

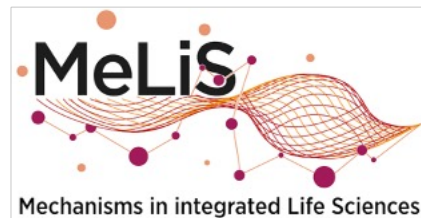


ELECTROCARDIOGRAMME

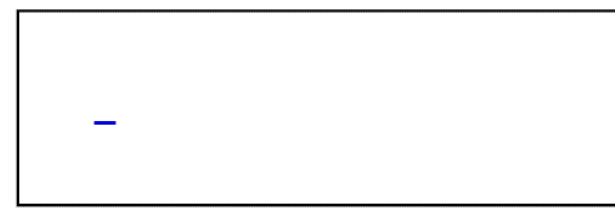
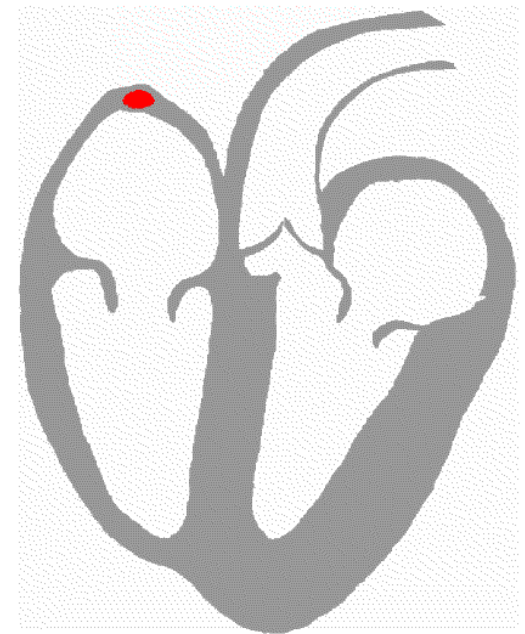
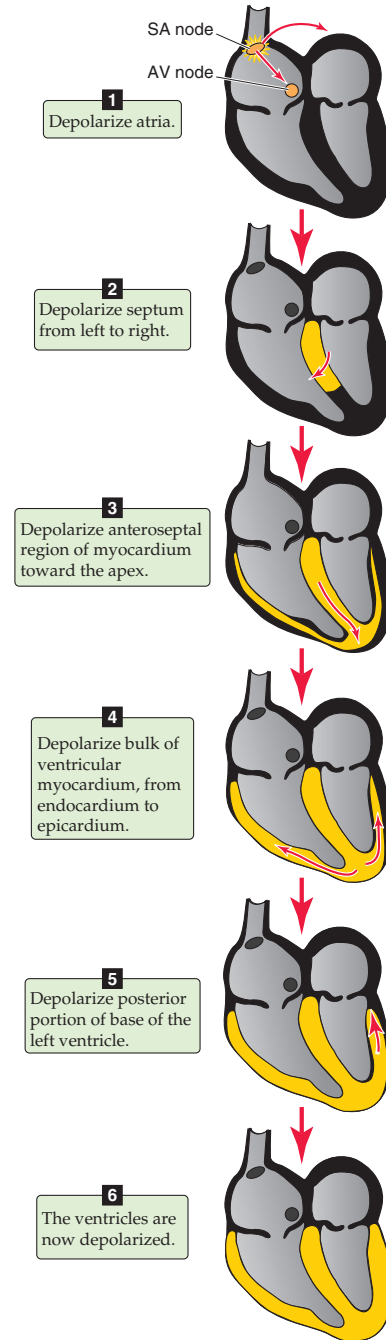
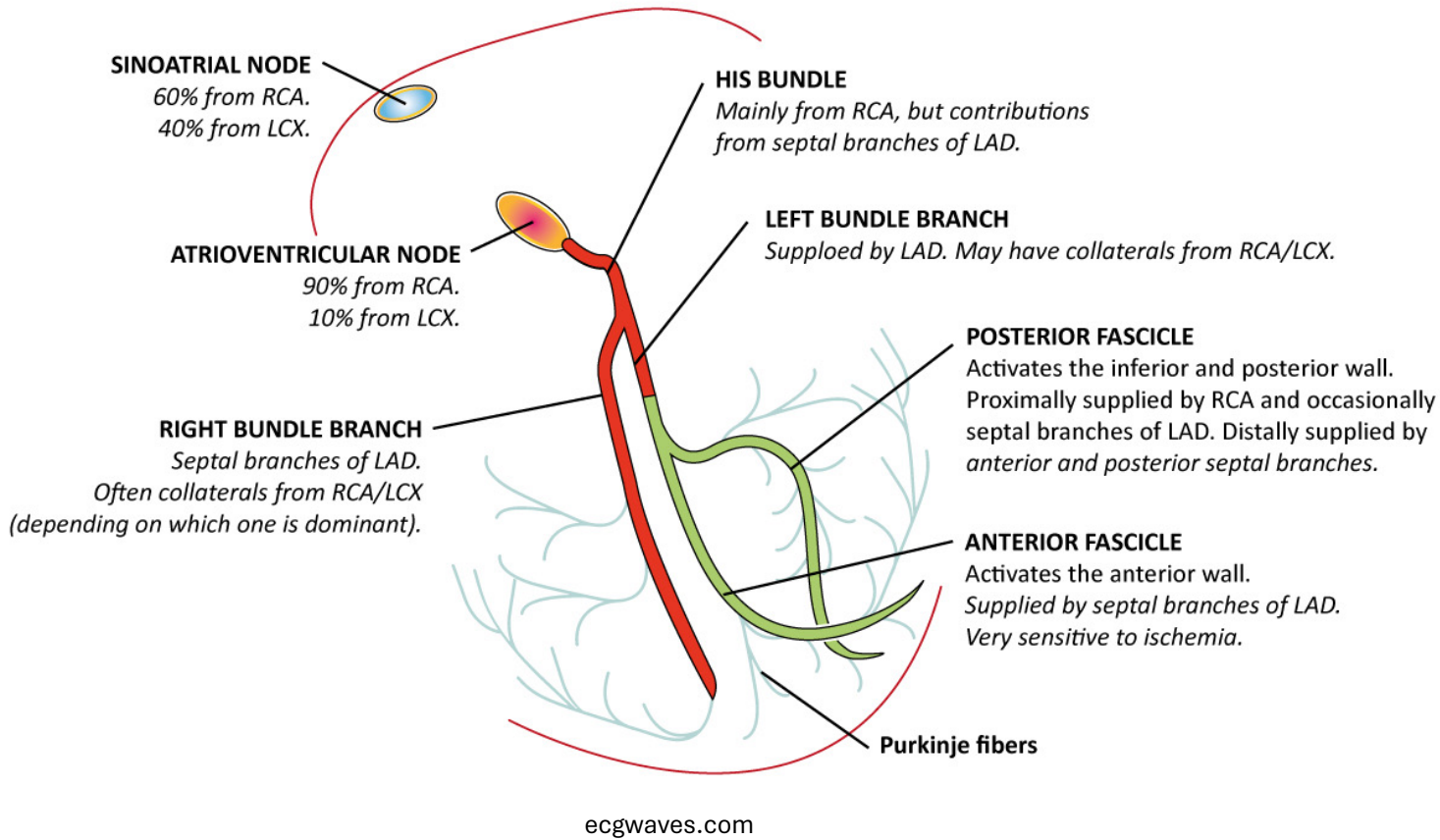
TROUBLES CONDUCTIFS

