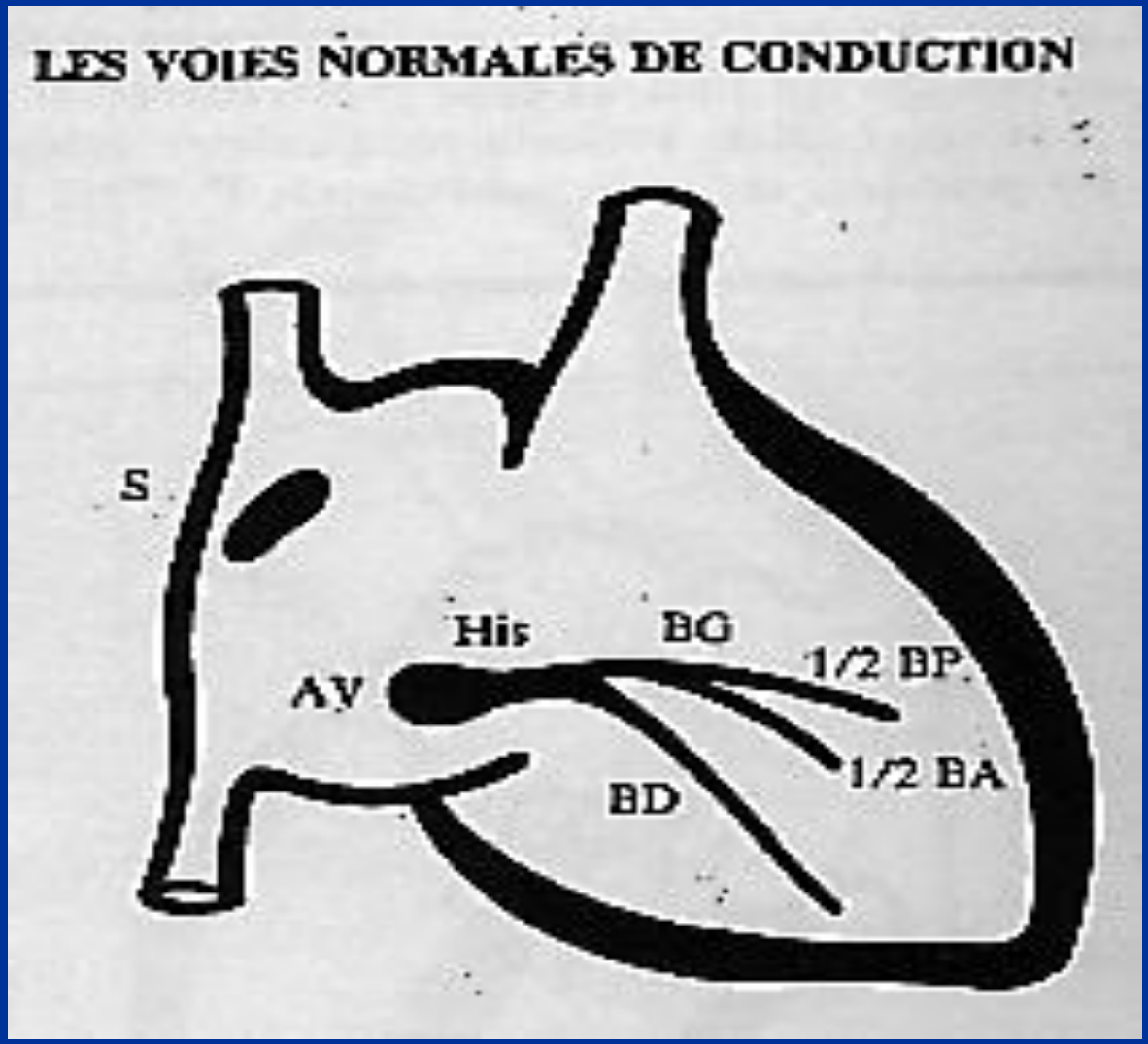


Le vecteur cardiaque

Peco

Notion électrocardiographique de base

4

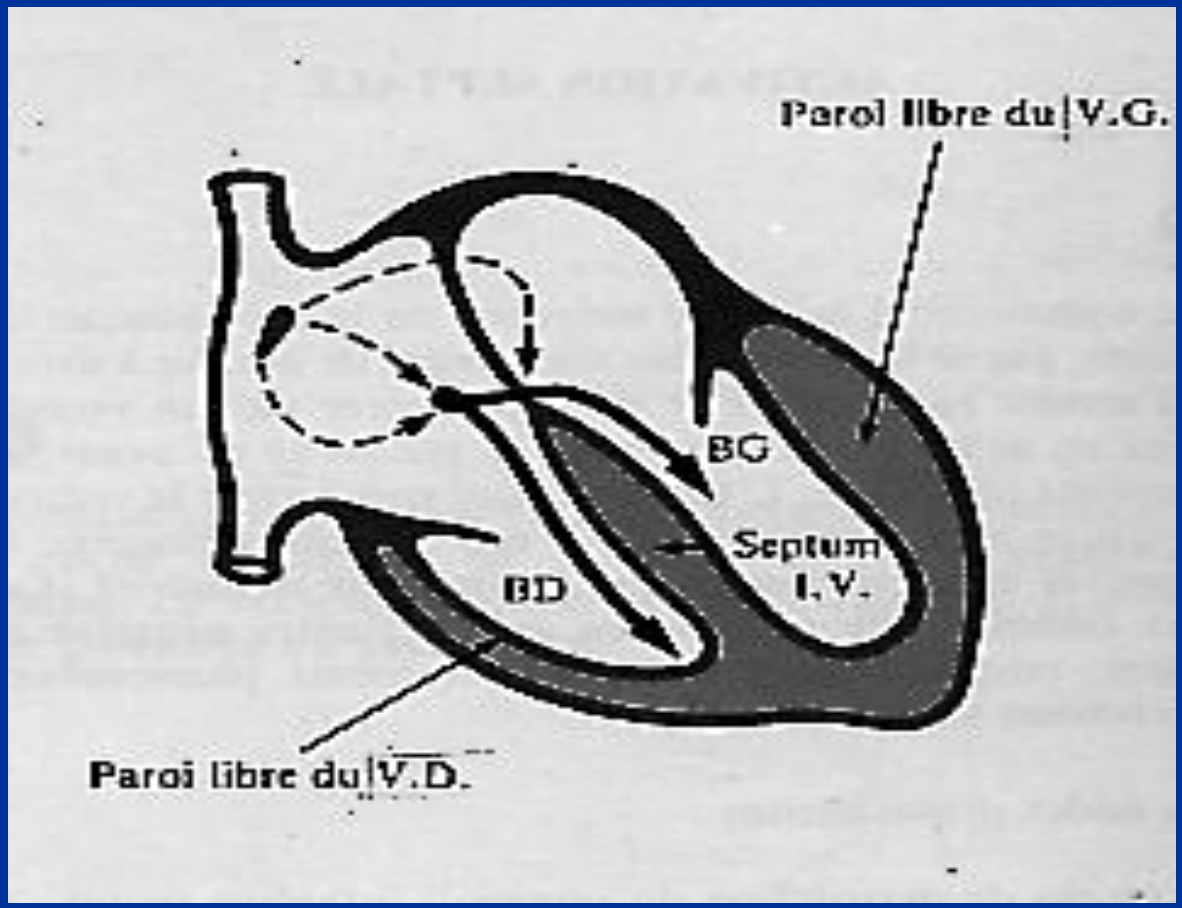


Peco

Notion électrocardiographique de base

5

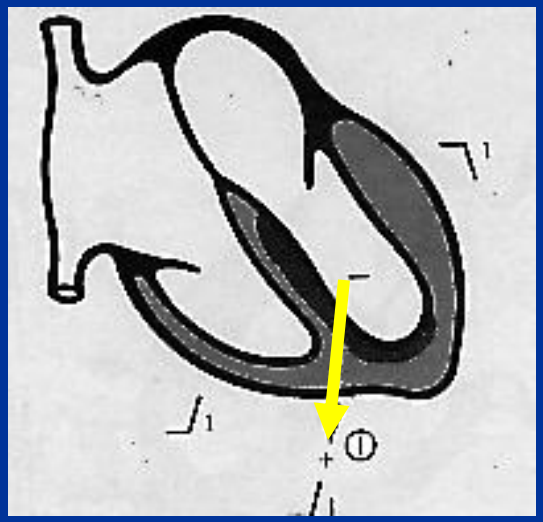
Dépolarisation ventriculaire

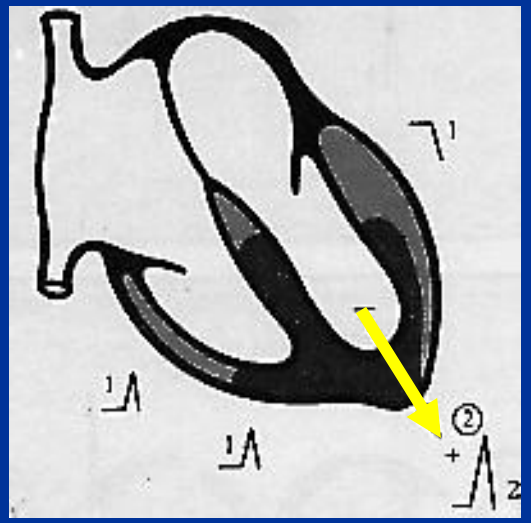


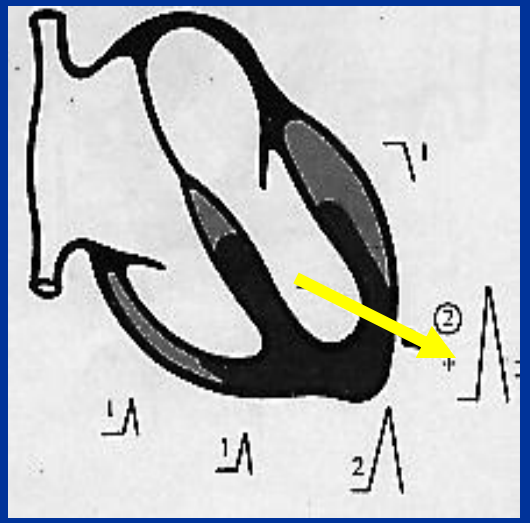
Peco

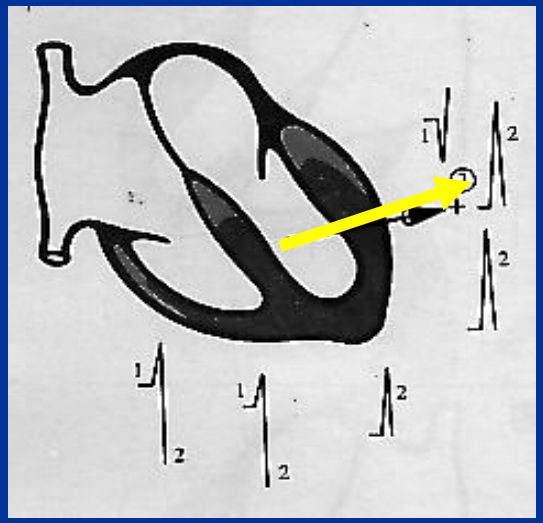
Notion électrocardiographique de base

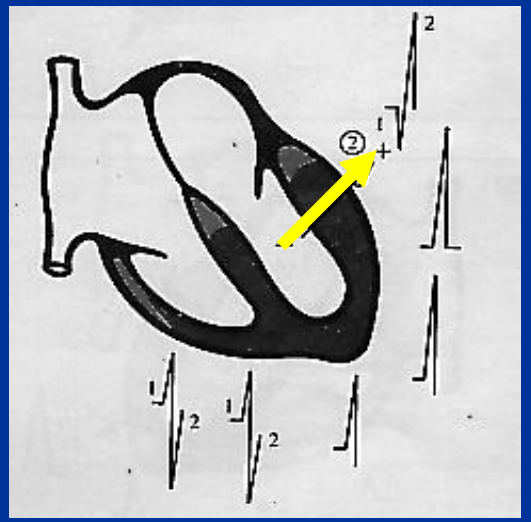
6

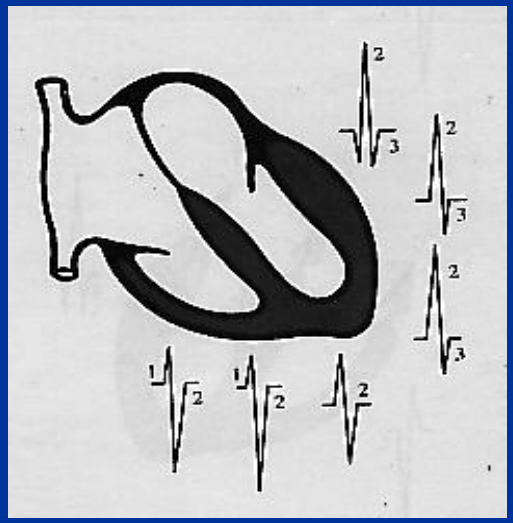










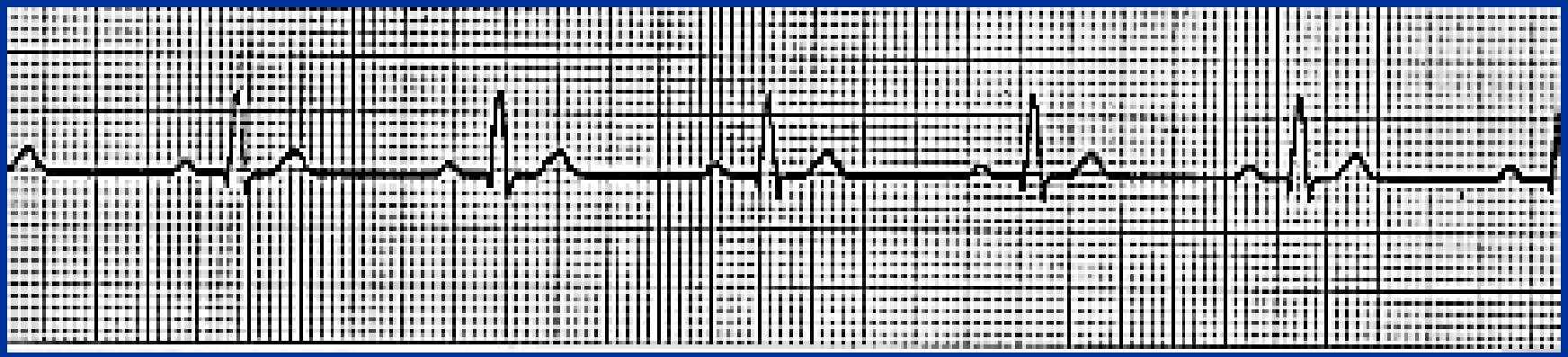


Peco

Interprétation d'un ECG

- Valeur d'un ECG de référence
- Utilisation d'un tracé multi-pistes

Rythme sinusal



Tachycardie/Bradycardie

- Fréquence cardiaque :

  moins de 50 cycles / min

  plus de 150 cycles / min

  parfois entre 50 et 150 !

Peco

Extrasystole auriculaire

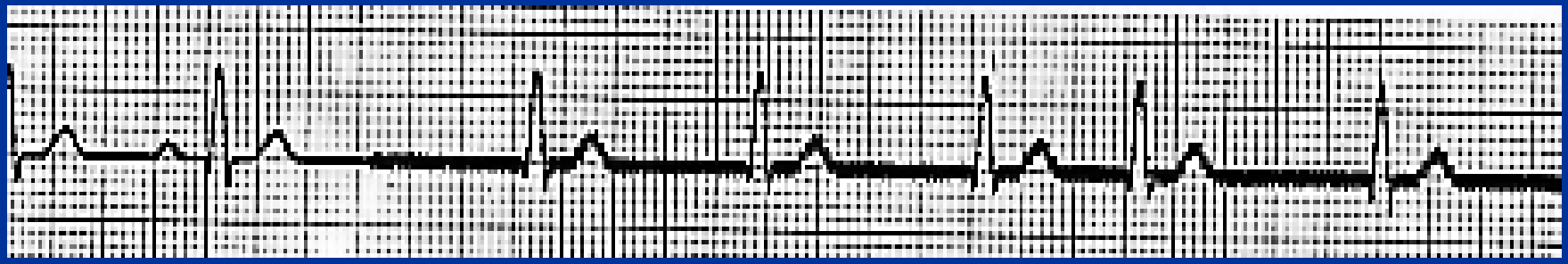
P différente et précoce

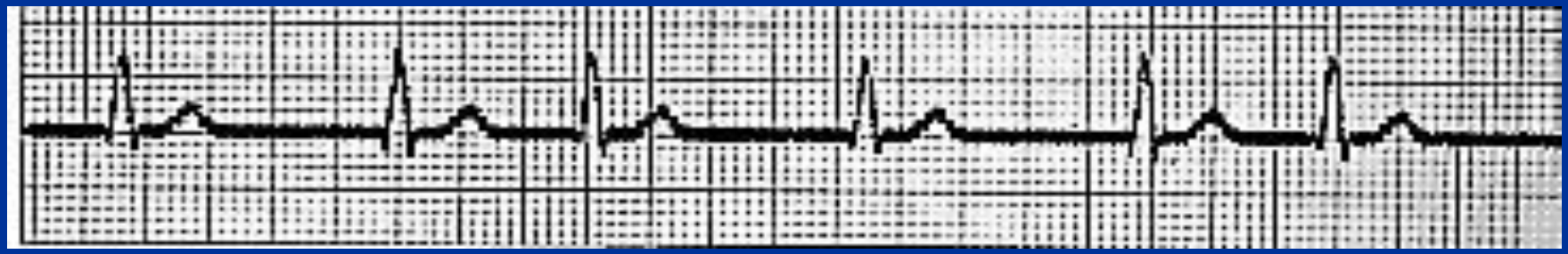
Extrasystole Ventriculaire

ESV (QRS large sans onde P)

Bradycardie sinusale

Arythmie complète par fibrillation auriculaire (AC/FA)





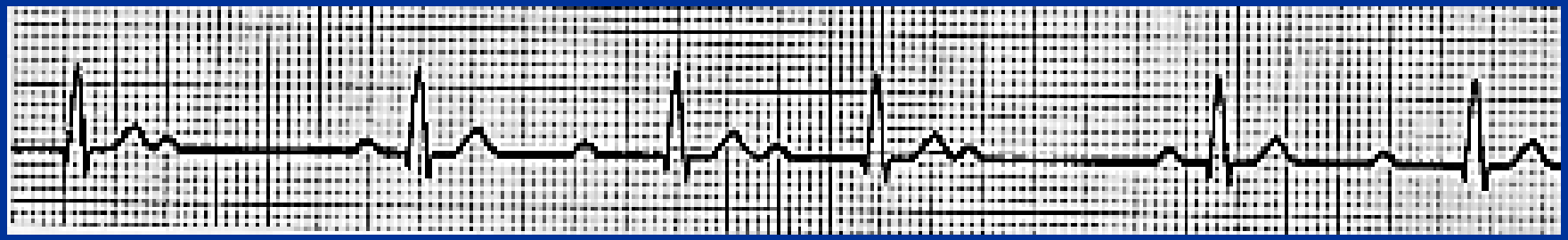
Bloc sino-auriculaire

P ?