Dr Antoine Delinière

- **Centre national de référence des troubles du rythme cardiaque d'origine héréditaire de Lyon (CERA)**
- **Service de Rythmologie du Pr CHEVALIER, Hôpital Cardiologique Louis Pradel, Hospices Civils de Lyon**
- **MeLiS, CNRS UMR 5284, INSERM U1314, Institut NeuroMyoGène, Université Claude Bernard Lyon I**

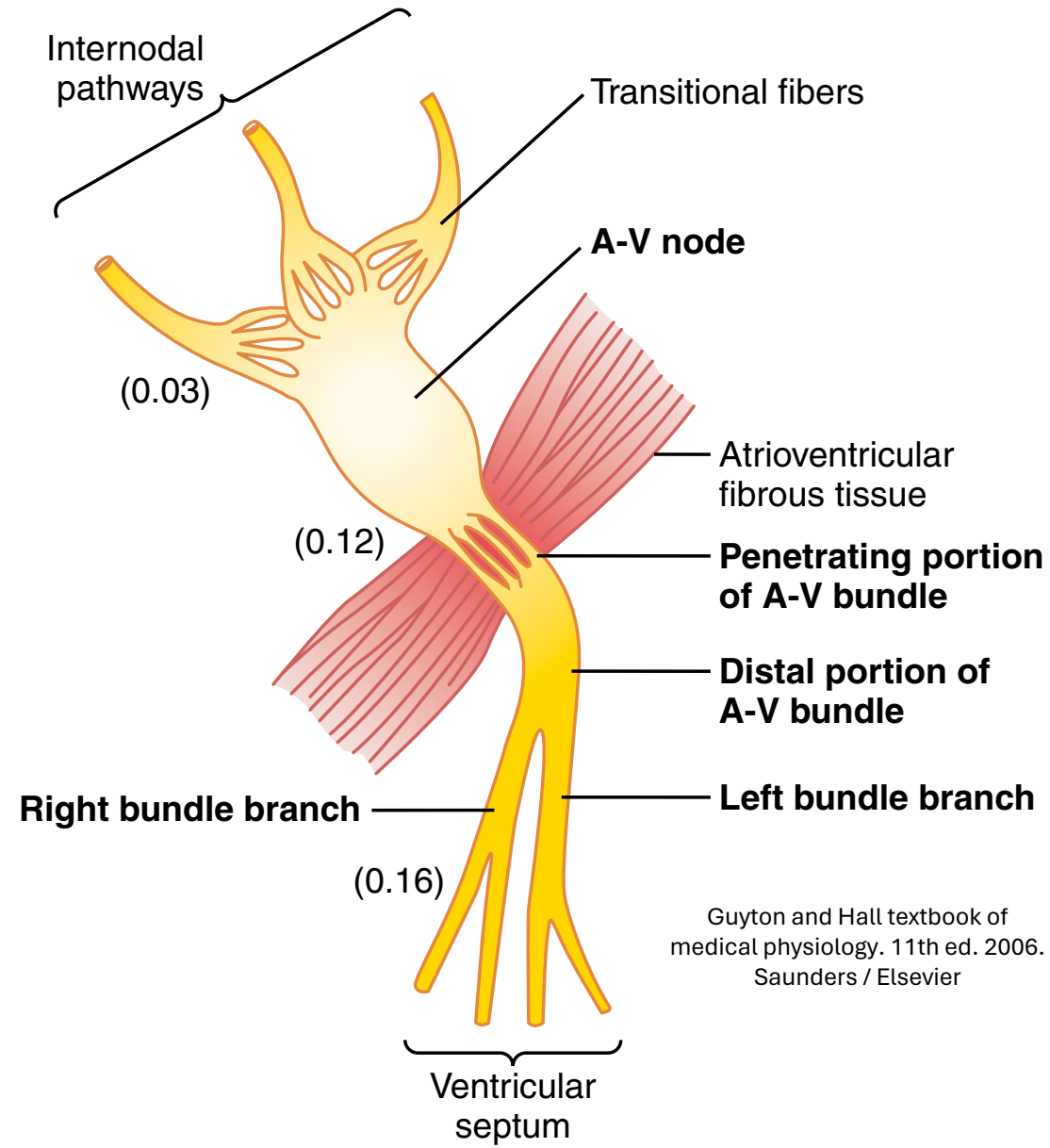
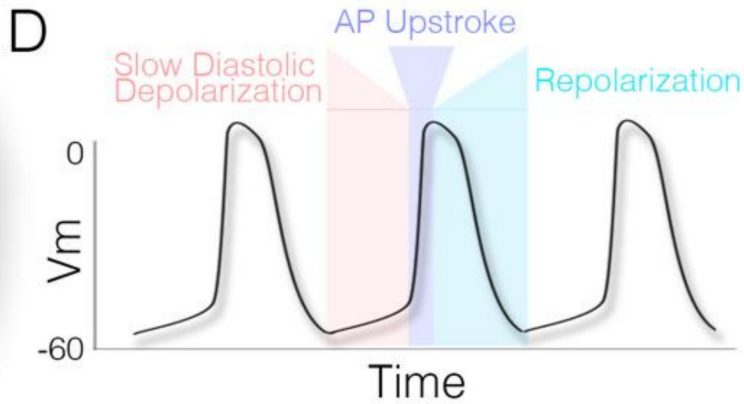
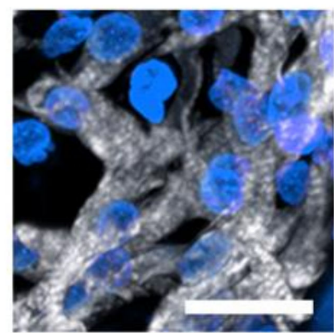
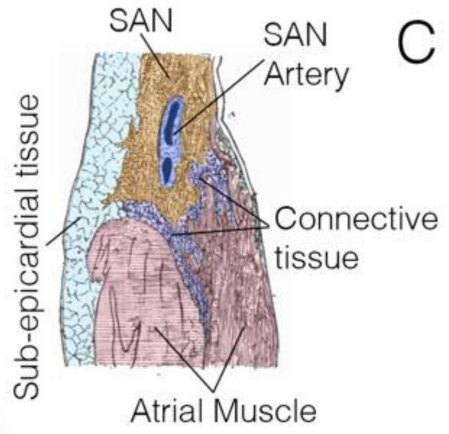
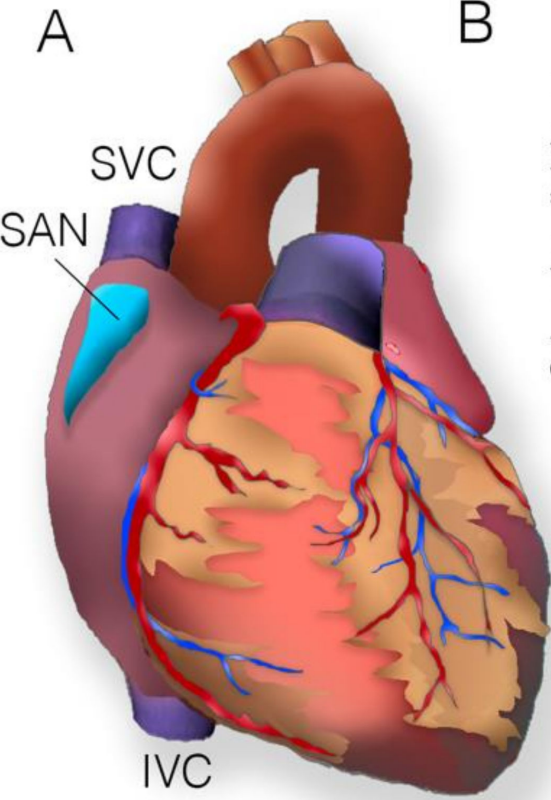


ANATOMIE & PHYSIOLOGIE DU CŒUR • TISSU NODAL & VOIES DE CONDUCTION



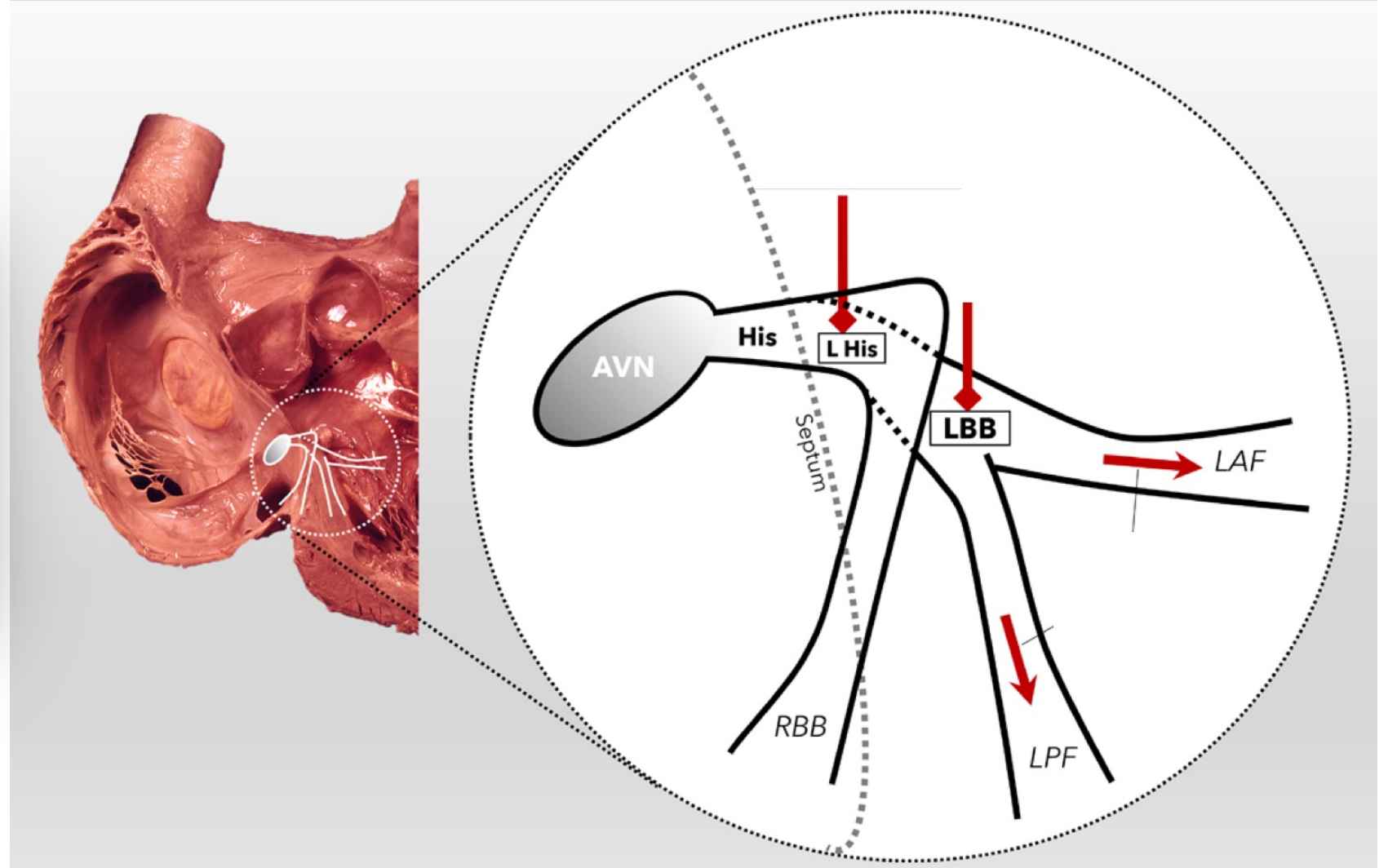
Kalumet

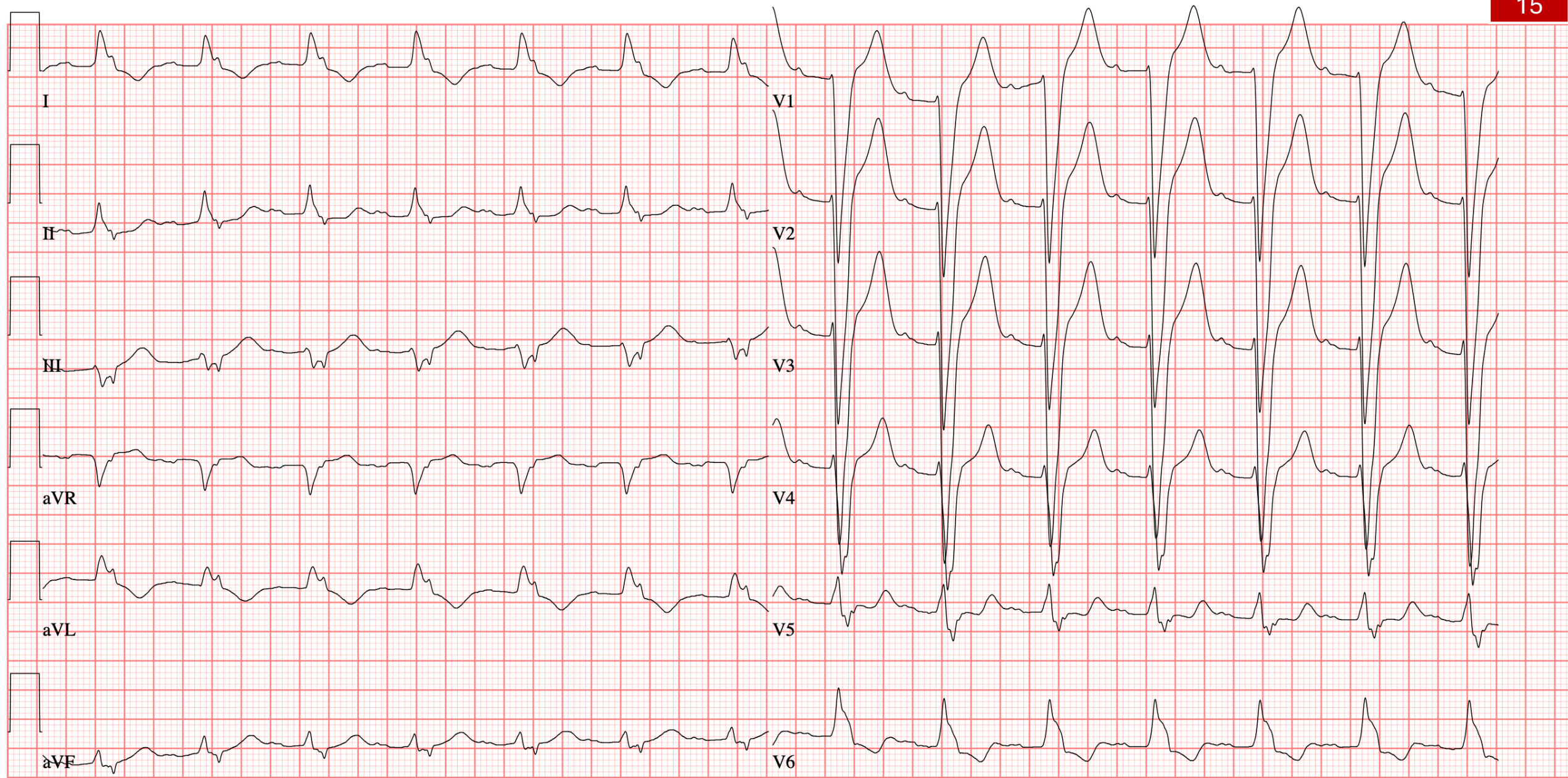
ANATOMIE & PHYSIOLOGIE DU CŒUR • TISSU NODAL