Bloc auriculo-ventriculaire

BAV I

BAV II type 1 (période Lucciani-Wenckebach)

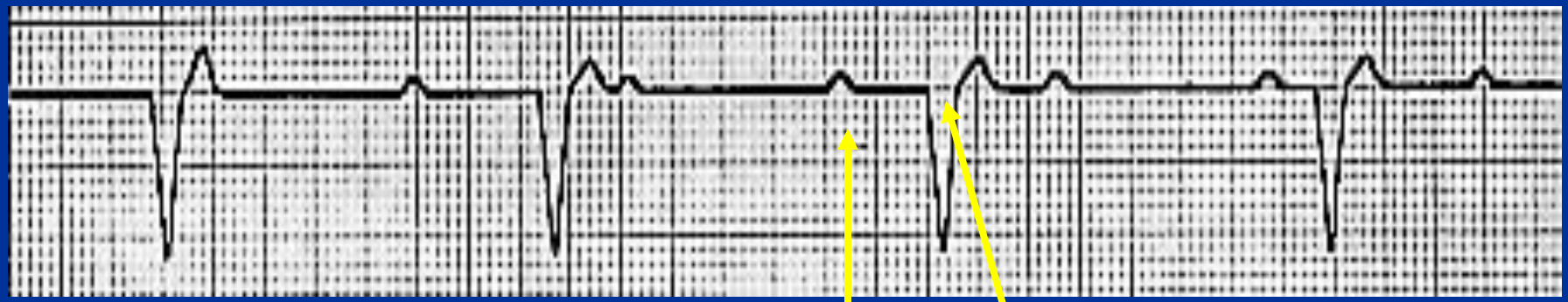


BAV II type 2

Peco

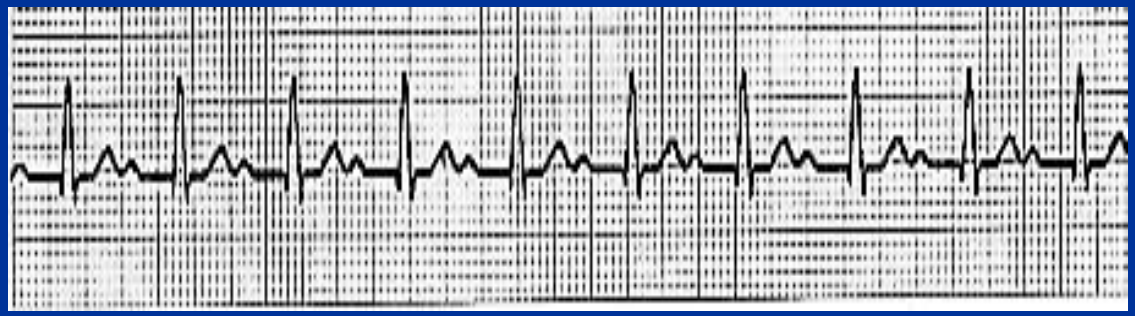
Bloc auriculo-ventriculaire

BAV III



Dissociation complète des P et QRS souvent élargies
PR non constant

Peco



Tachycardie sinusale

Ondes P (partant du sinus) parfois difficiles à voir

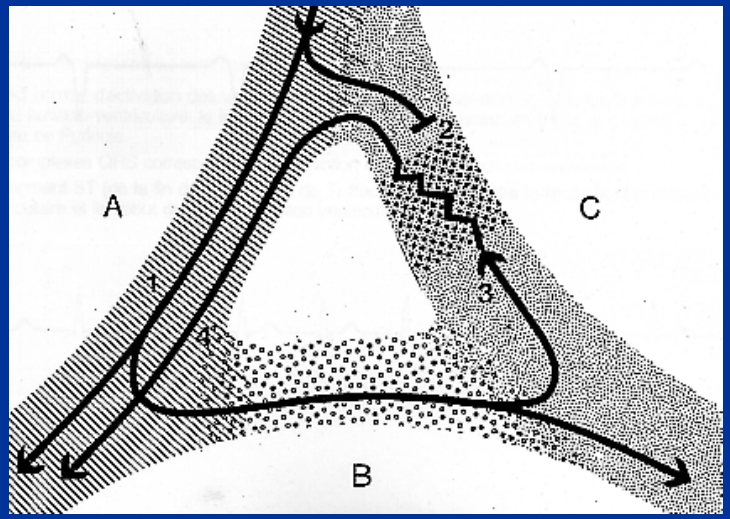
Tachysystolie auriculaire

Ondes P partant d'un foyer auriculaire ectopique

Flutter

Tachycardies jonctionnelles 1

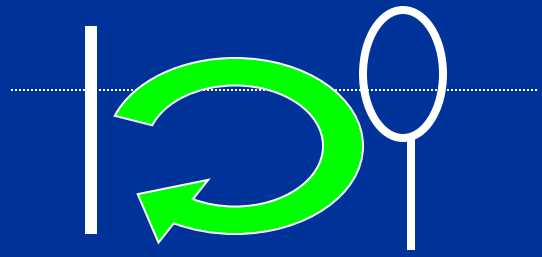
À l intérieur du nœud A-V
2 fibres de conduction
A et C forme par saut
de dépolarisation (B) une
boucle auto-entretenue



Peco

Tachycardies jonctionnelles 2

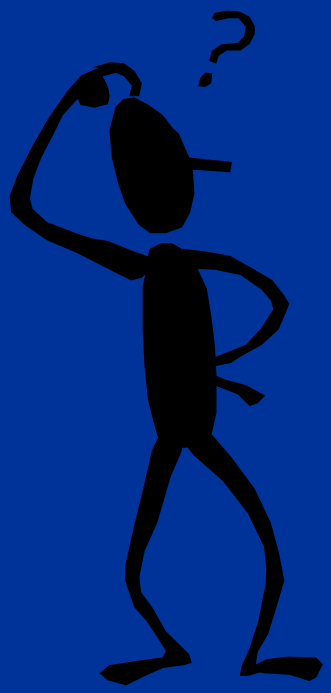
Boucle possible avec voies normales et faisceau accessoire (WPW)



ECG hors tachycardie

PR court et onde delta

Conduite diagnostic



- Pour une interprétation pratique

4 questions:

❶ Quel rythme?

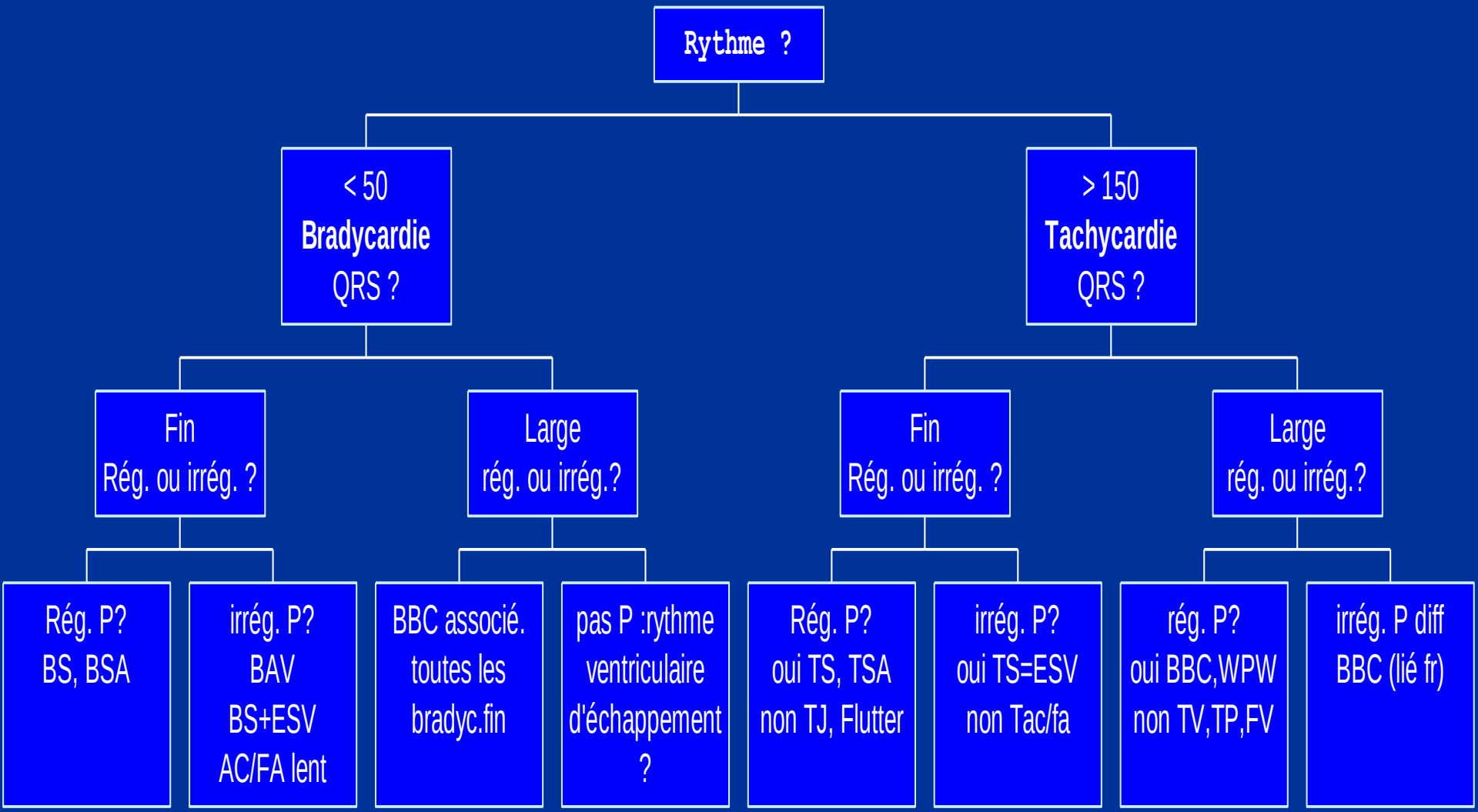
❷ Largeur du QRS? (> ou < 0.08 s)

❸ Aspect régulier ou irrégulier ?

❹ existe-t-il des ondes P ?

Peco

Algorithme des troubles du rythme



Peco

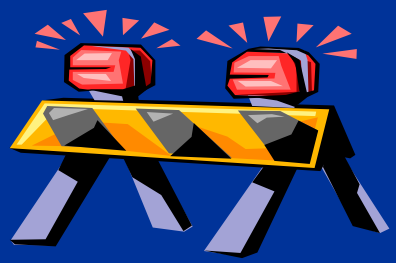
Conduite Pratique

- Le problème est de savoir si :

DANGER immédiat ou non ?

Si QRS fin peu de risque

si QRS large et Tachycardie ATTENTION à la *TACHYCARDIE VENTRICULAIRE*

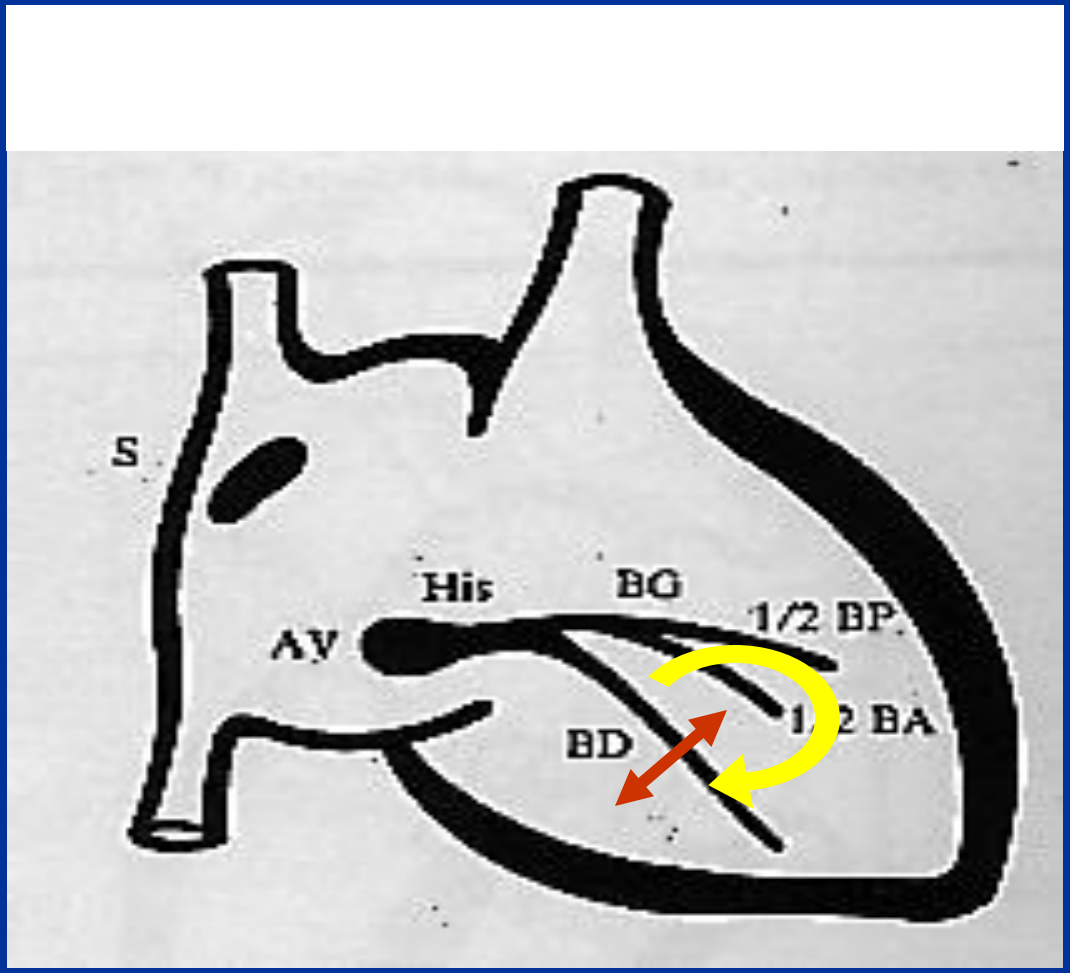


Peco

Tachycardie à QRS Large

- **Bloc de branche complet (onde P)**
- **Syndrome de préexcitation antiD (onde P)**
- **Tachycardie Ventriculaire**

Bloc de Branche (1)



Bloc de Branche (2)

Aspect élargie du QRS précédé d ’une onde P

QRS > 0,12 s

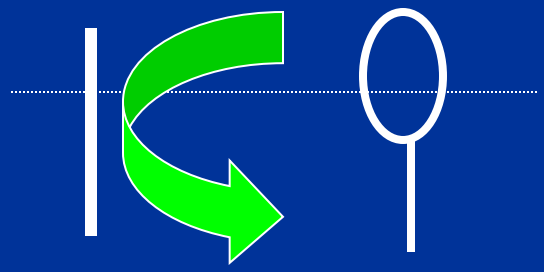
retard V1 → BBD

retard V6 → BBG

Peco

Tachycardie jonctionnelles

Boucle possible avec voies normales et faisceau accessoire (WPW)



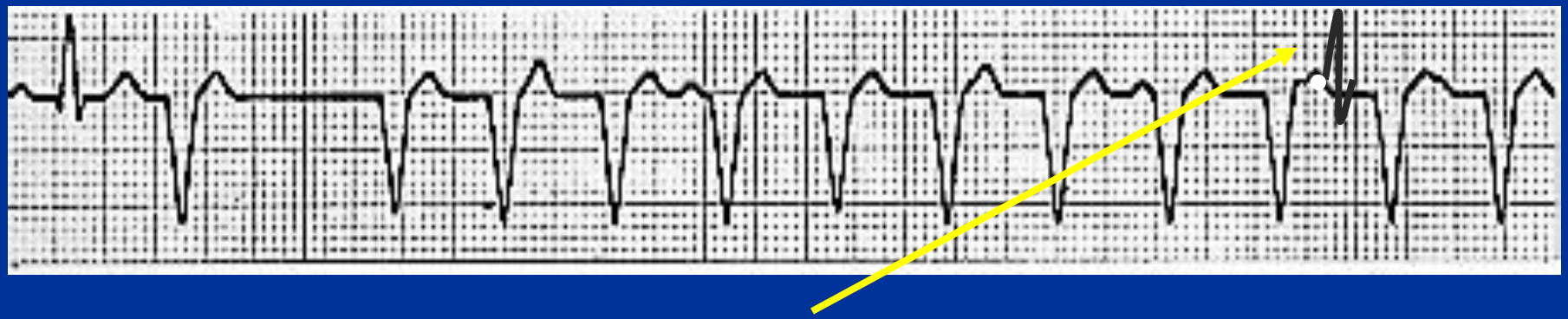
ECG en tachycardie

Diagnostic Tachycardie Ventriculaire

Aspect élargie du QRS sans onde P

Diagnostic Tachycardie Ventriculaire

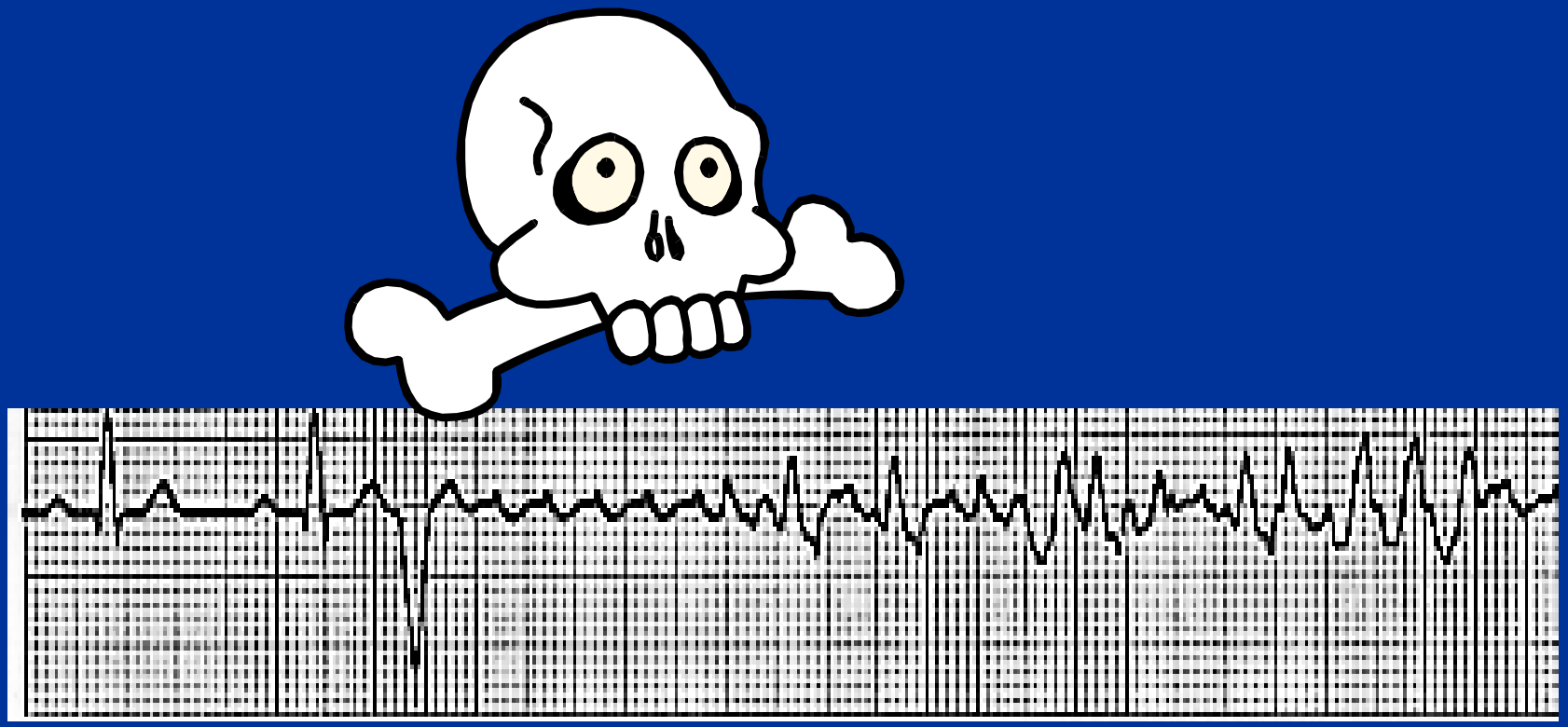
- Les captures et fusions sont des QRS normaux qui passent entre 2 complexes ventriculaires



- L ’existence de capture ou de fusion signe le diagnostic sinon incertitude!