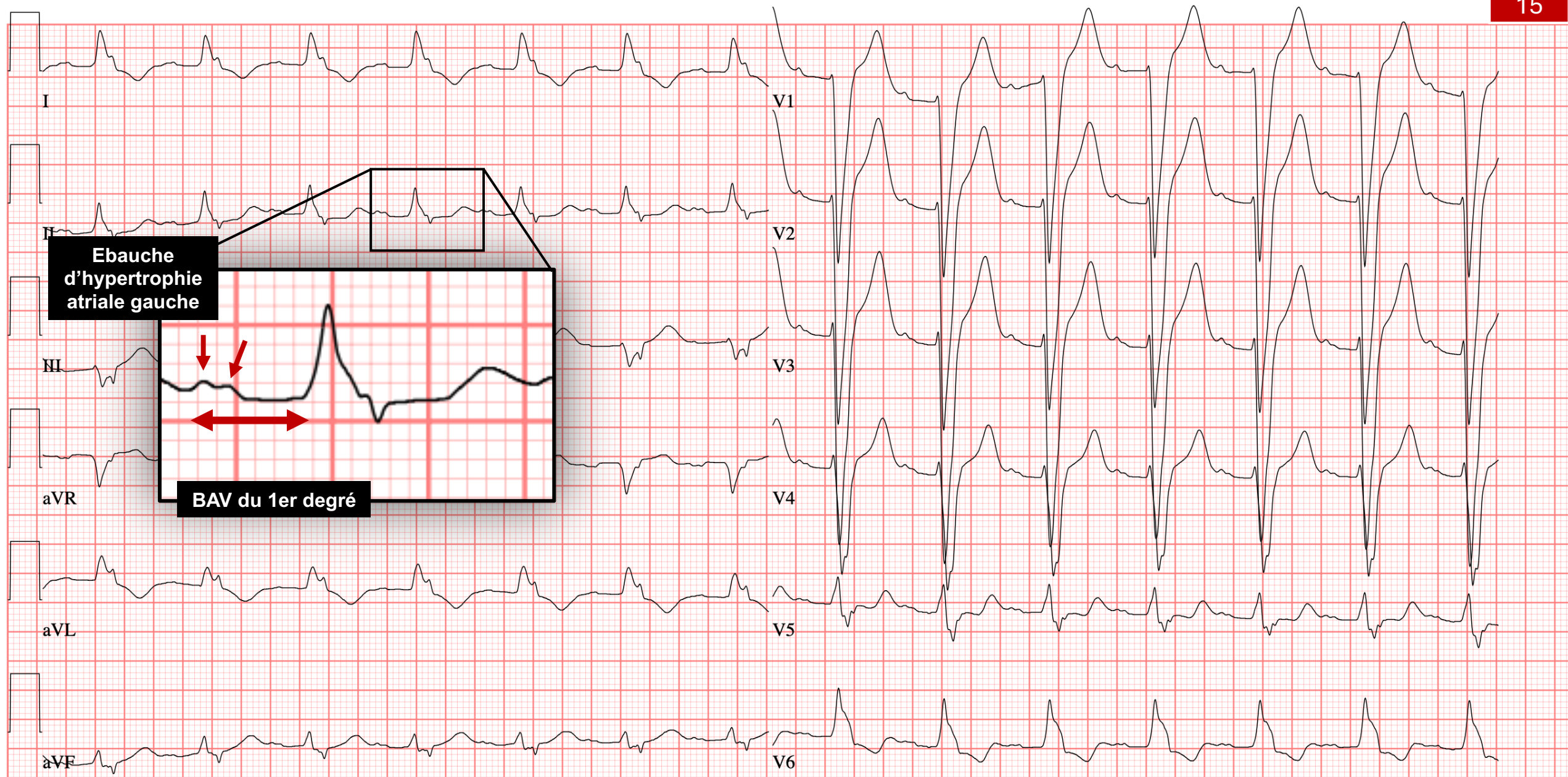


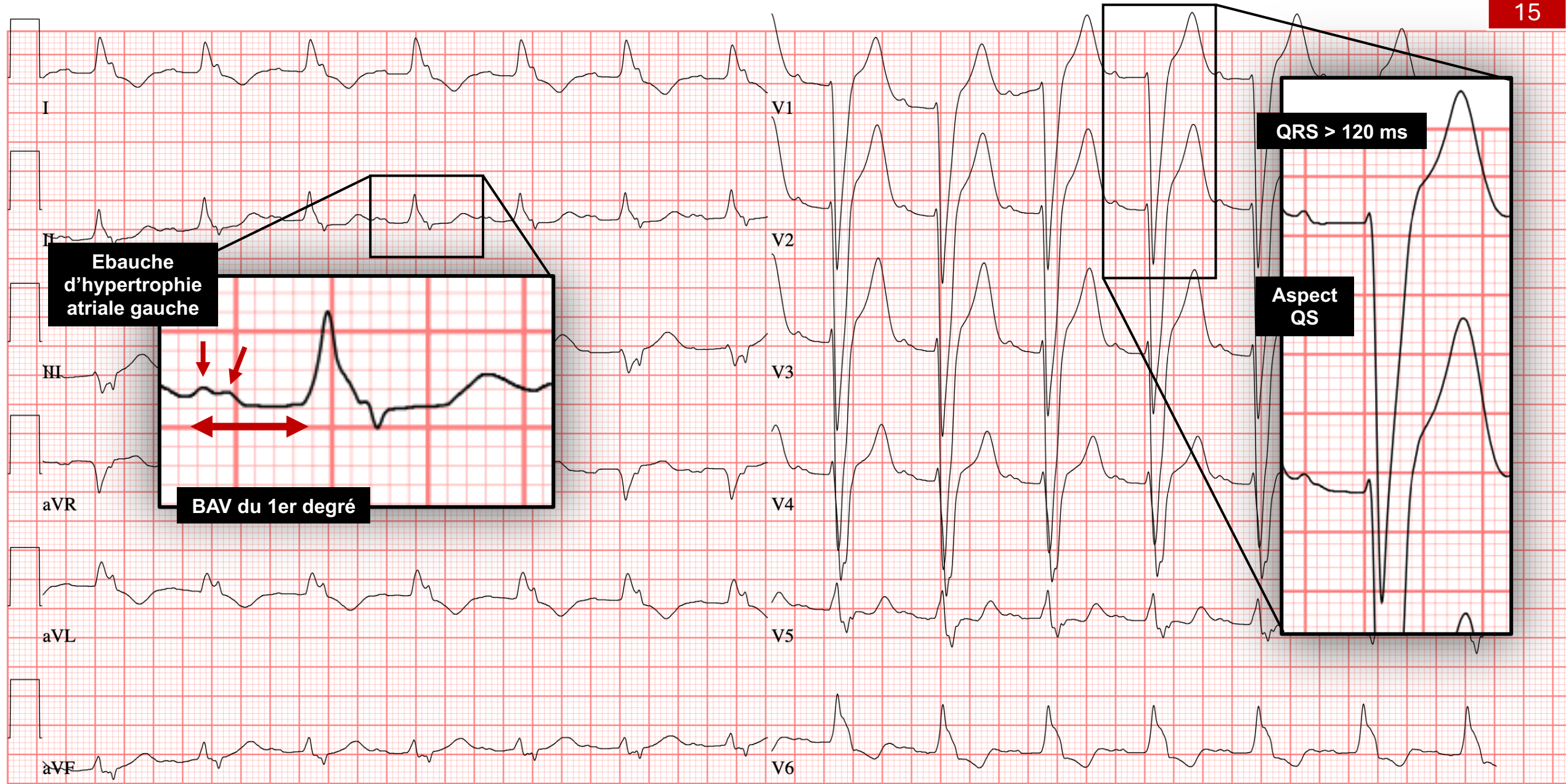
Guyton and Hall textbook of medical physiology. 11th ed. 2006. Saunders / Elsevier

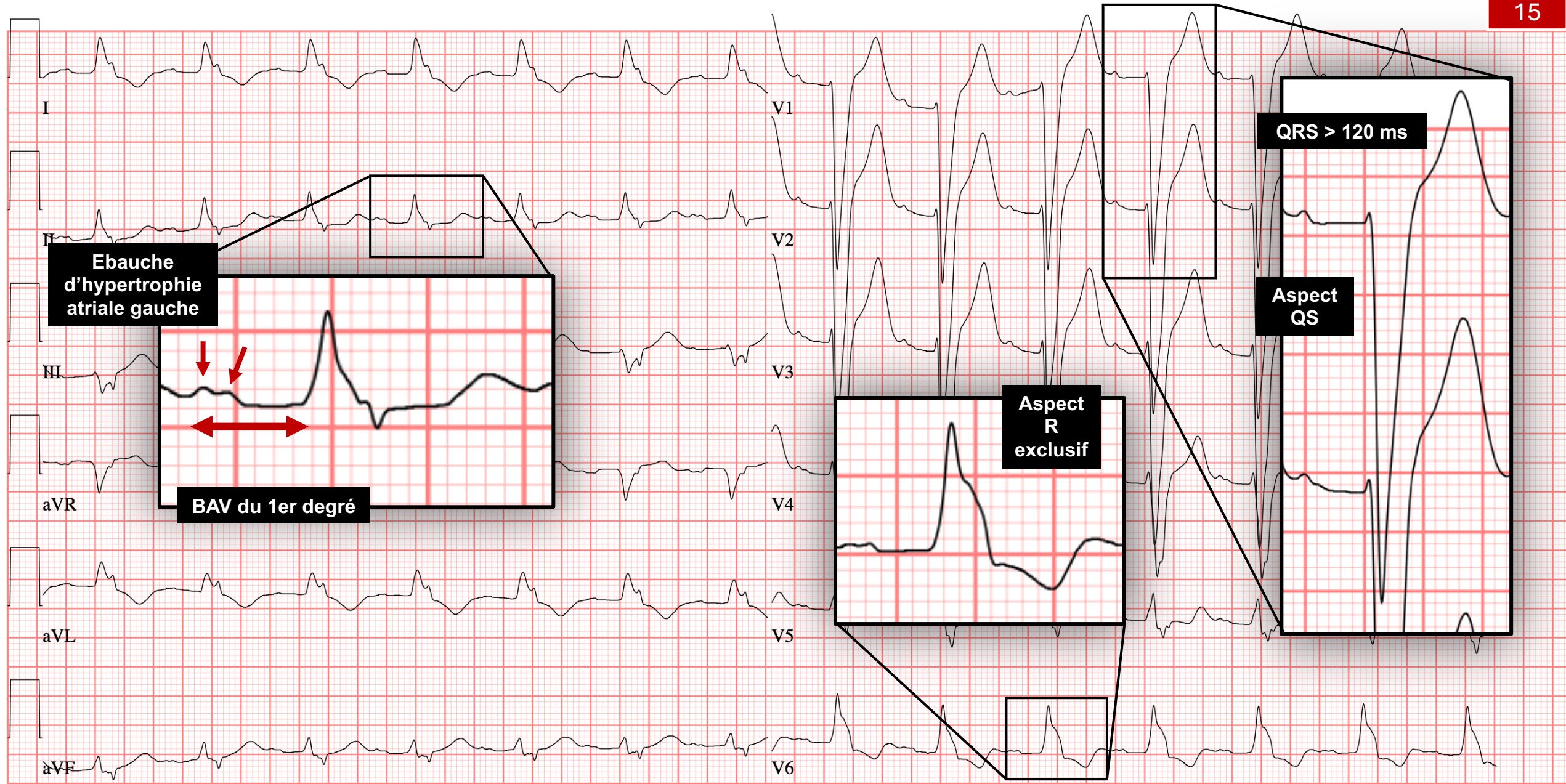
Troubles conductifs atrio- ventriculaires