Peco

Fibrillation ventriculaire



Pacemaker

Classification de Vaughan-Williams

Inh. sodique béta B inh. potassique inh. Calcique autres

classe I	*classe II*	*classe III*	*classe IV*	*autres*
A. Disopyramide Quinidine Procaïnamide Ajmaline (Cibenzoline)	β-bloquants	Sotalol Amiodarone Bretylium	Verapamil Diltiazem	Digitale Adénosine triphosphate
B. Lidocaïne Mexiletine				
C. Propafenone Flecainide Cibenzoline				

Classification clinique de TOUBOUL

- Sur la conduction auriculo-ventriculaire:
  - Bétabloquants, digitaliques, inh. Calciques, ATP
- Sur le myocarde auriculaire et/ou ventriculaire
  - Classe I
- Sur le myocarde et la conduction
  - Cordarone, Rythmol, Sotalex.

Les dangers des anti-arythmiques

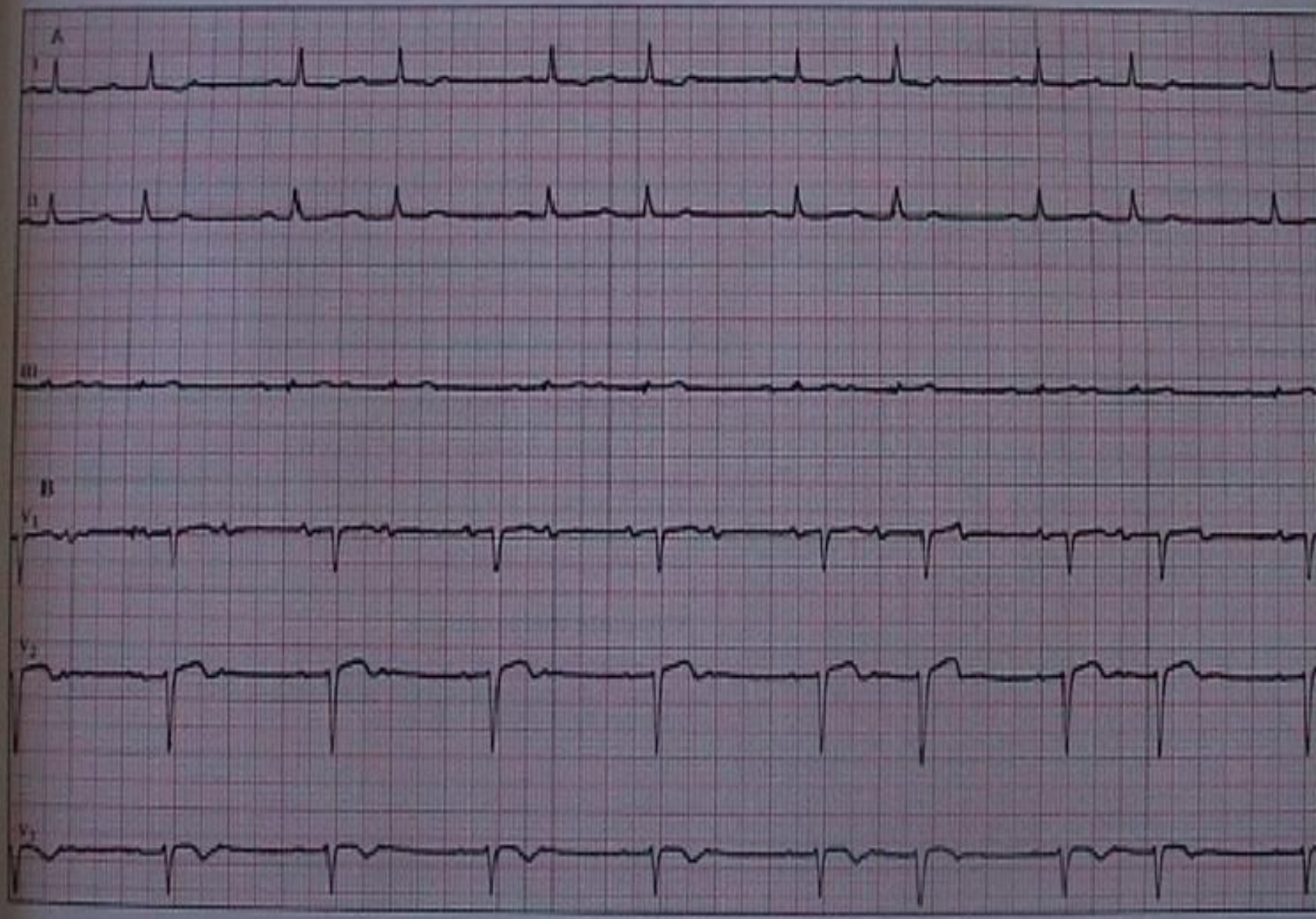
- Tous ionotropes négatif
- Éviter les associations
- Si « conduction » effet bradycardisant
- Certains allongent le QT (TP) (sérécor, longacor)
- Certains élargissent le QRS (Ic:flécaine cipralan, rythmol)
- La cordarone donne des dysthyroidies

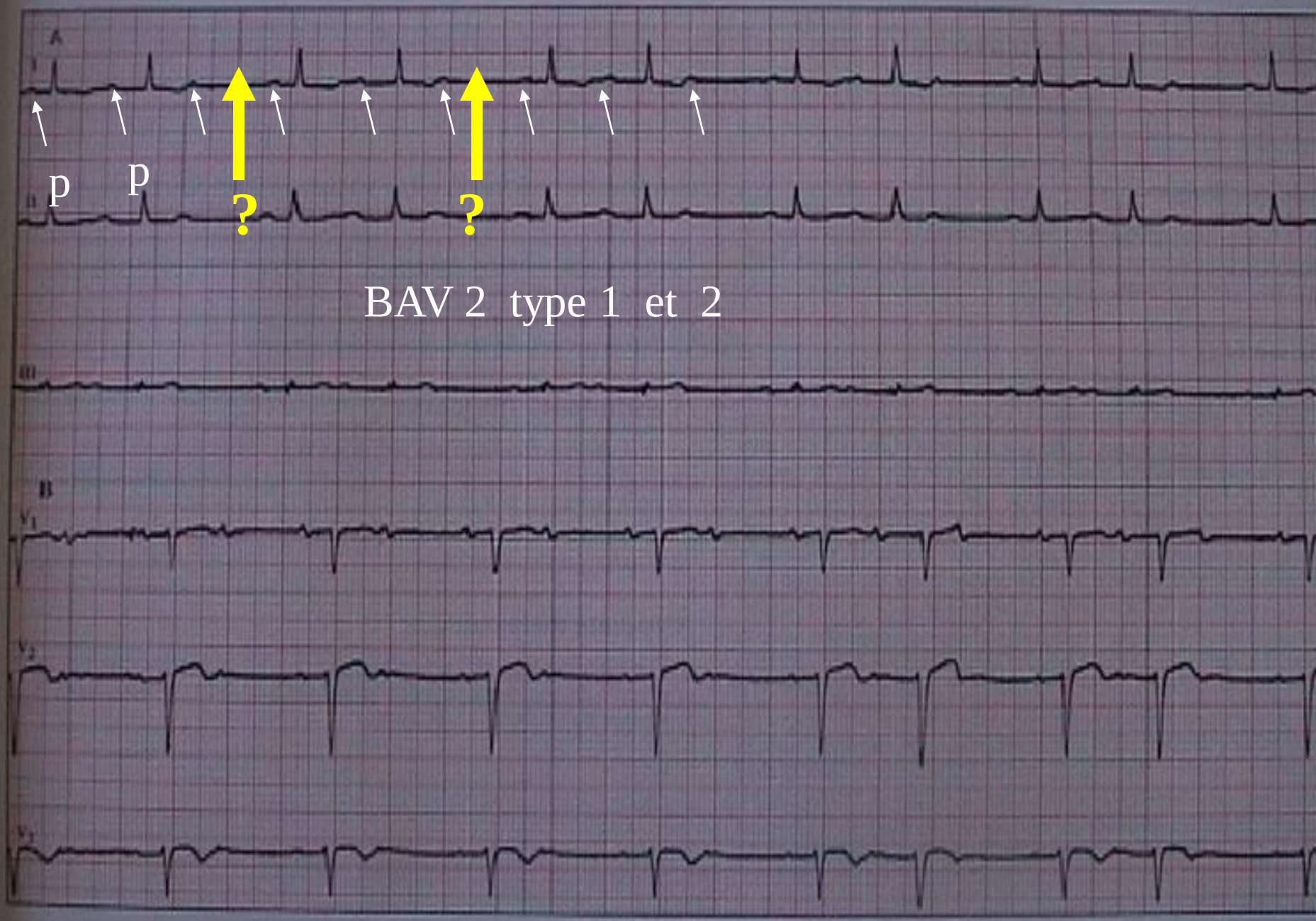
Quelques ECG

3 minutes de réflexion
Une feuille et un crayon si besoin
RYTHME?
QRS?
Régulier?
P?

A VOUS !!!