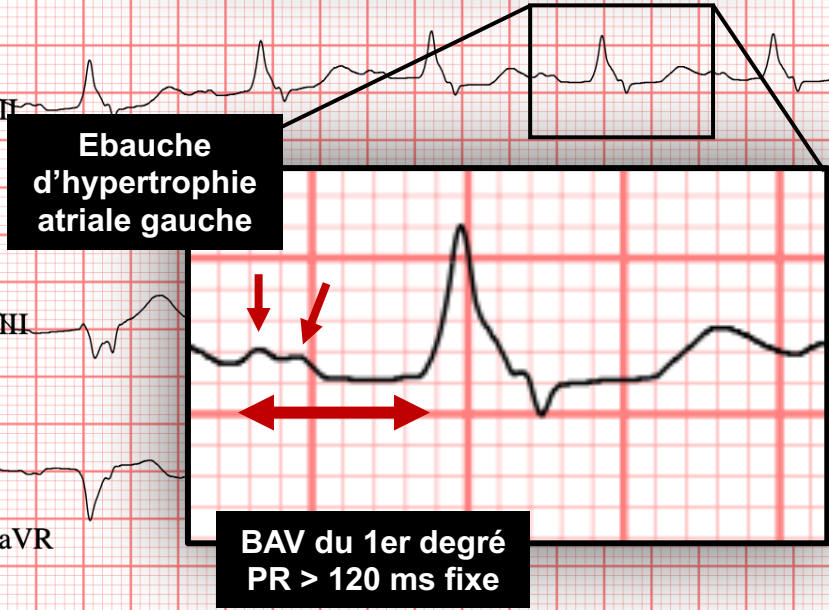






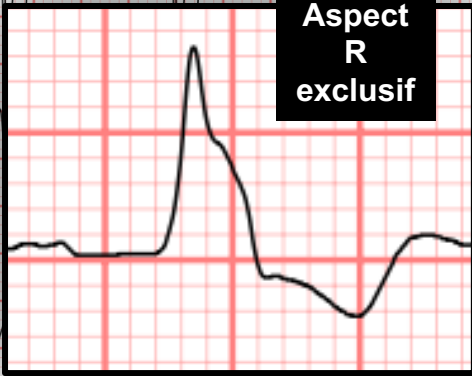
**Bloc de branche gauche
&
BAV du 1^{er} degré**

**Ebauche
d'hypertrophie
atriale gauche**



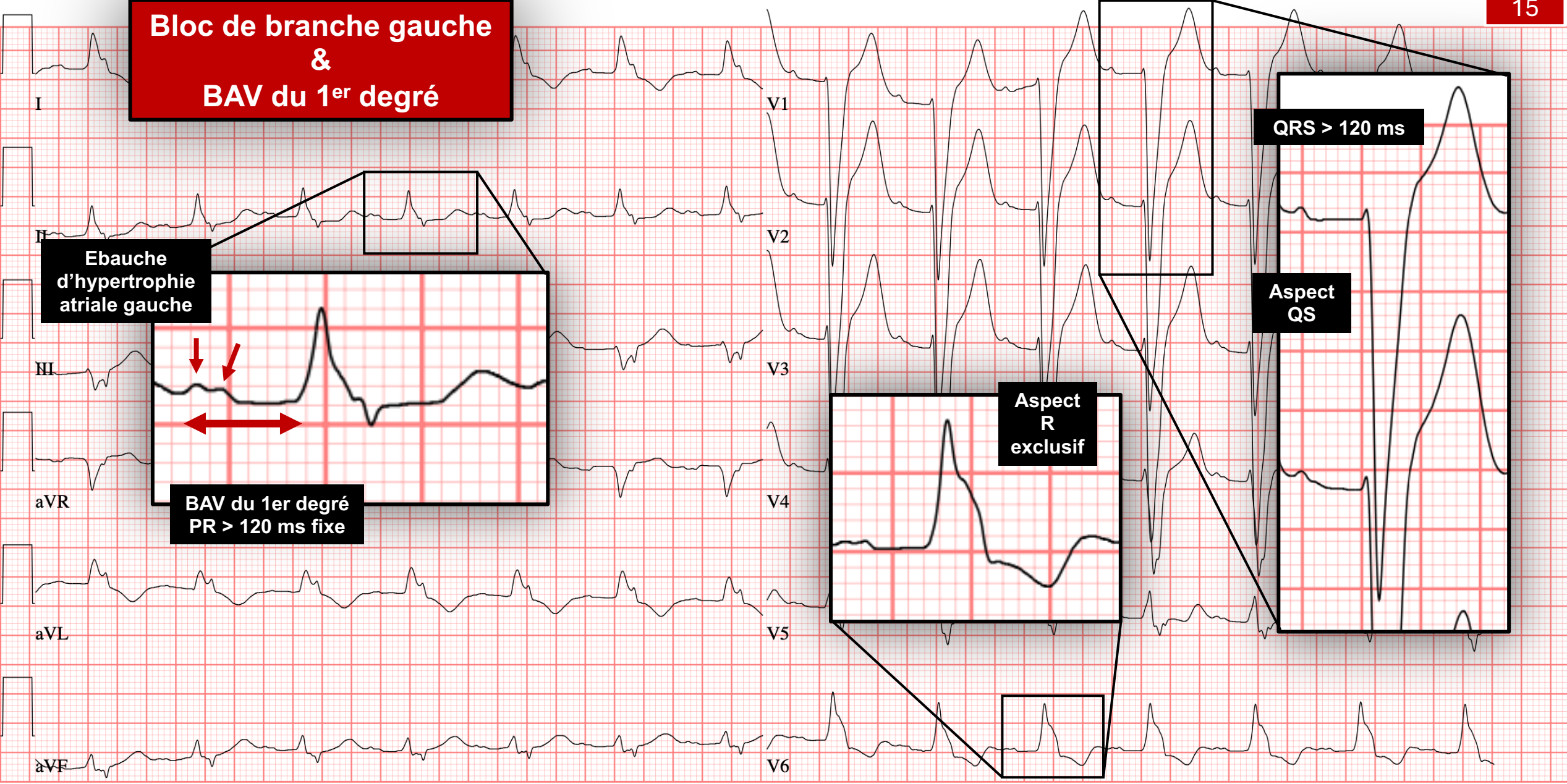
**BAV du 1^{er} degré
PR > 120 ms fixe**