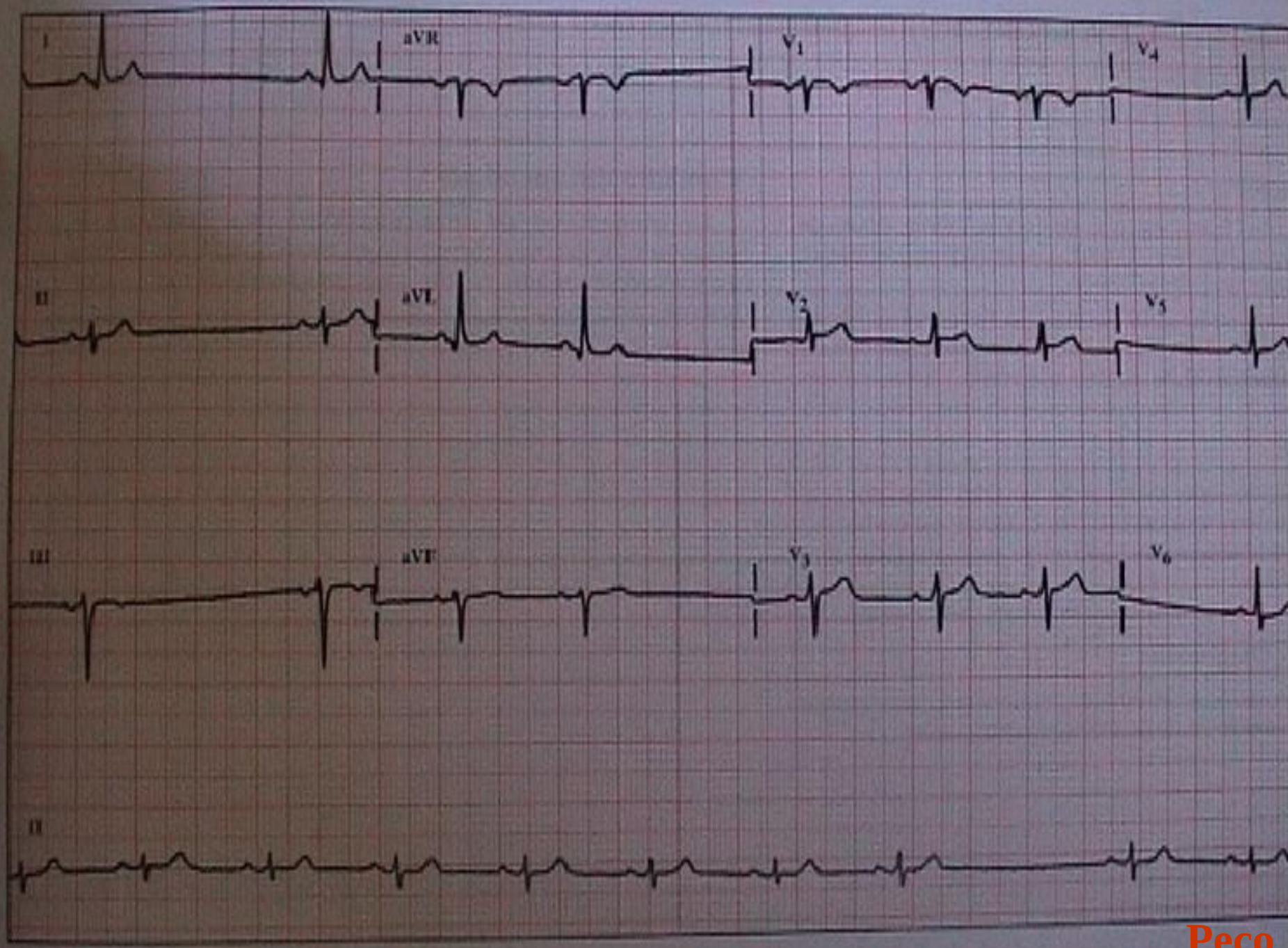
Peco

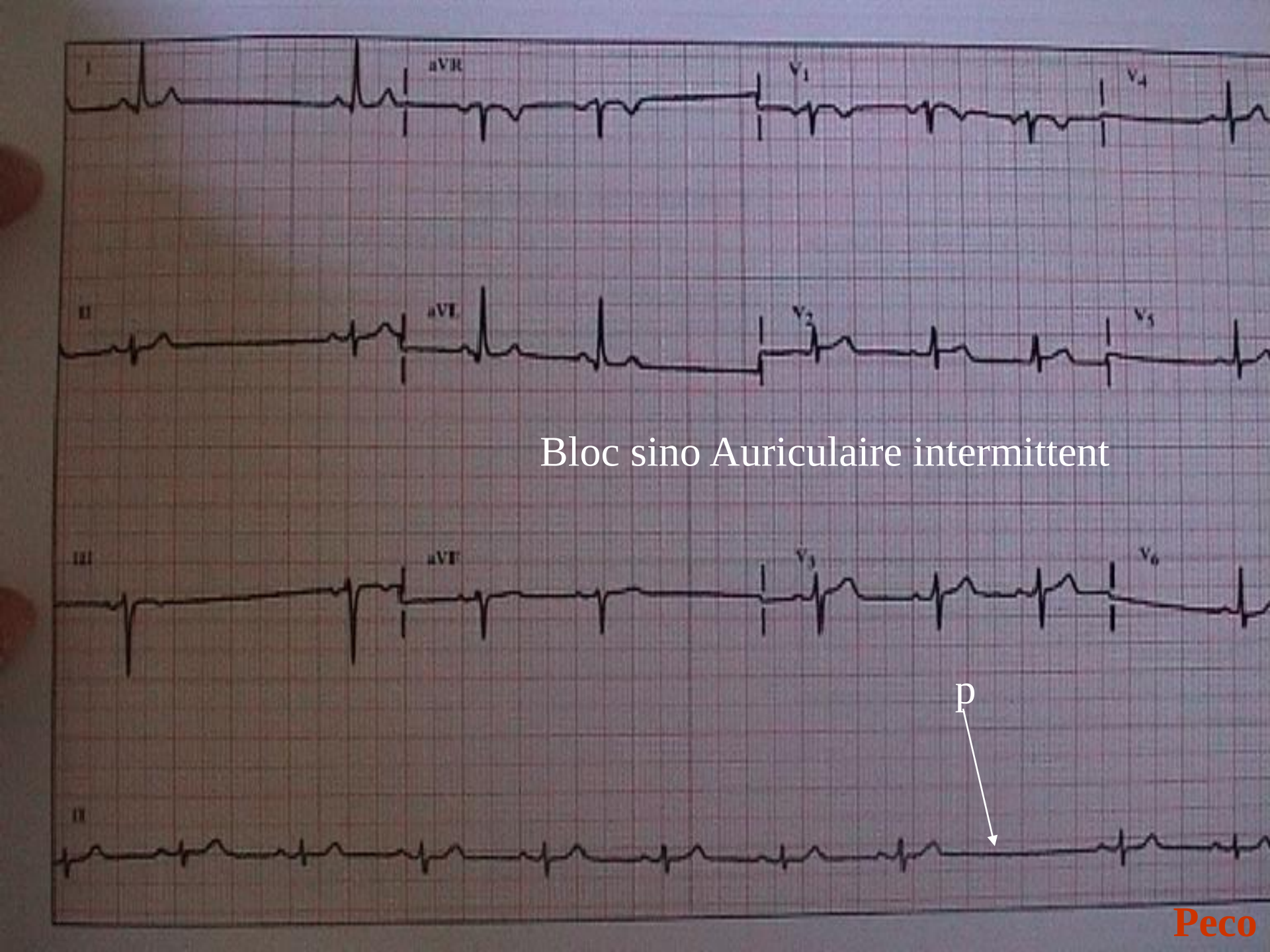


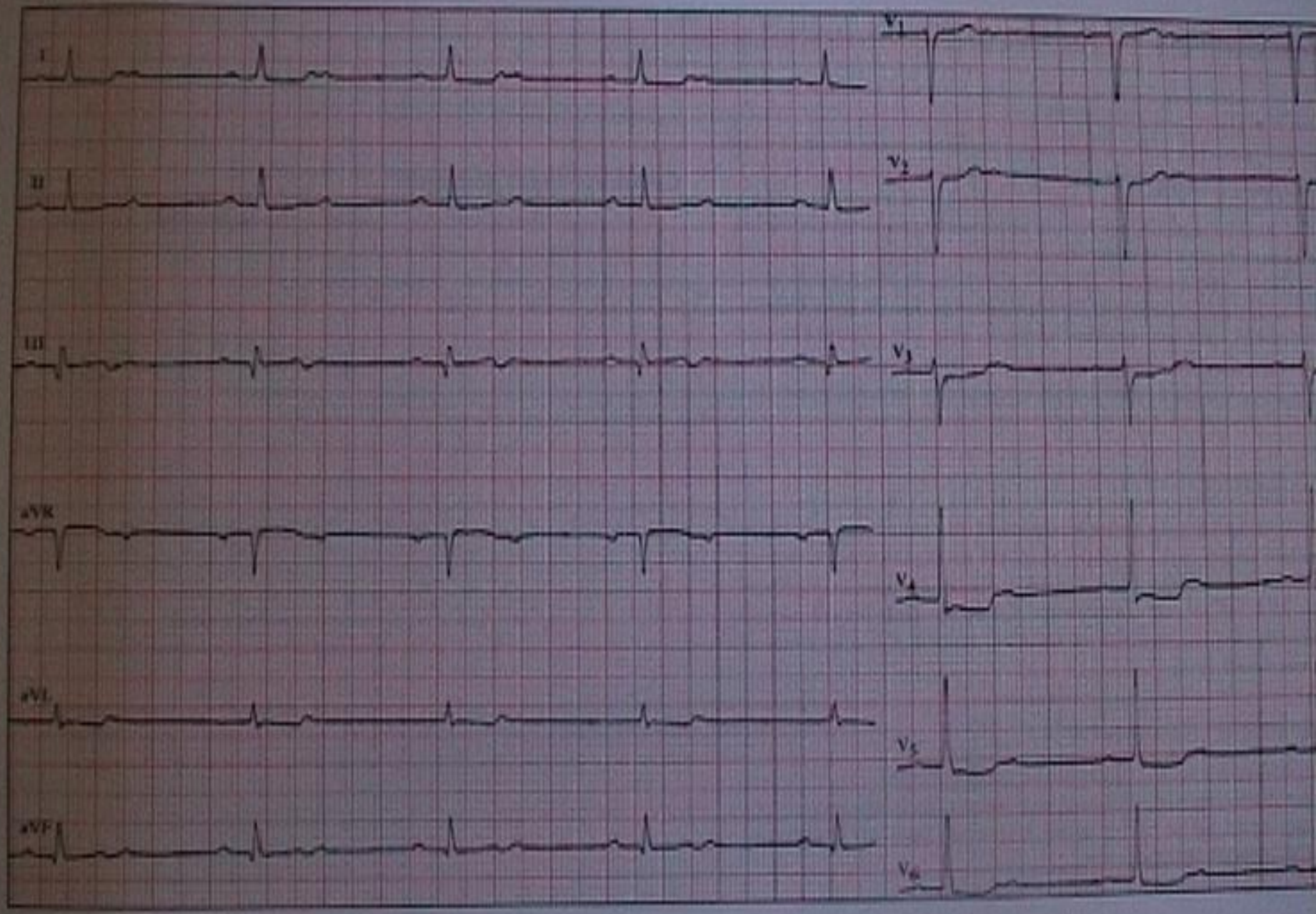


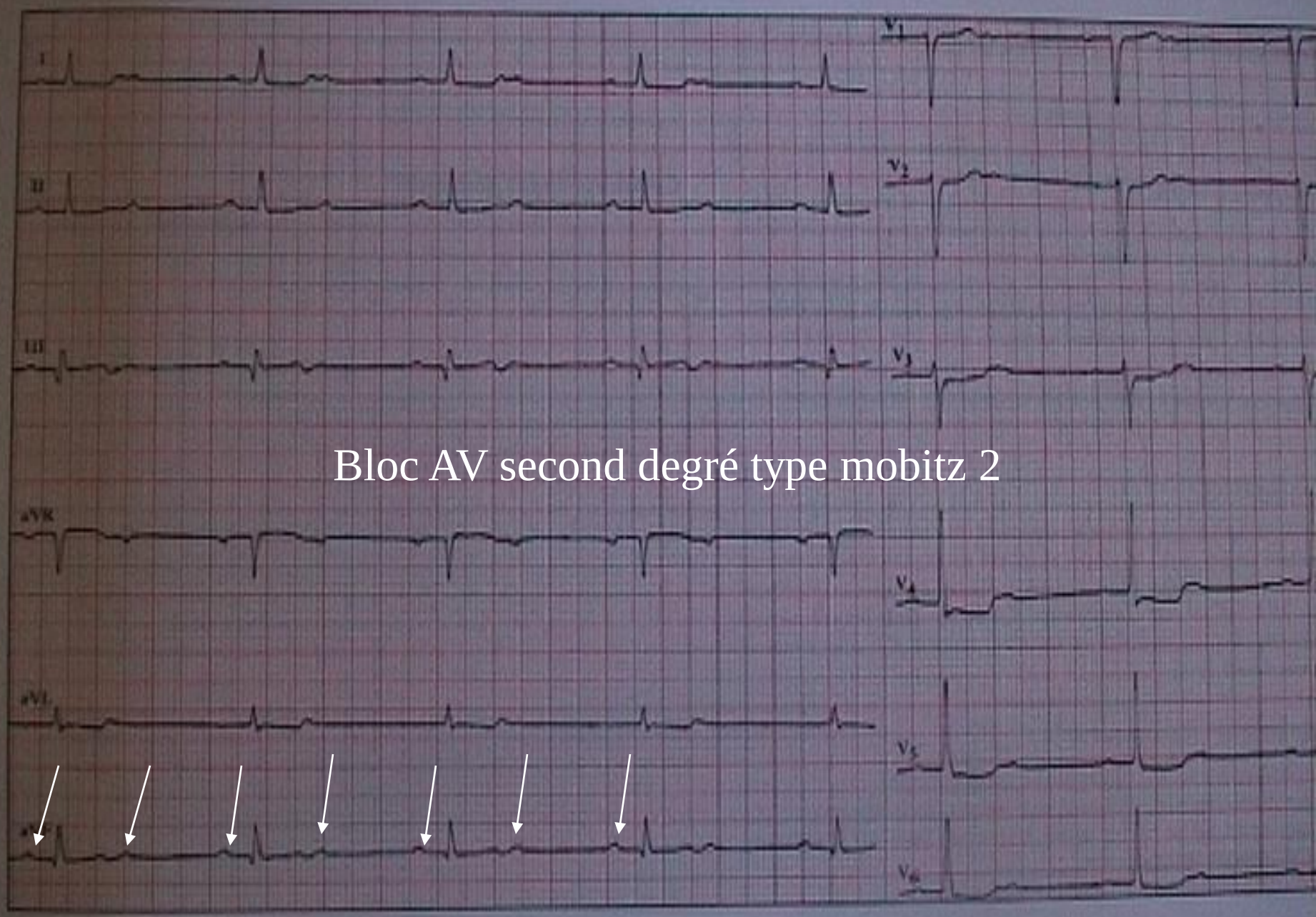
BAV 2 type 1 et 2

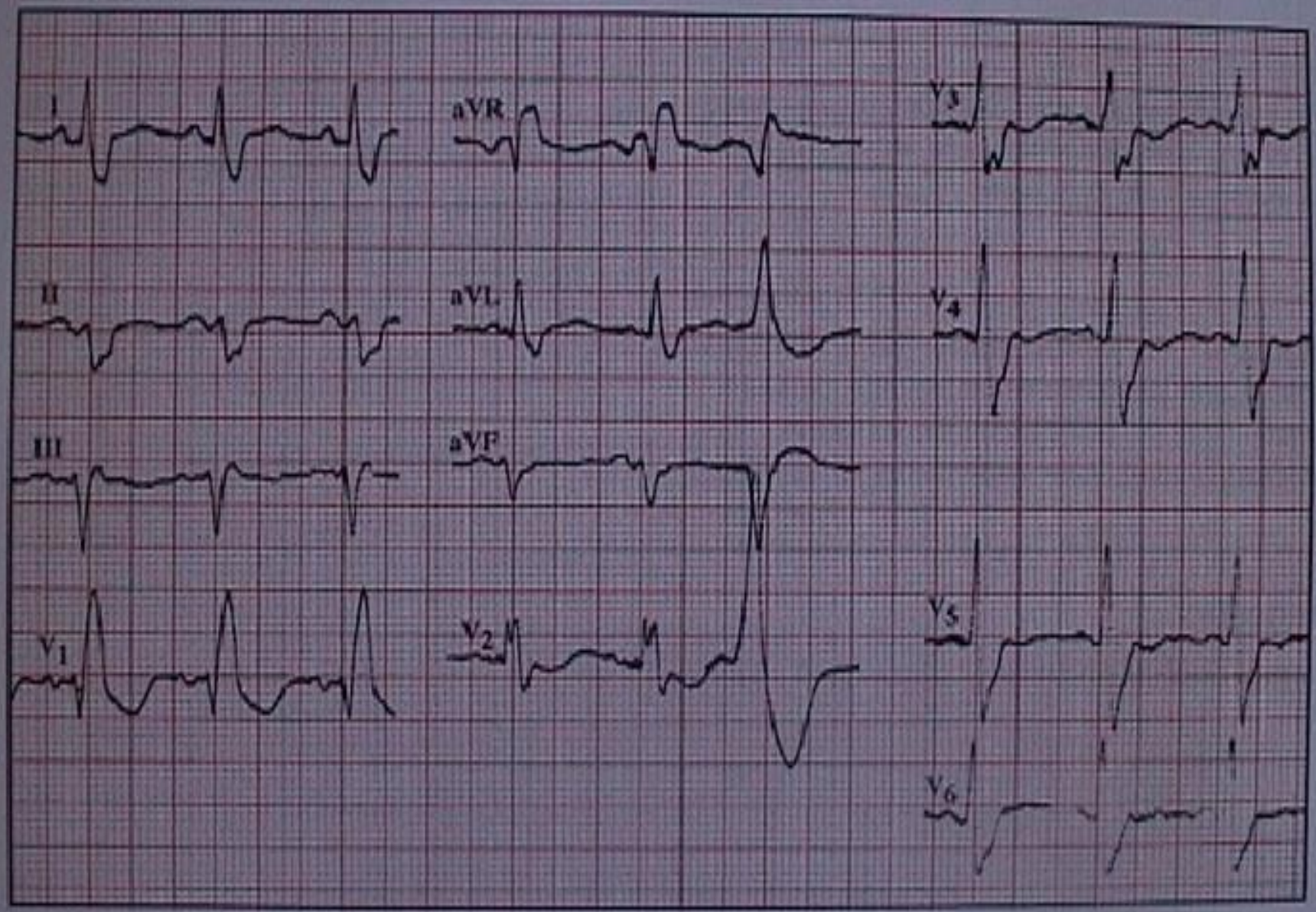
Peco

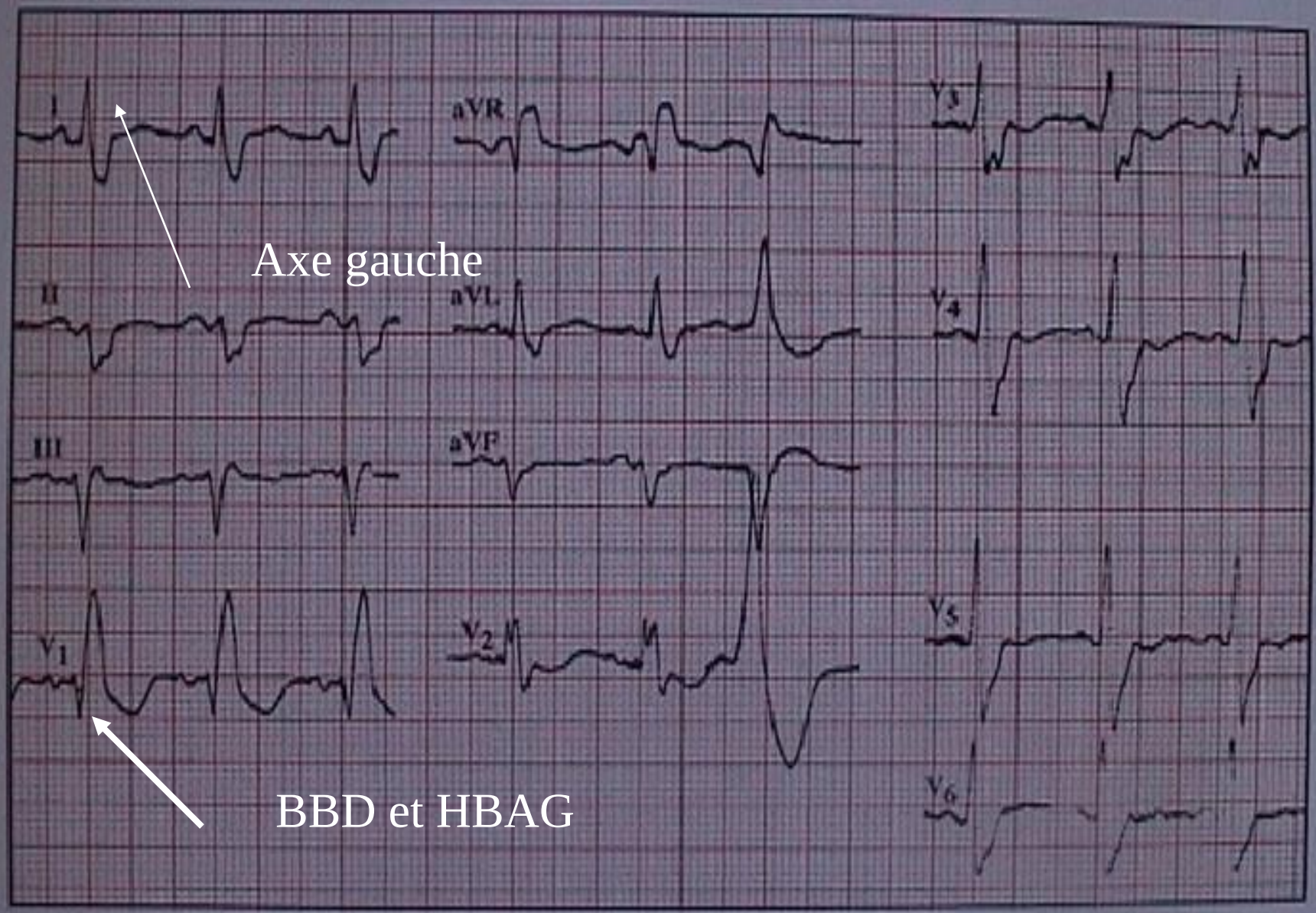


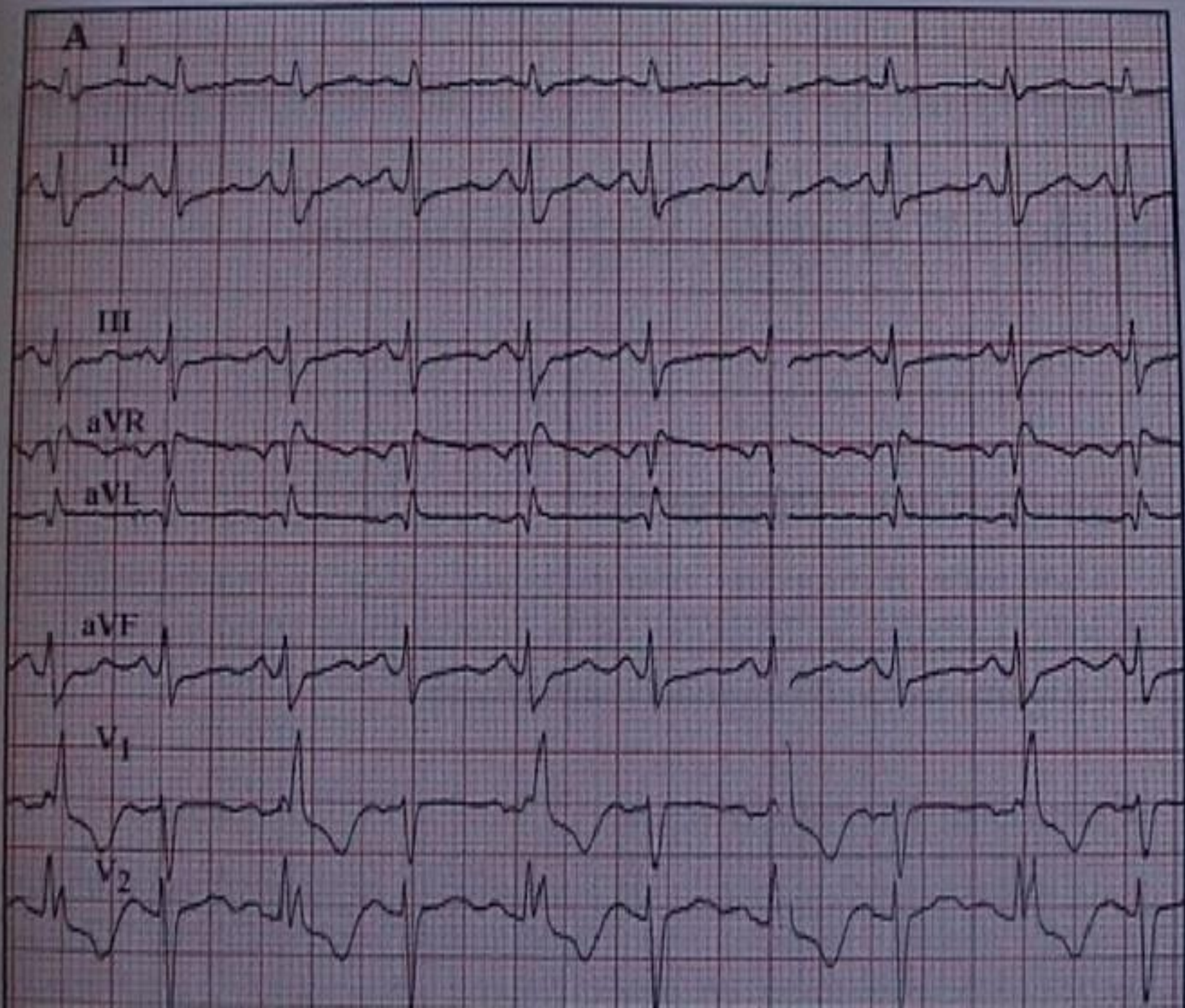

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
Bloc sino Auriculaire intermittent
P

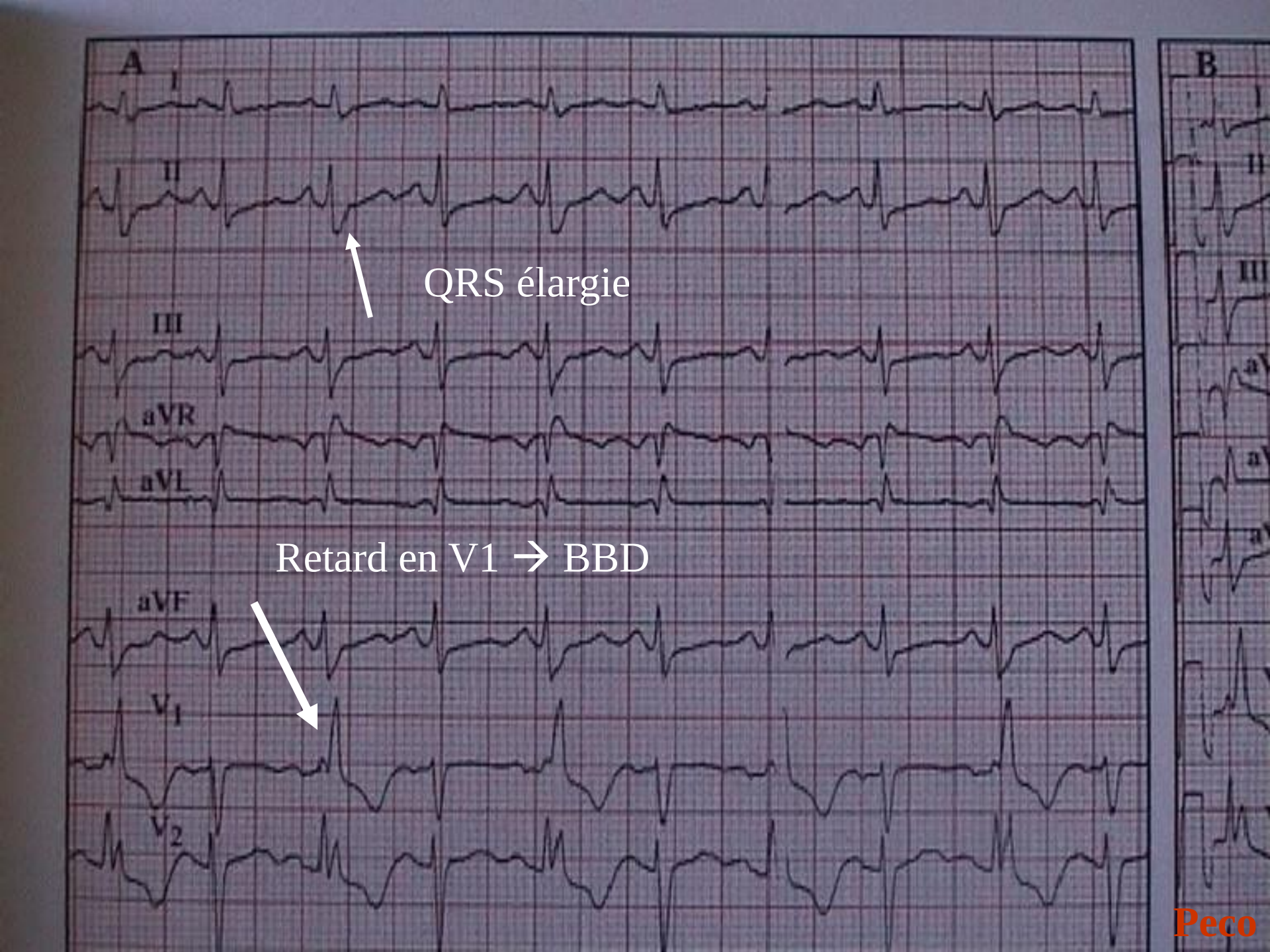


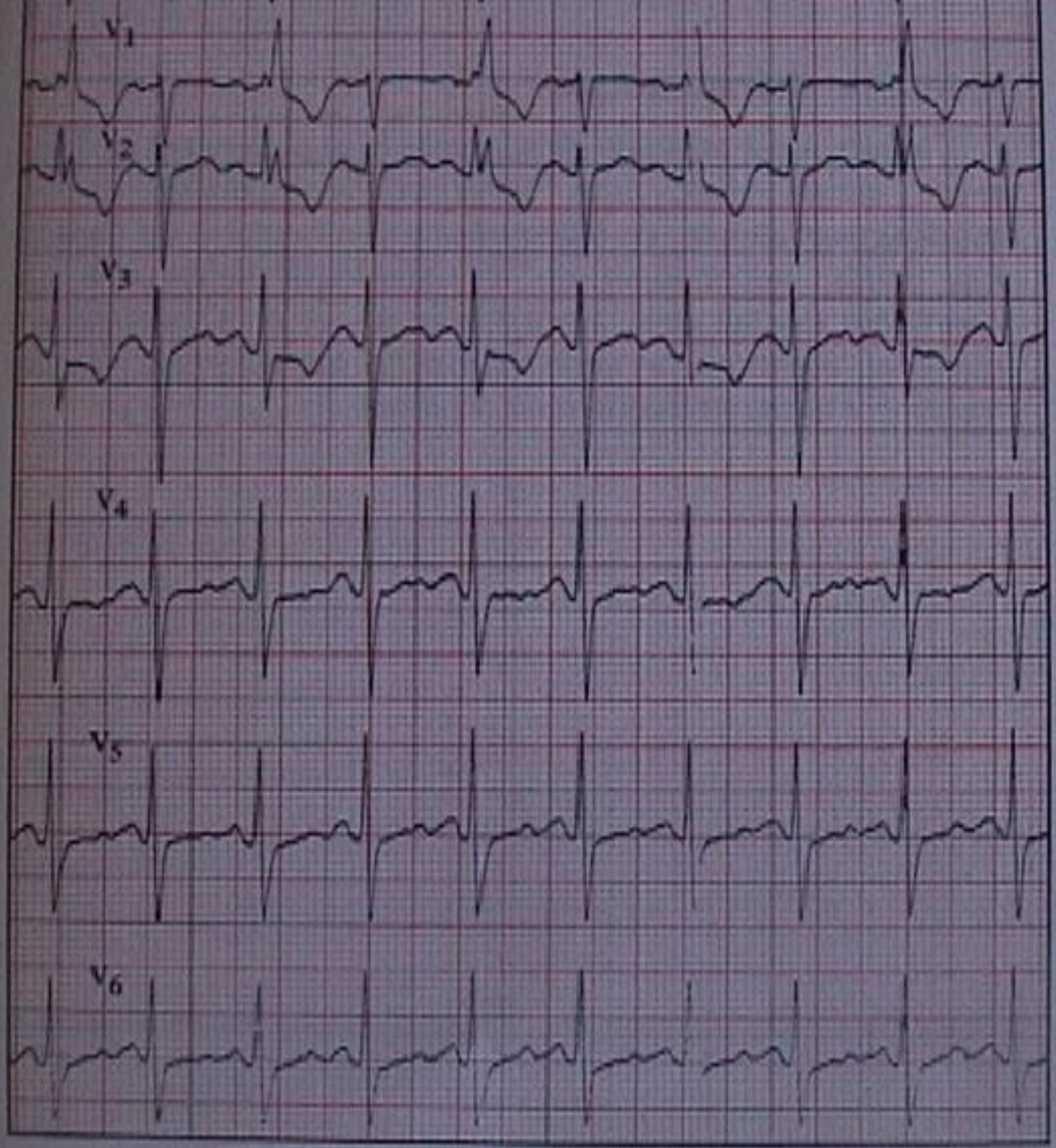


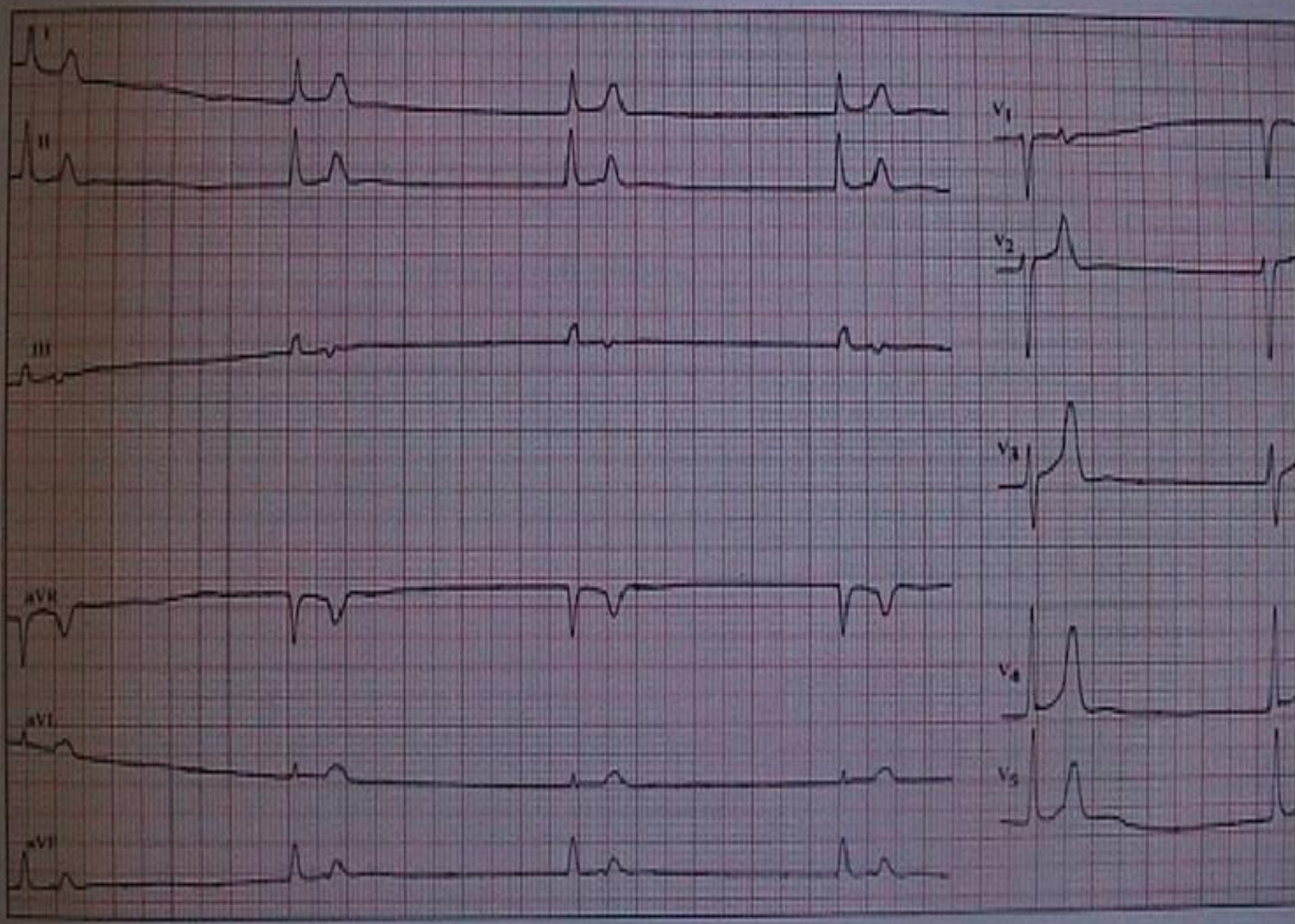


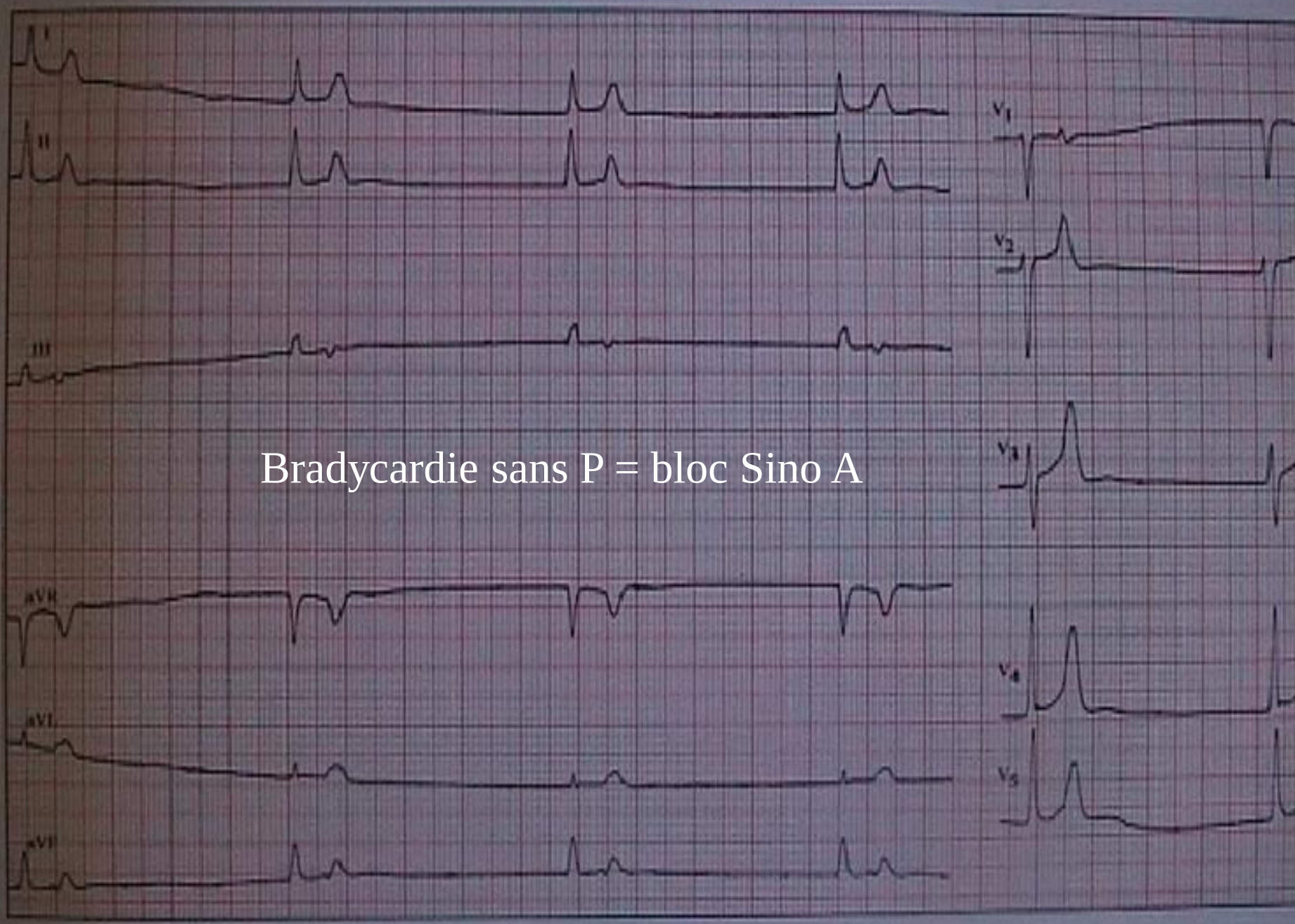



A
I
II
III
aVR
aVL
aVF
V1
V2
B
I
II
III

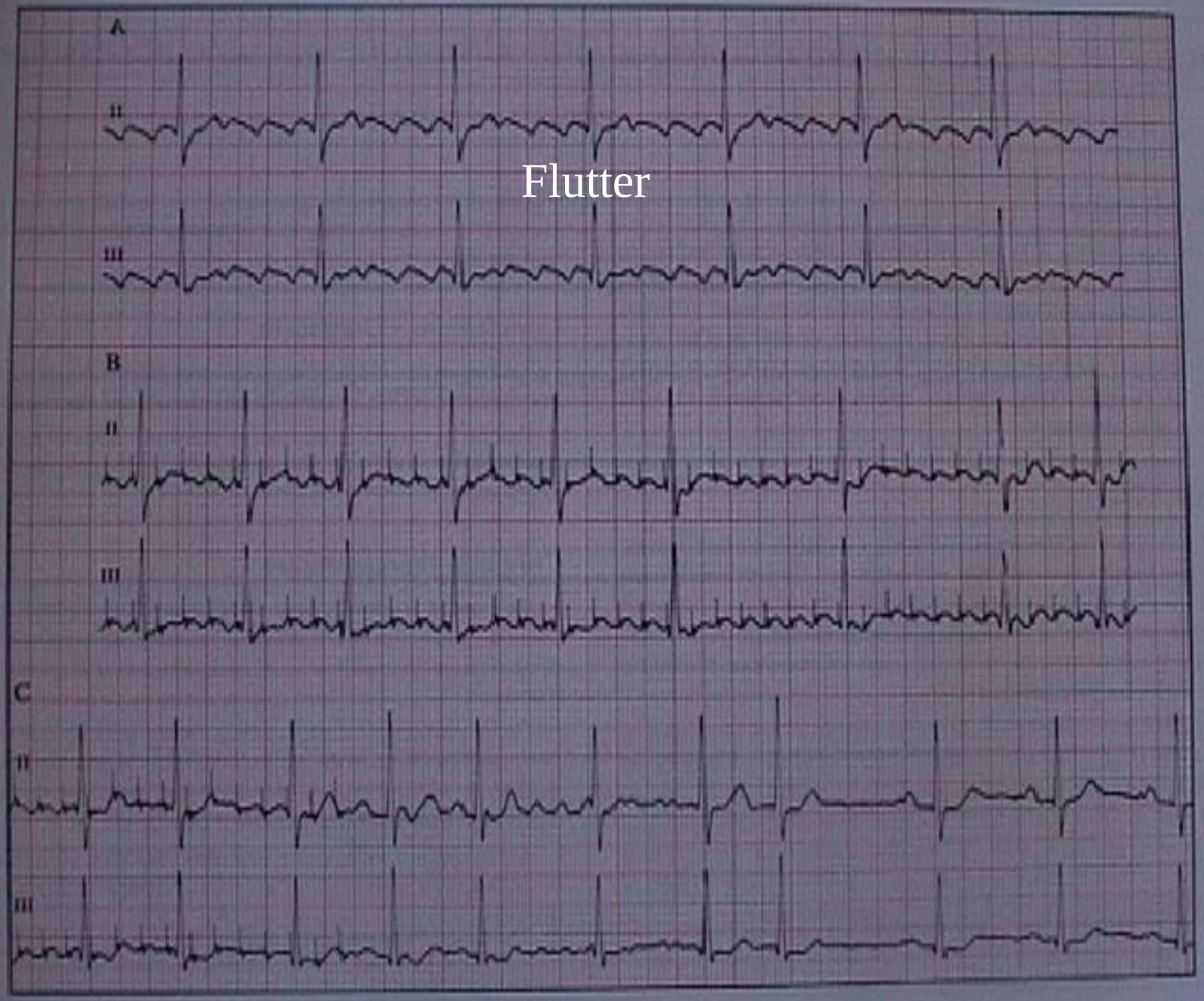

A
I
II
III
aVR
aVL
aVF
V1
V2
B
QRS élargie
Retard en V1 → BBD


V1
V2
V3
V4
V5
V6