**Aspect
R
exclusif**

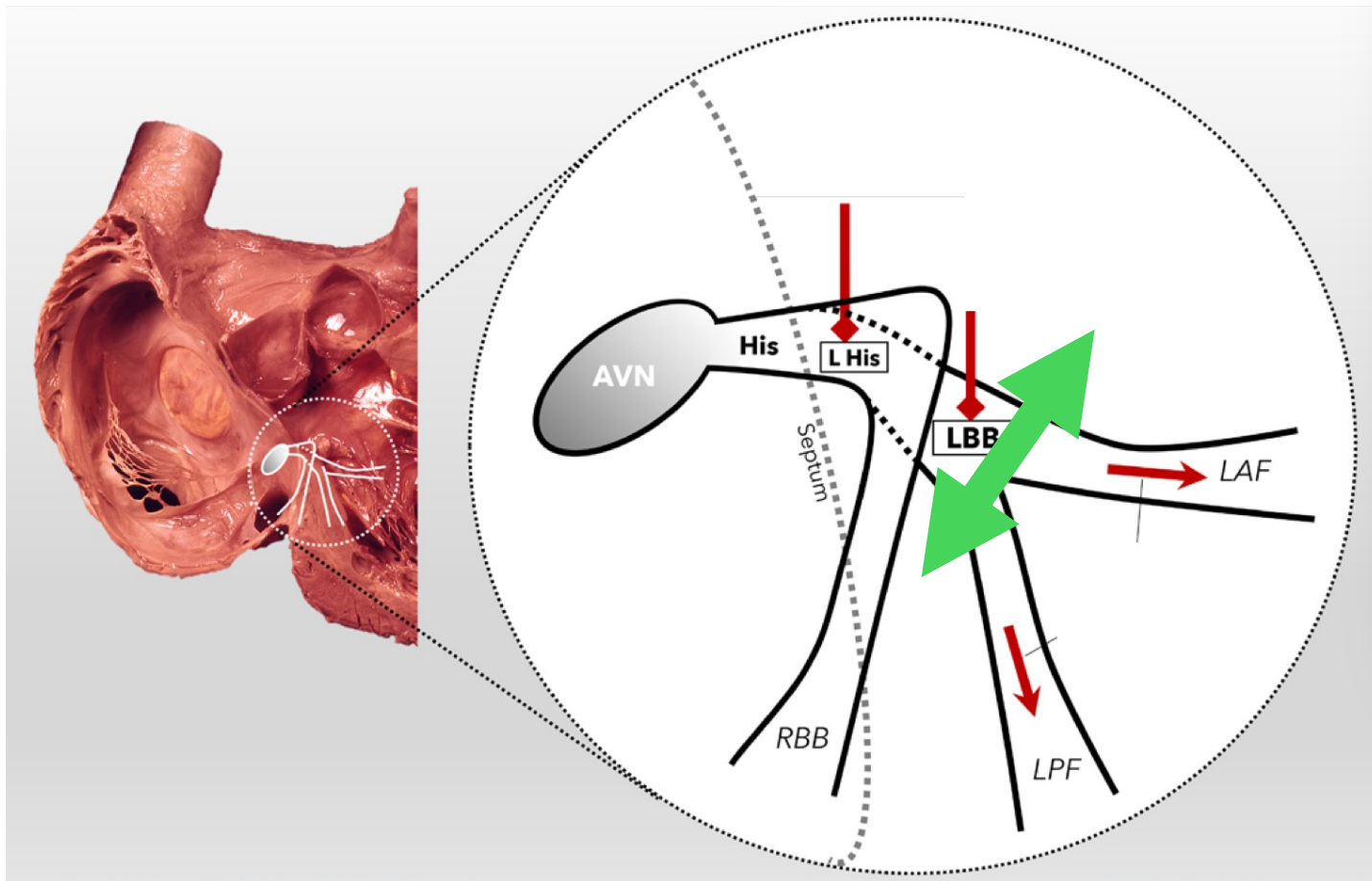


QRS > 120 ms

**Aspect
QS**



BLOC DE BRANCHE GAUCHE



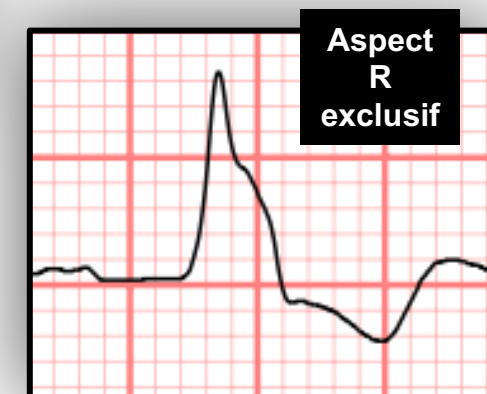