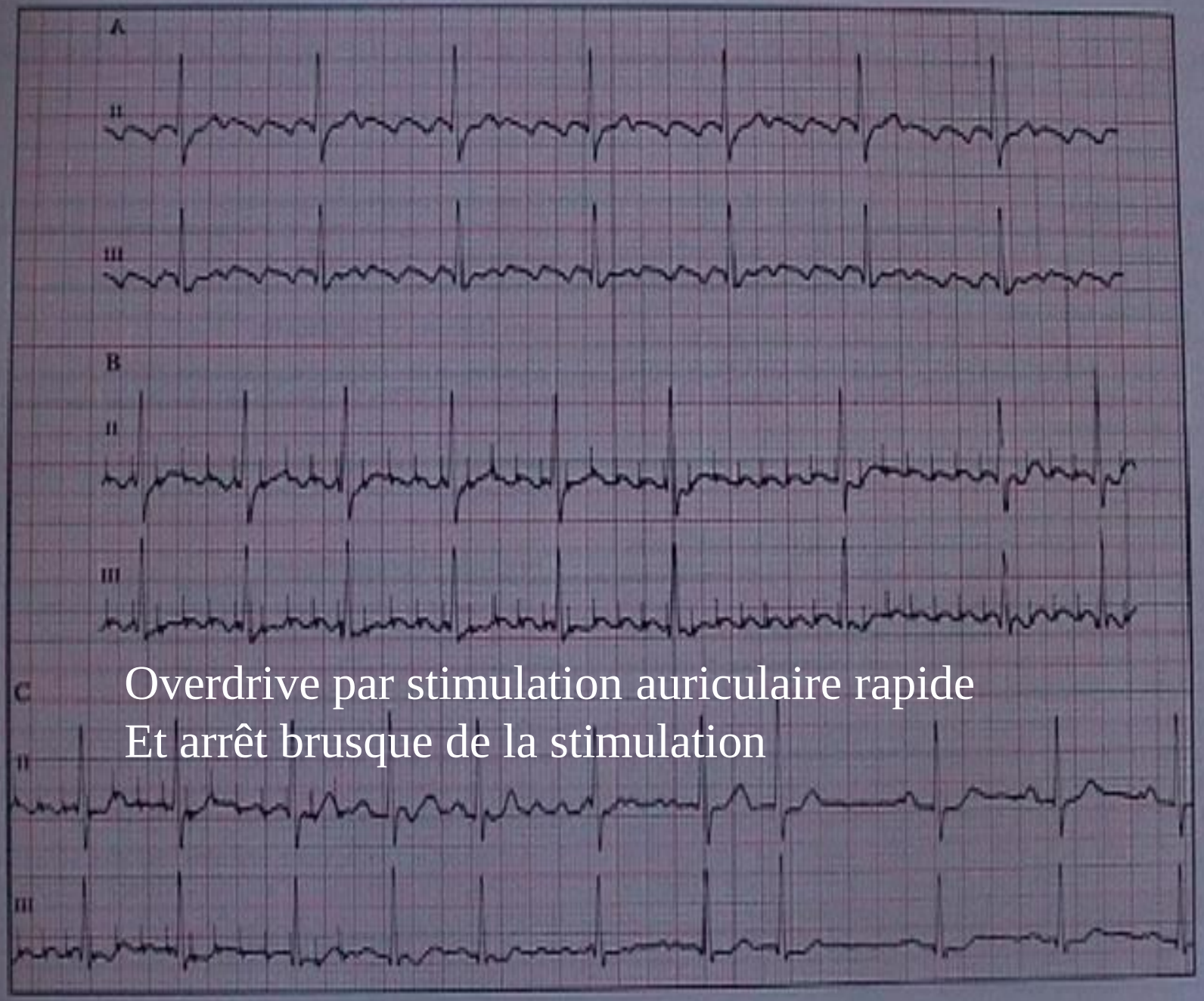


Bradycardie sans P = bloc Sino A

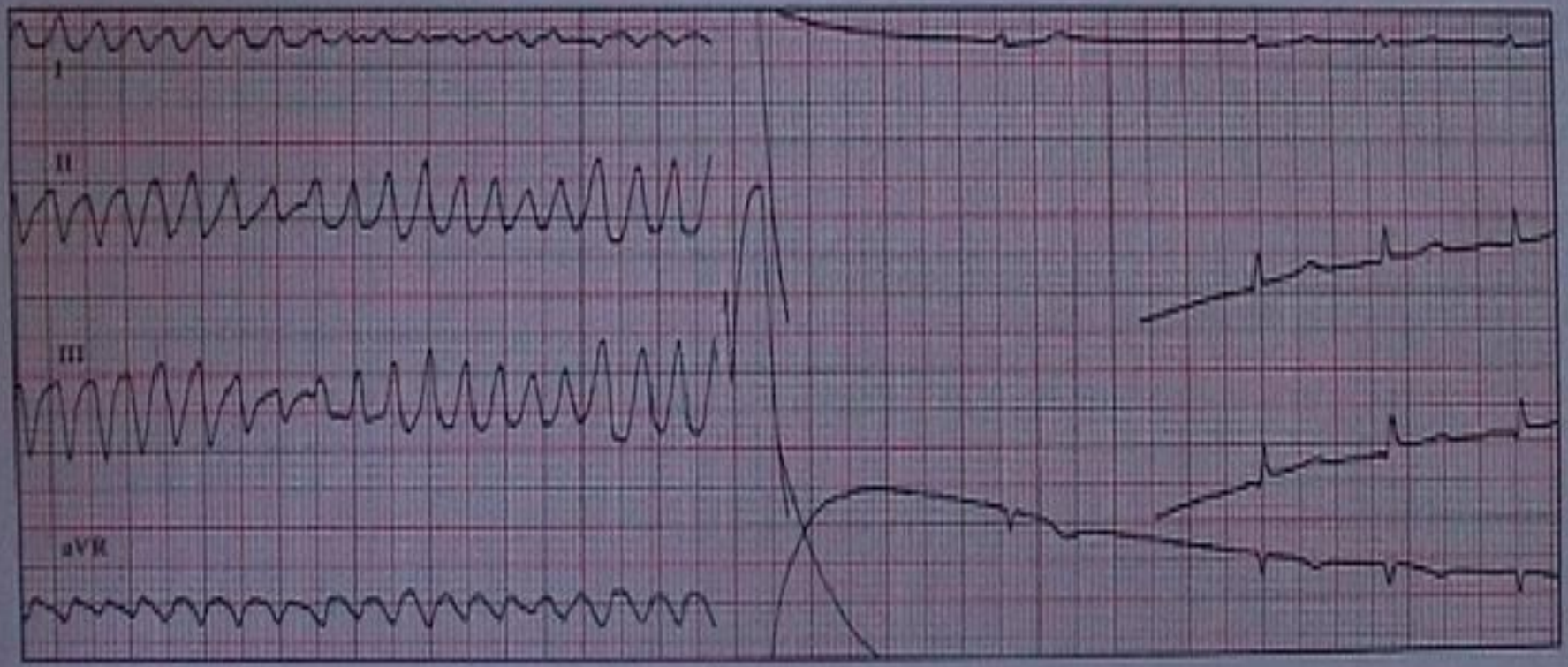


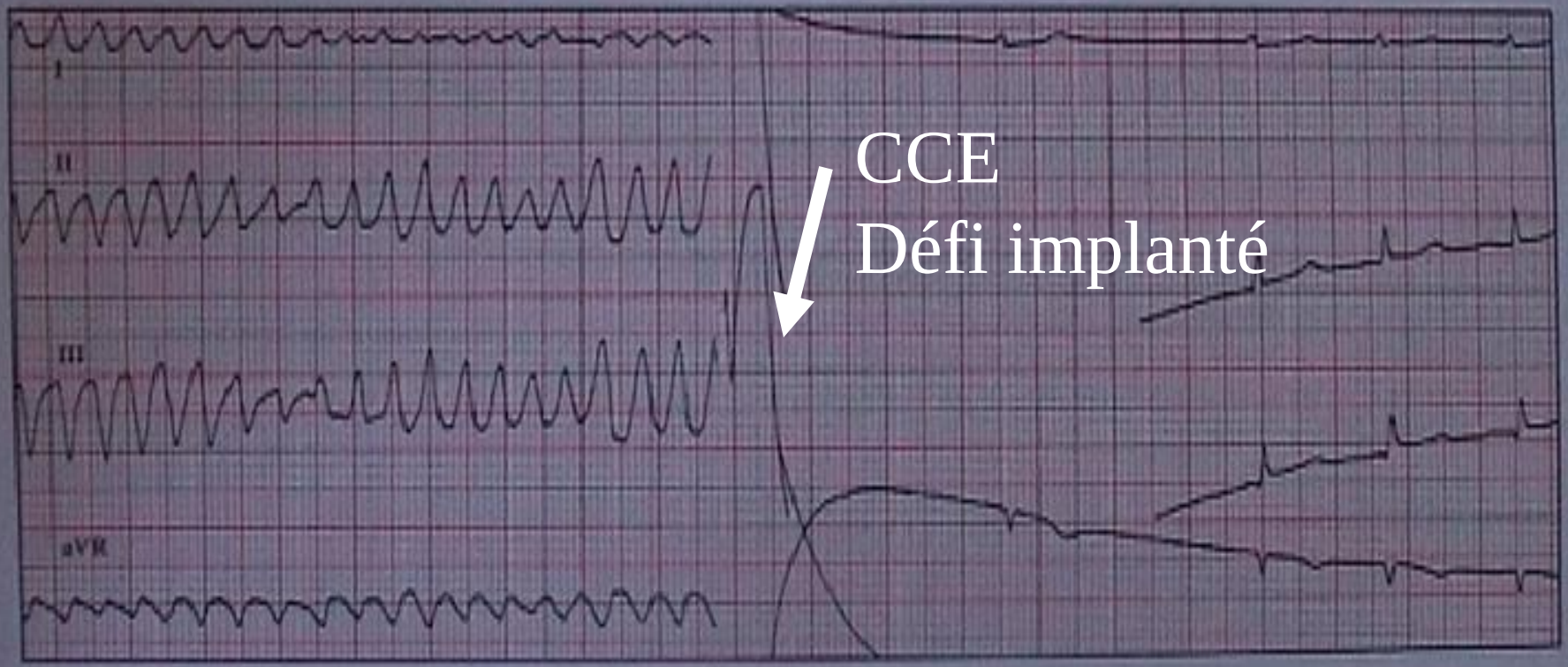
Flutter

Peco

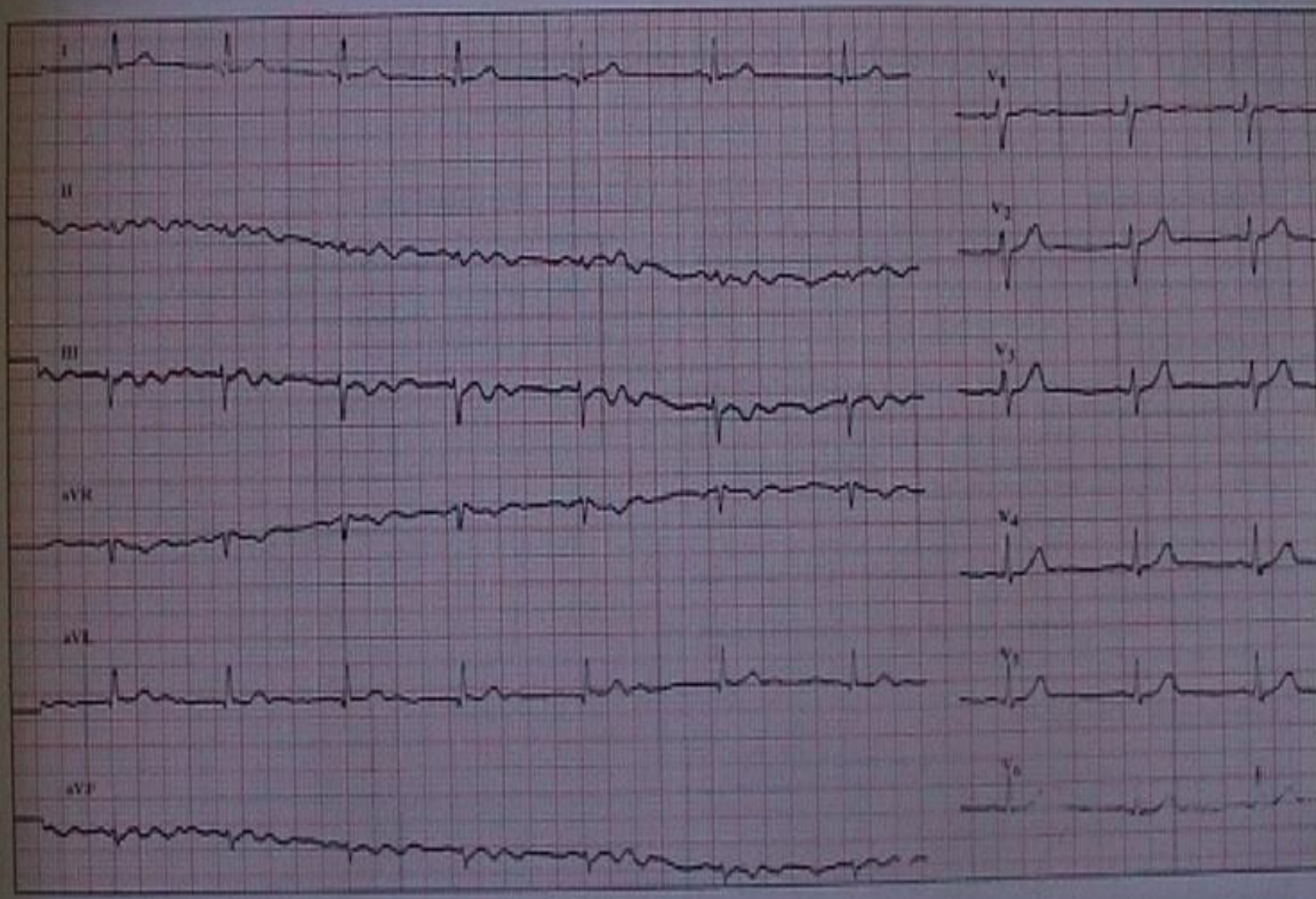


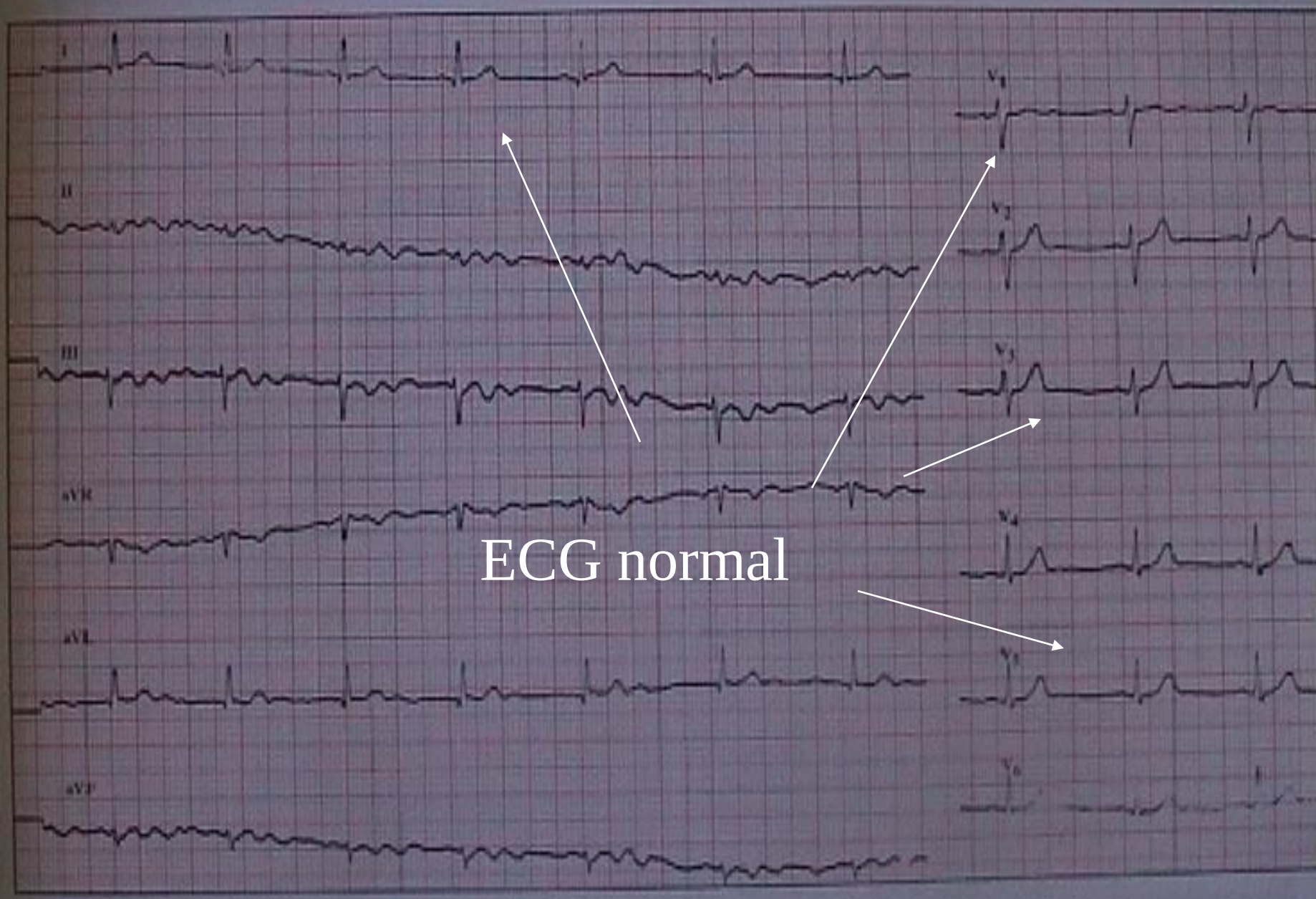
Overdrive par stimulation auriculaire rapide
Et arrêt brusque de la stimulation

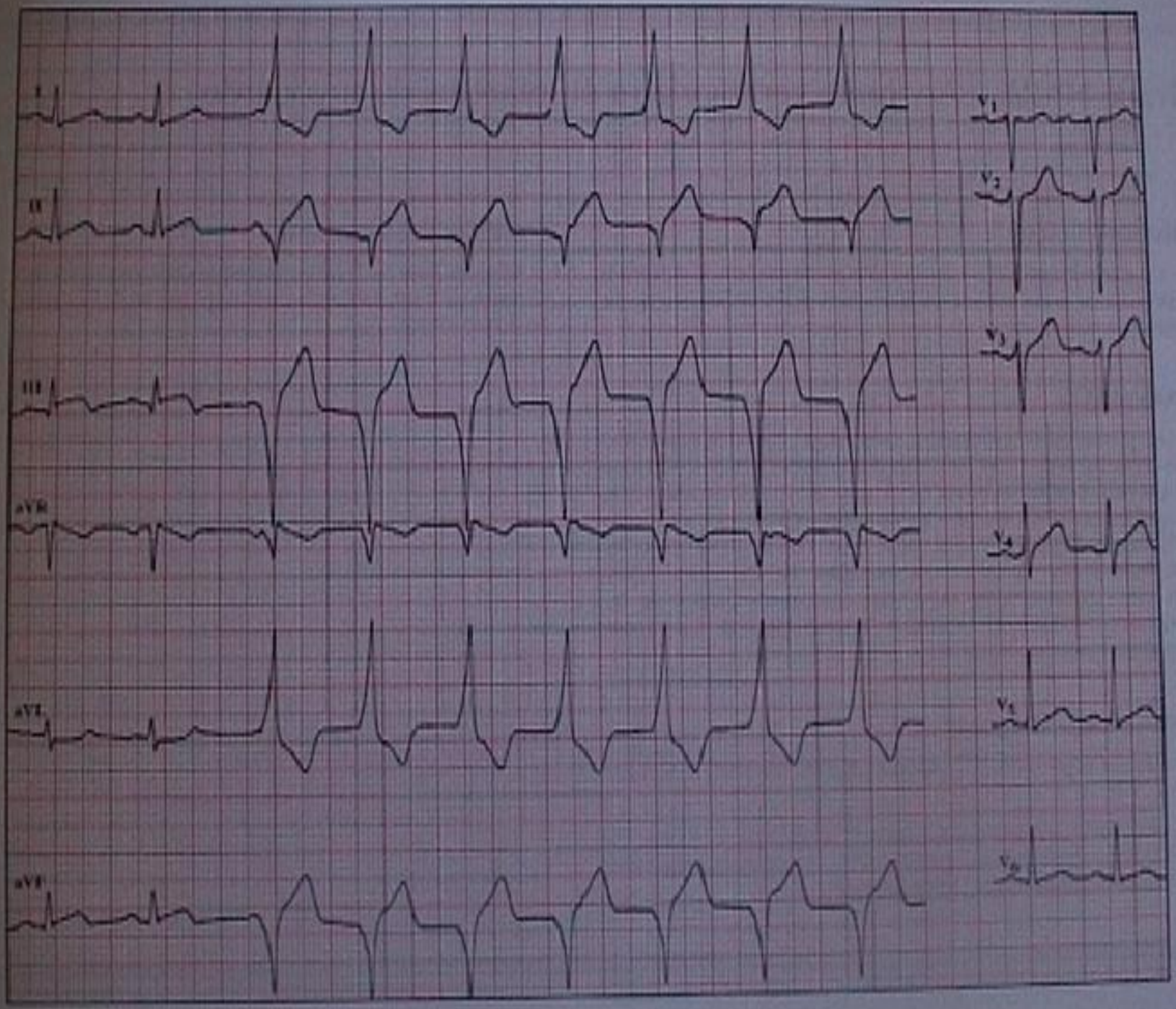




Peco







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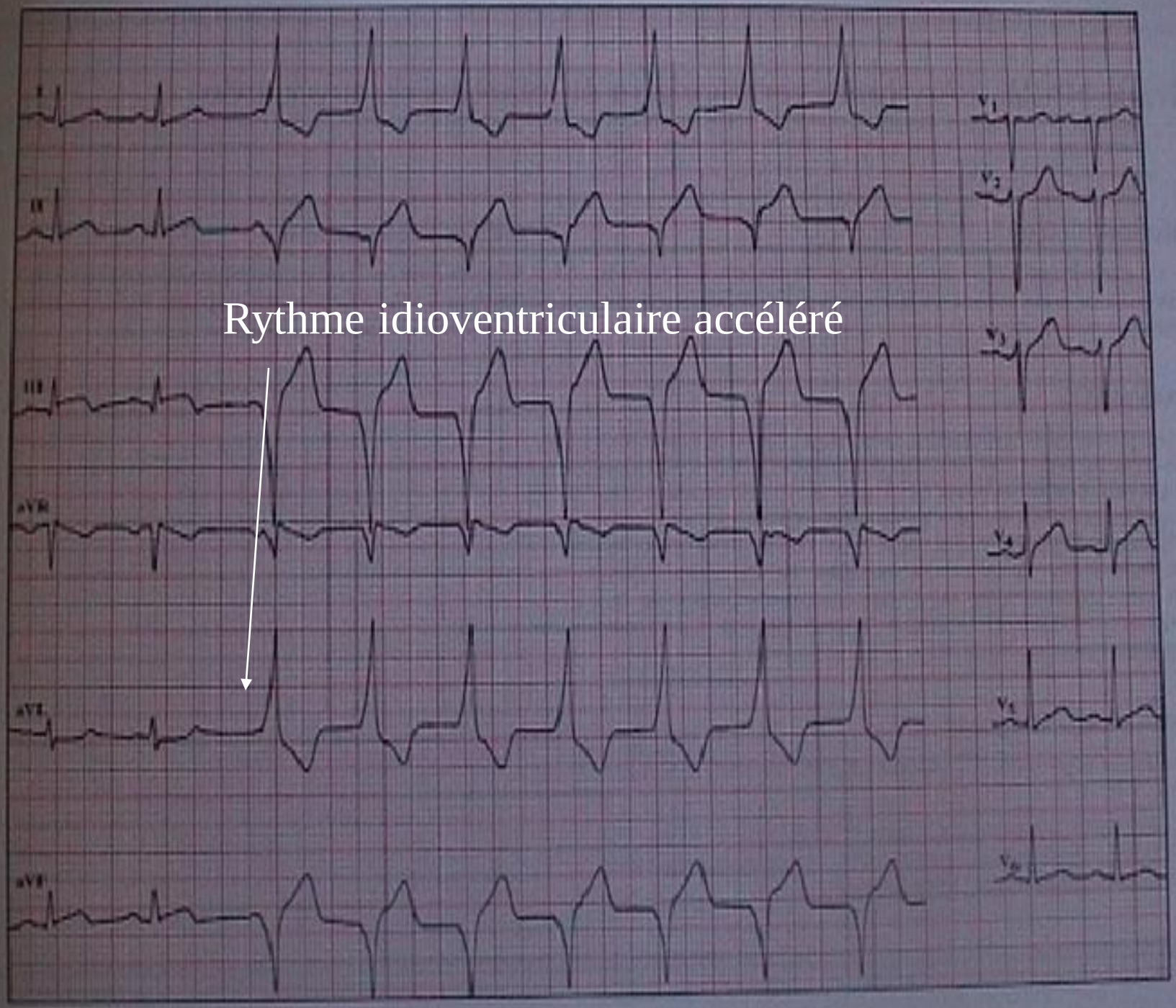

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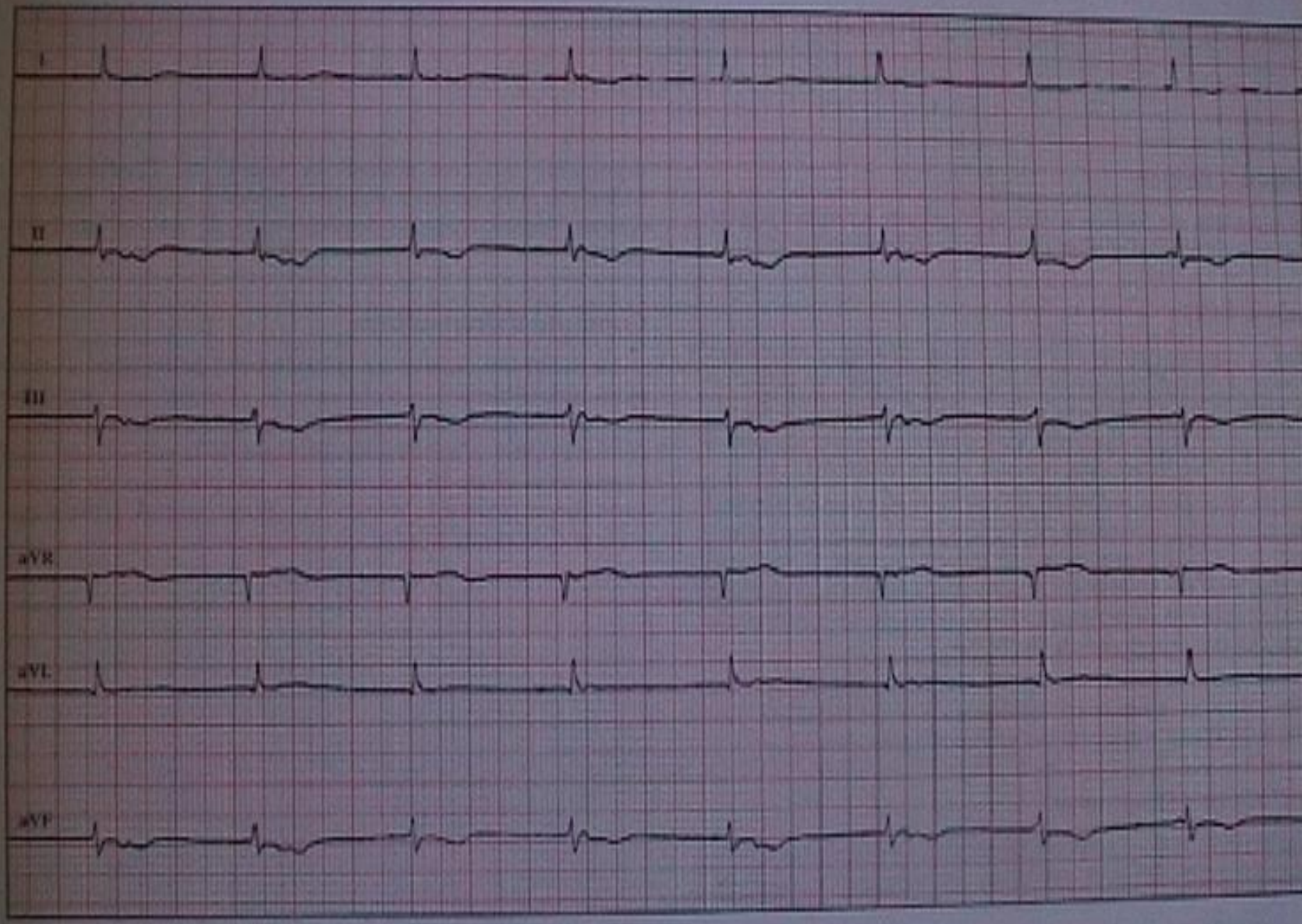
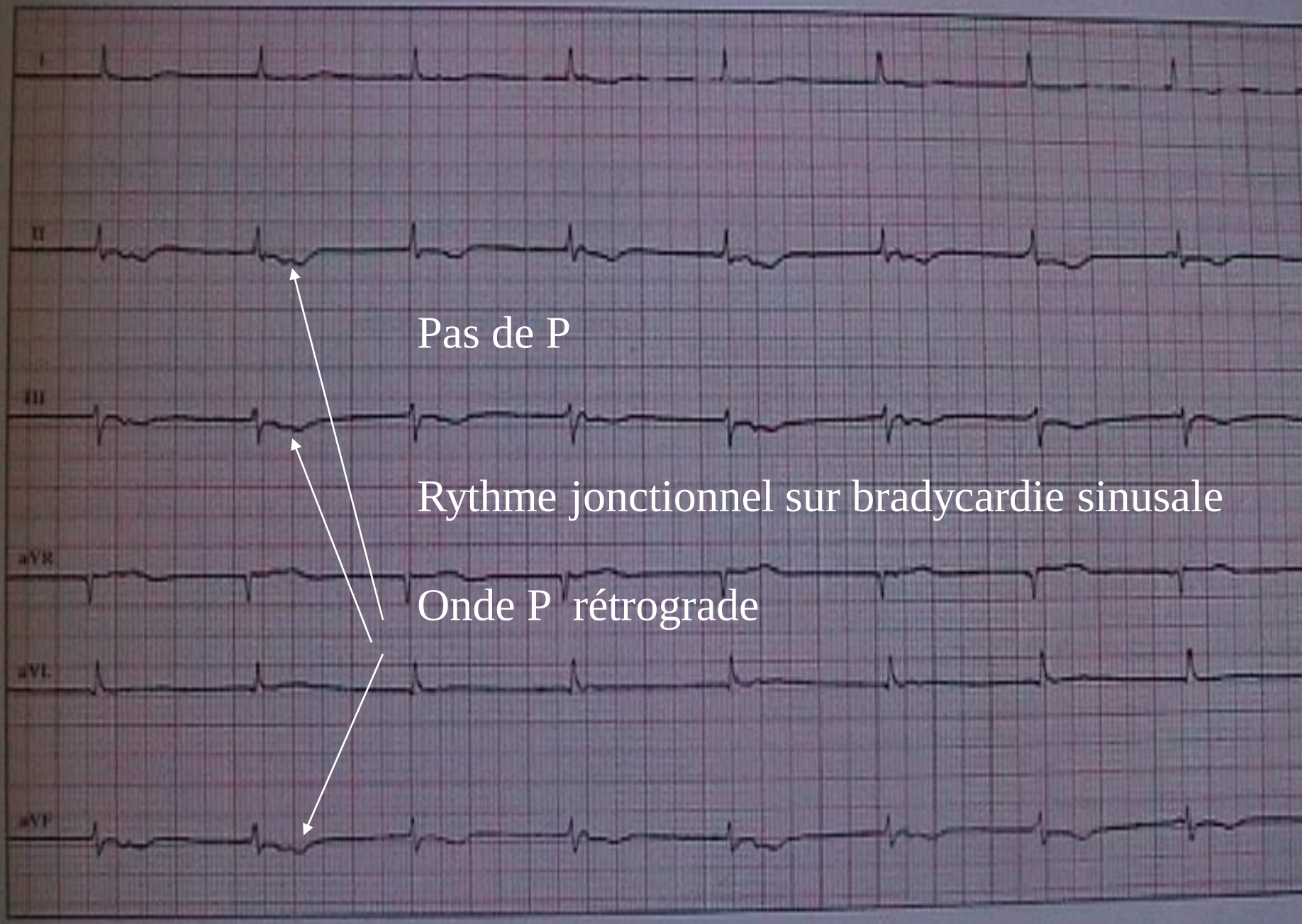
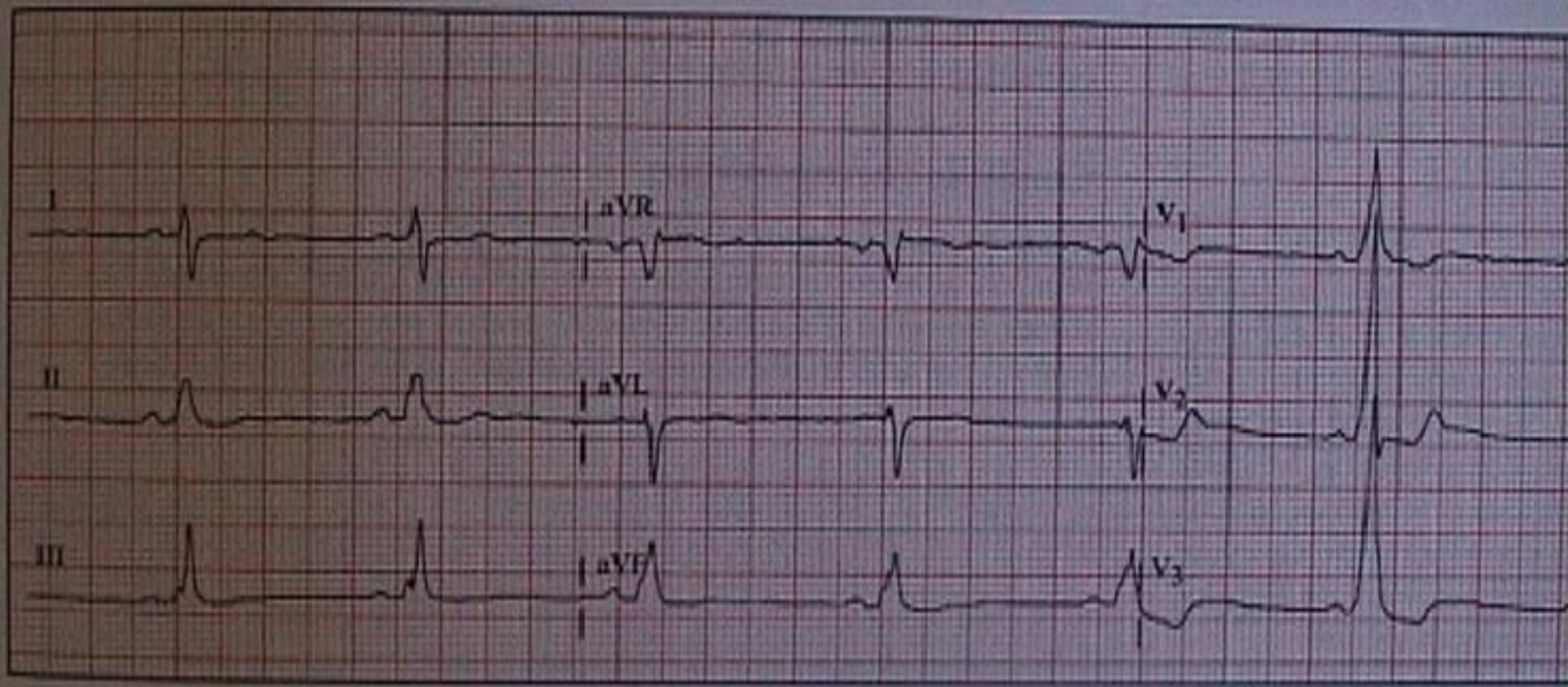
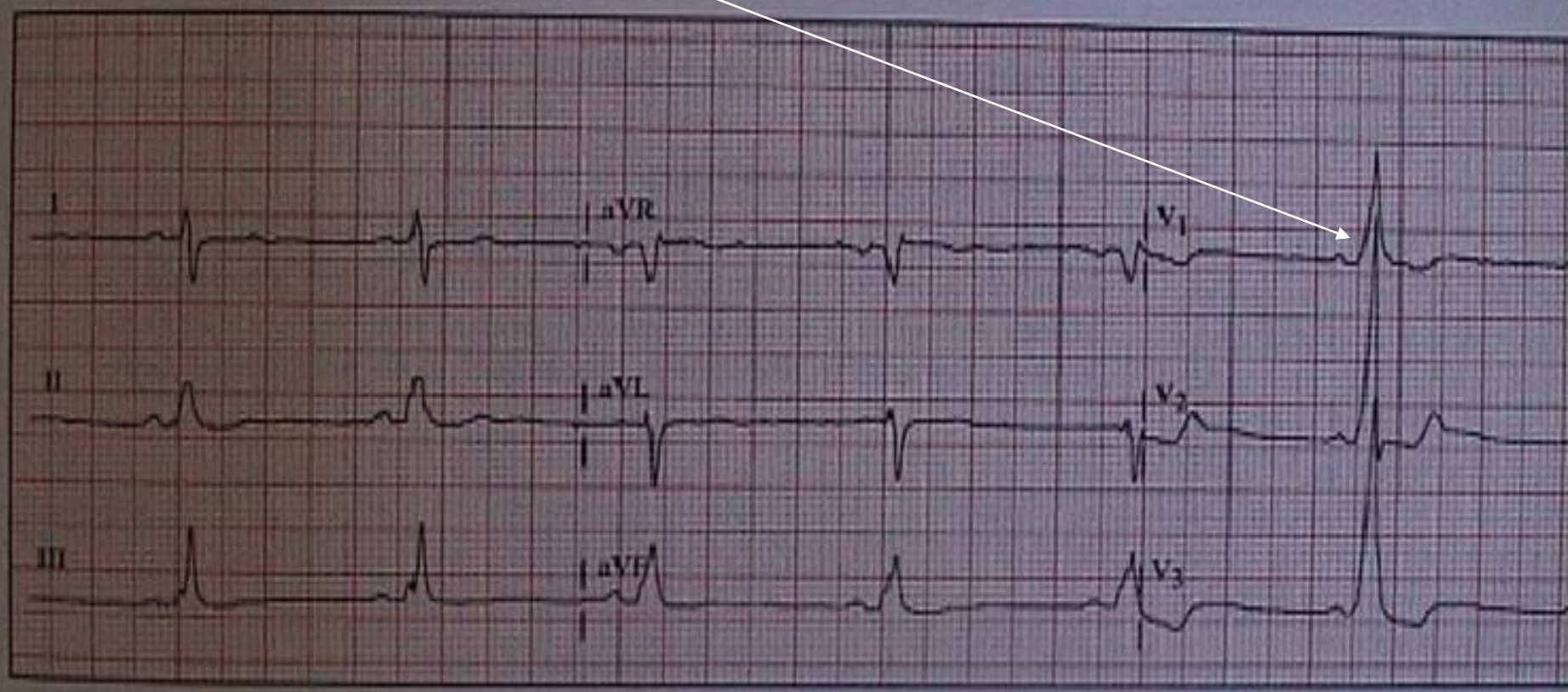



Pas de P
Rythme jonctionnel sur bradycardie sinusale
Onde P rétrograde

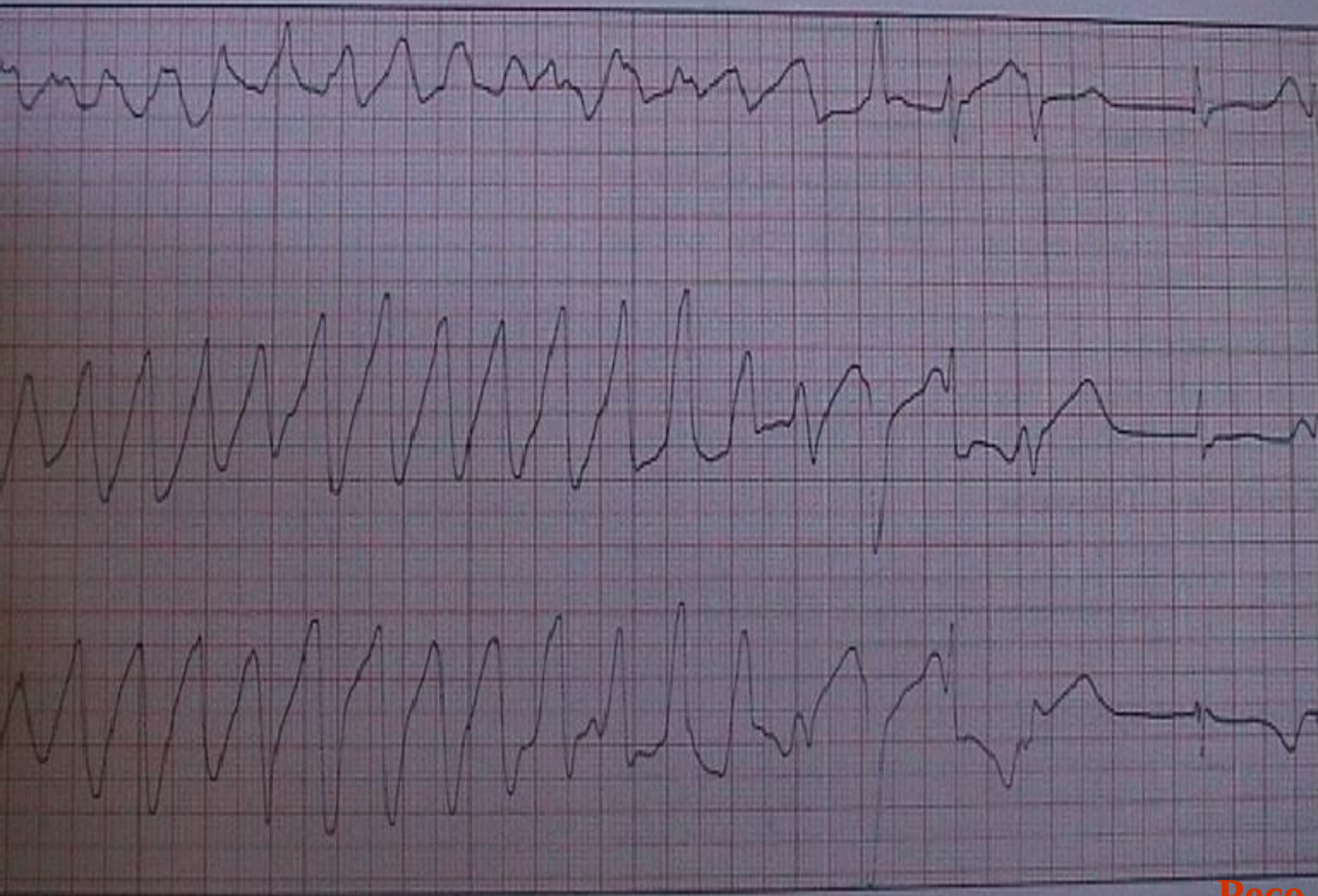
Peco

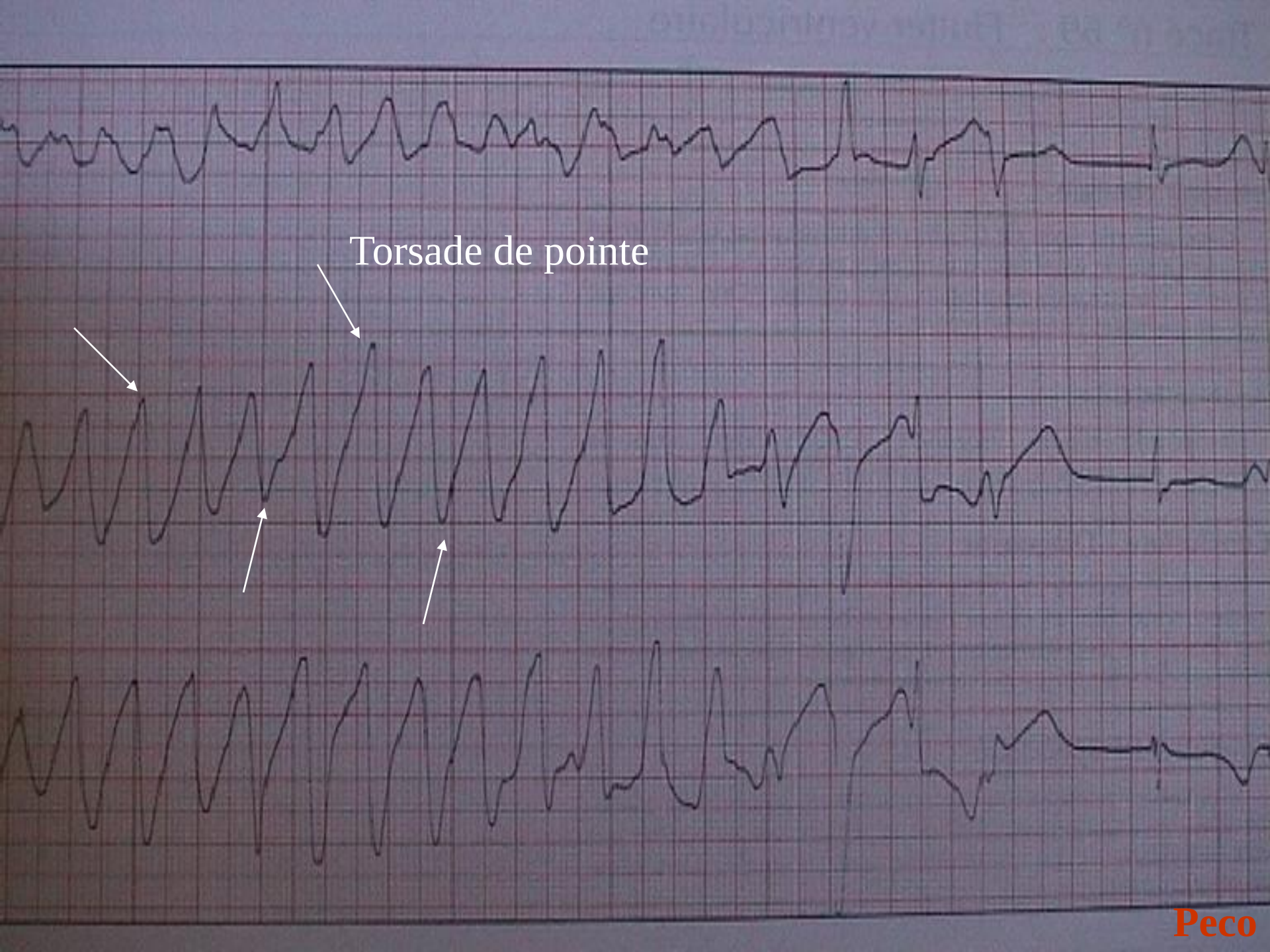


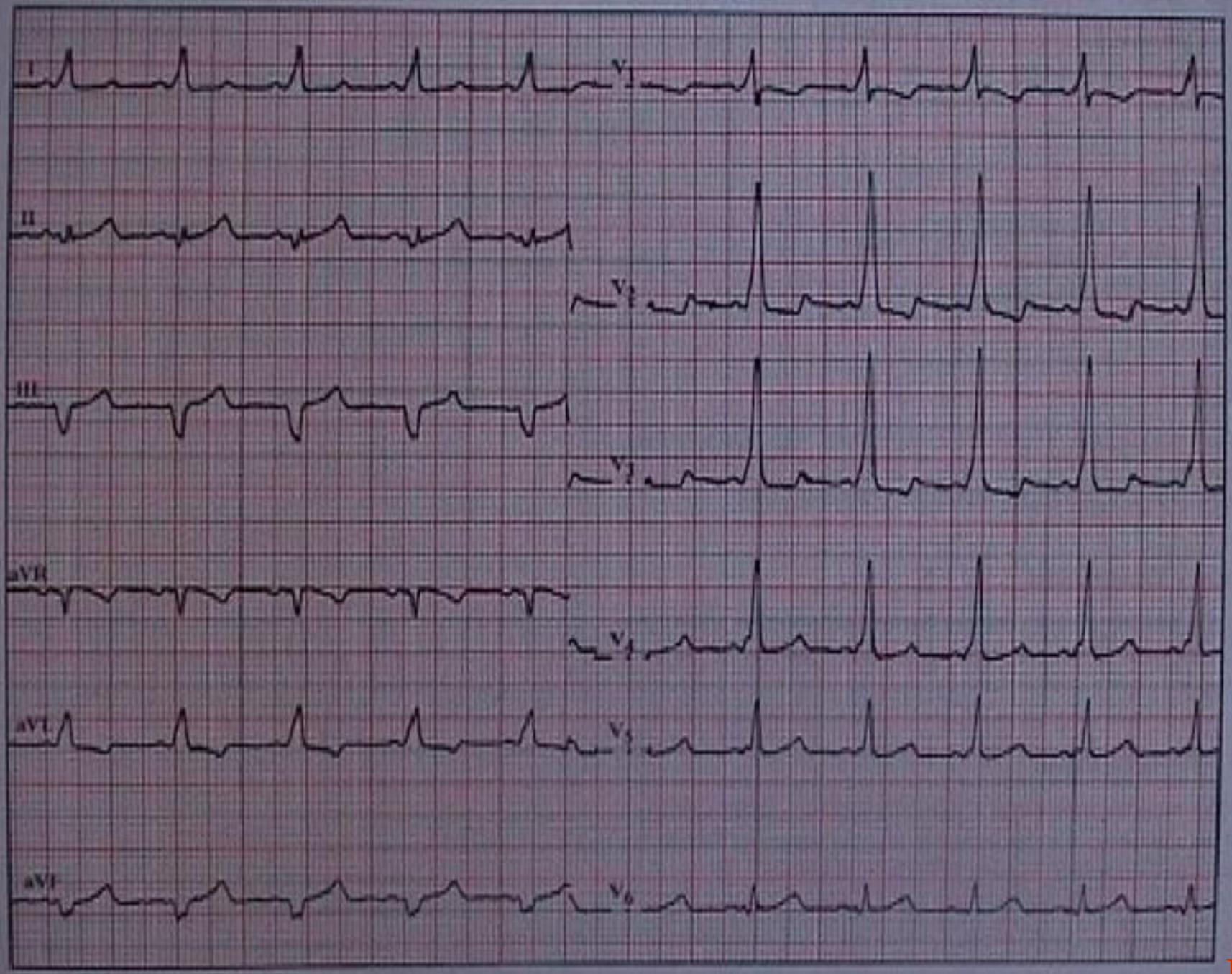
Pr court avec onde delta



Wolff parkinson White


Peco





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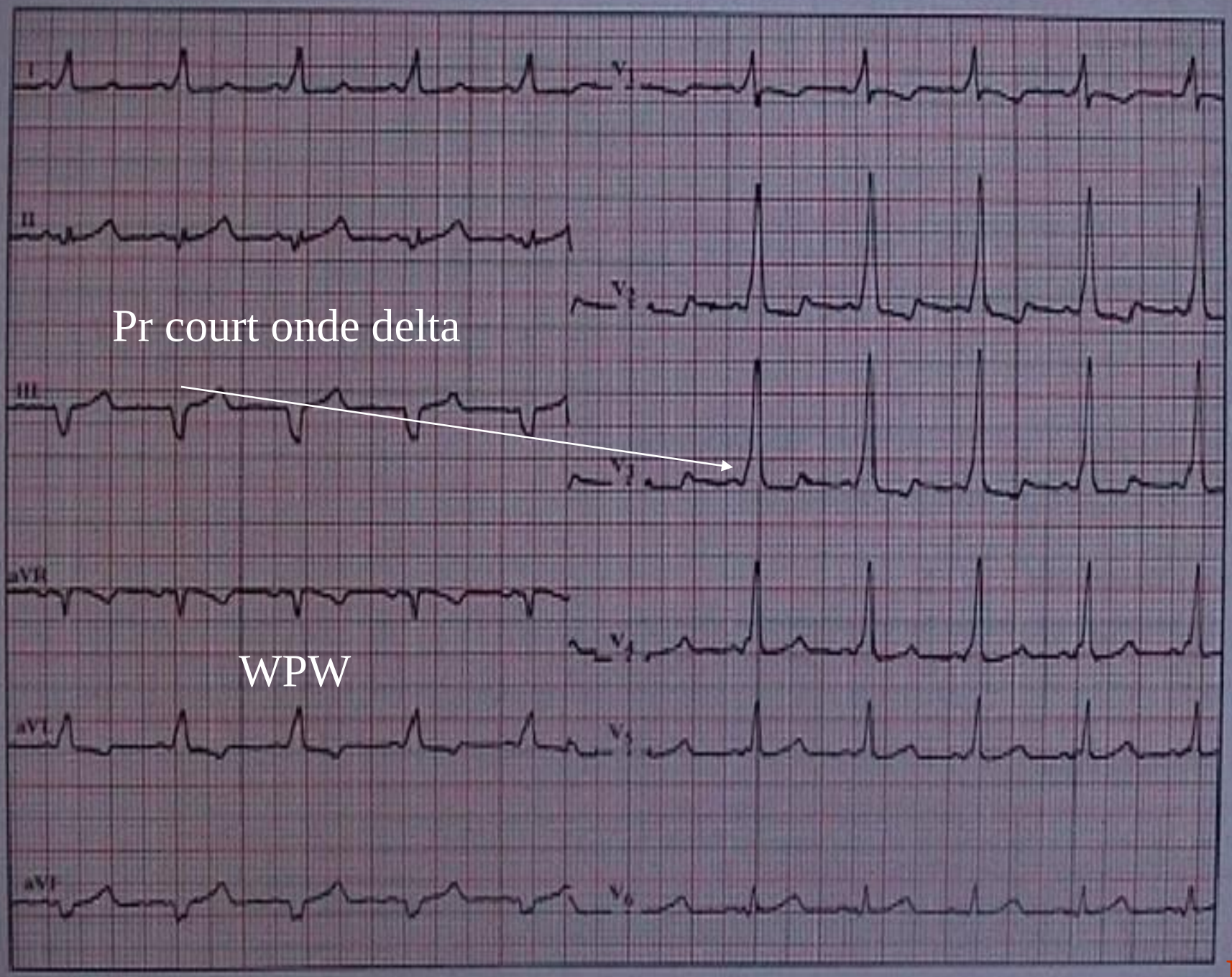

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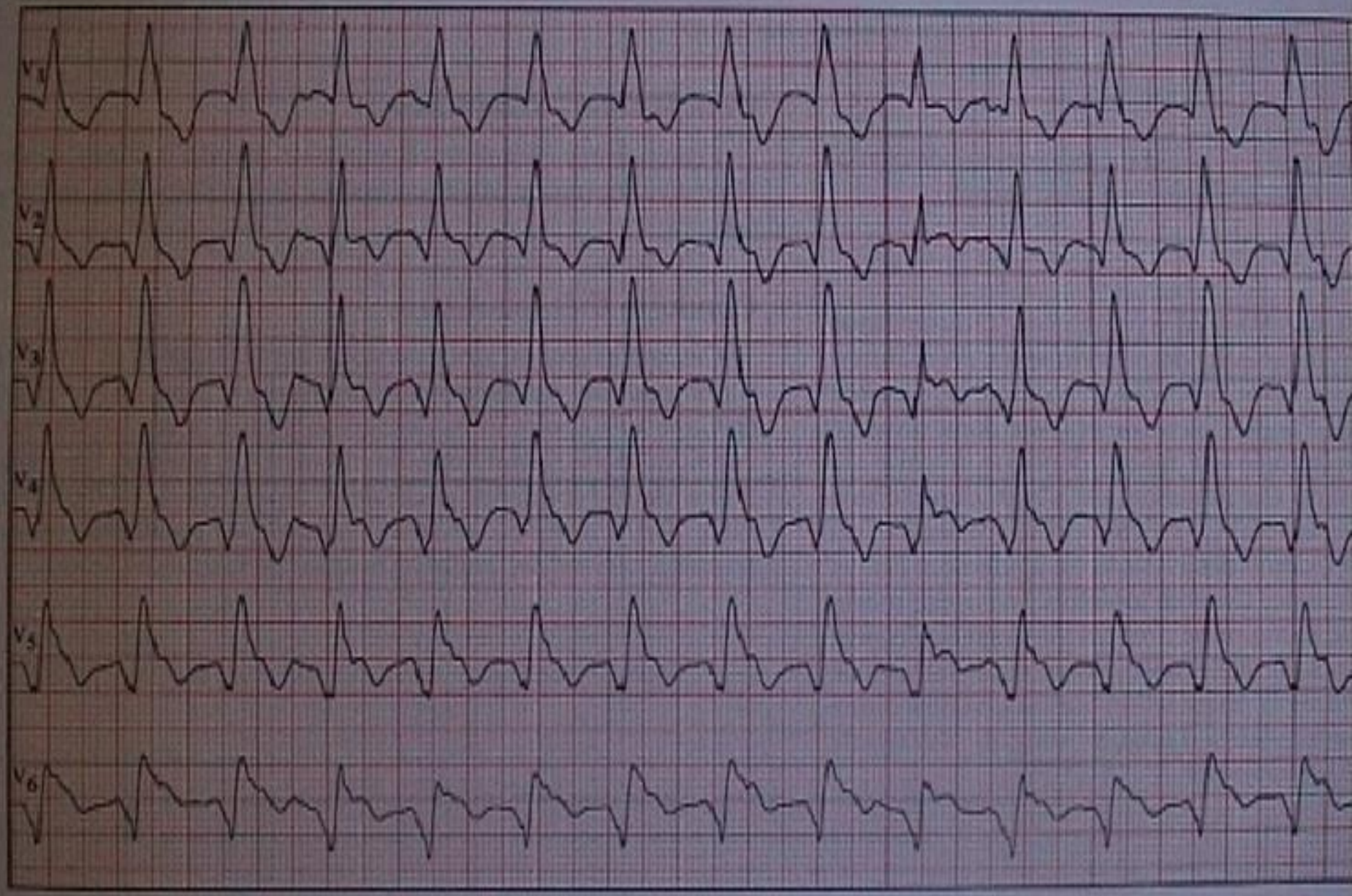

Peco