Upadhyay GA et al. Circulation 2019

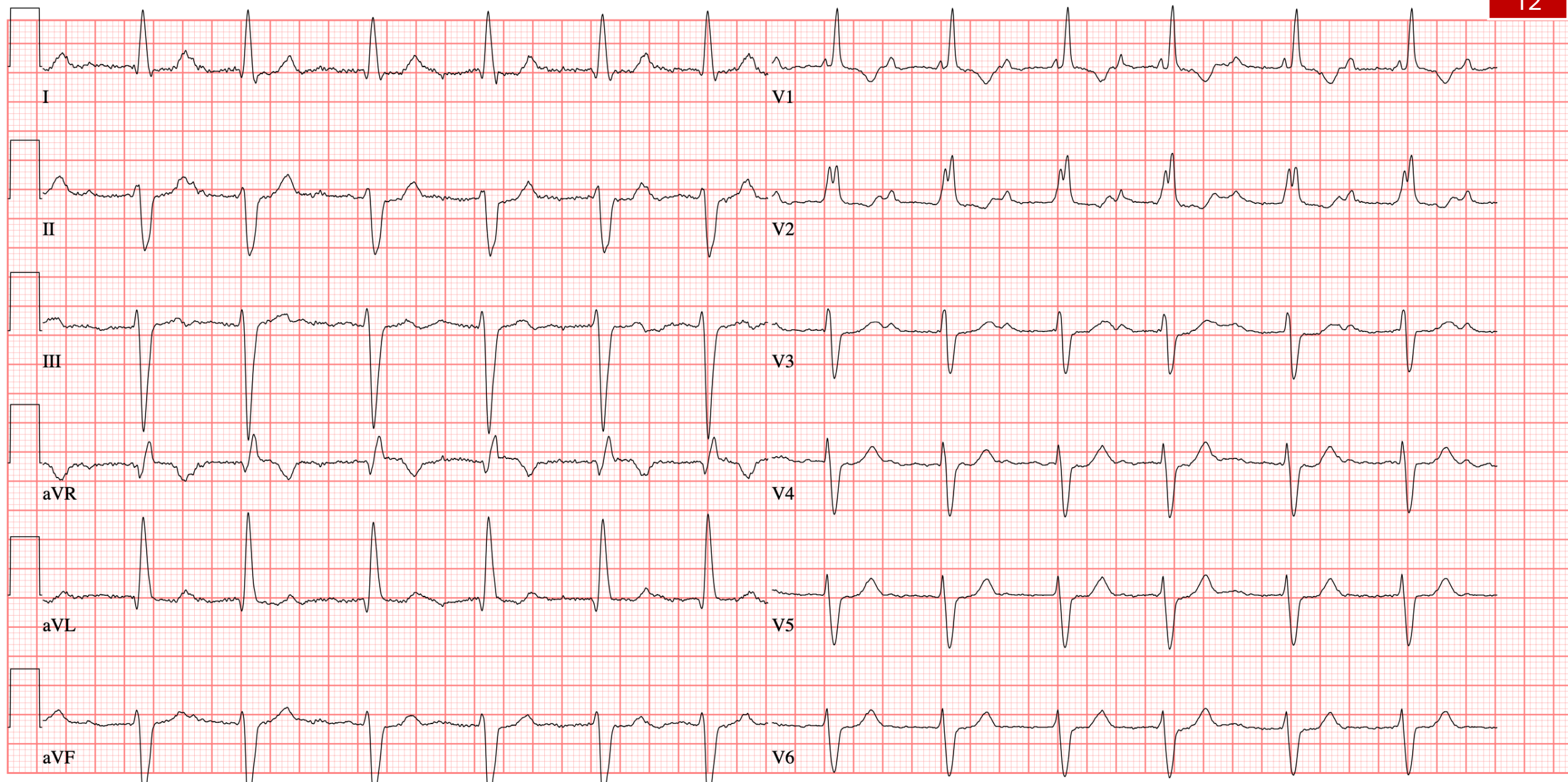


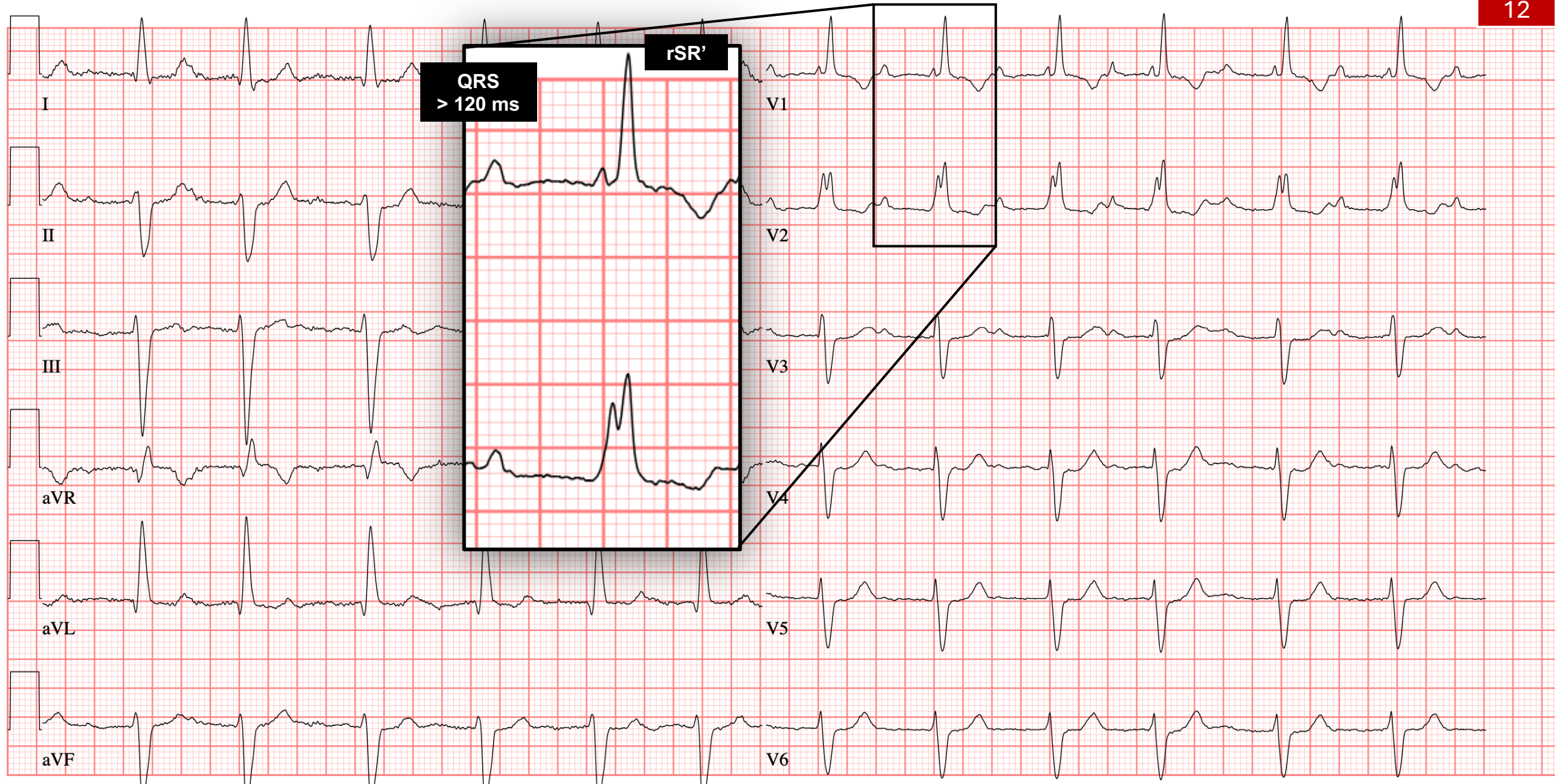
V1

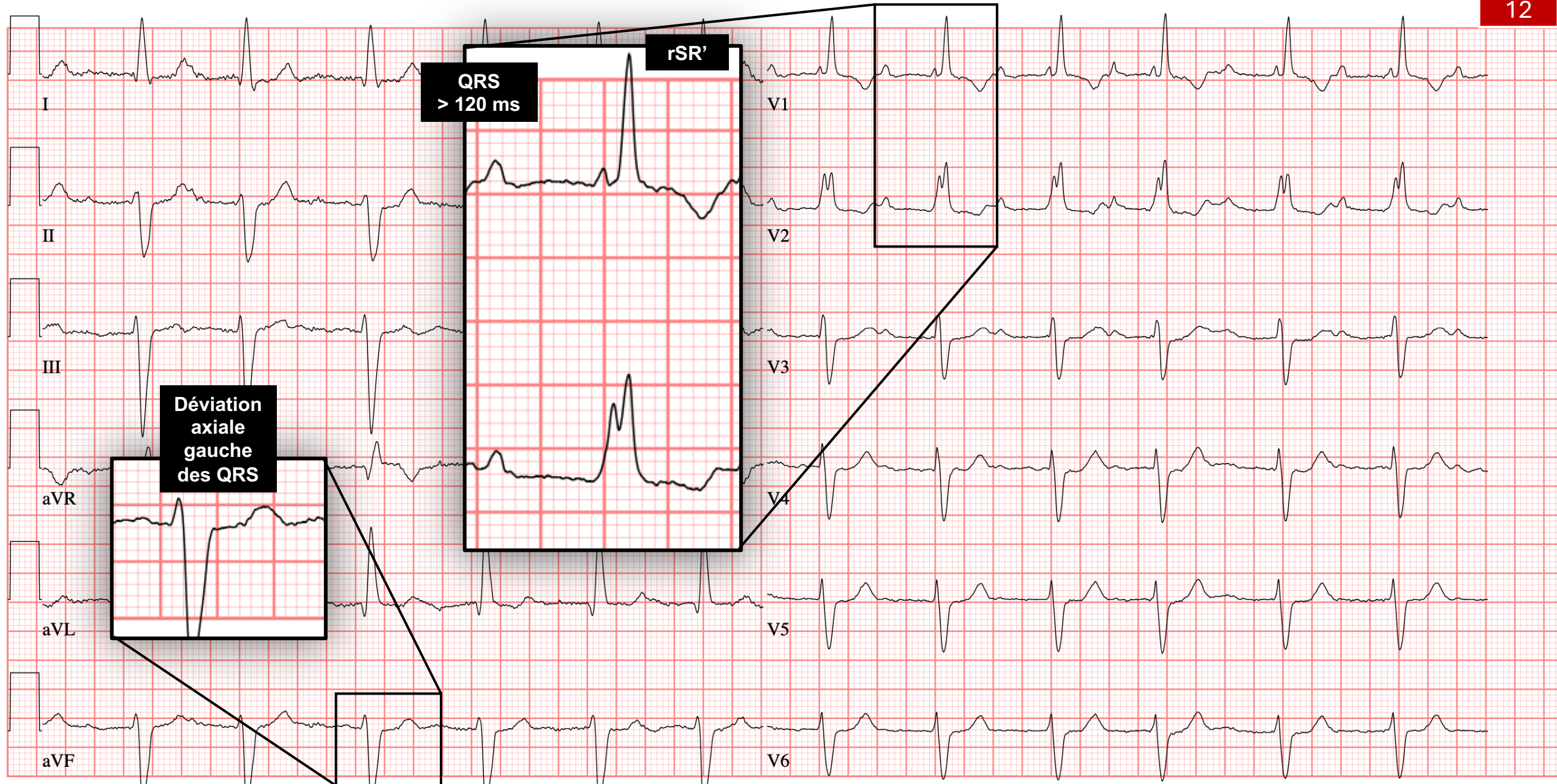
V2

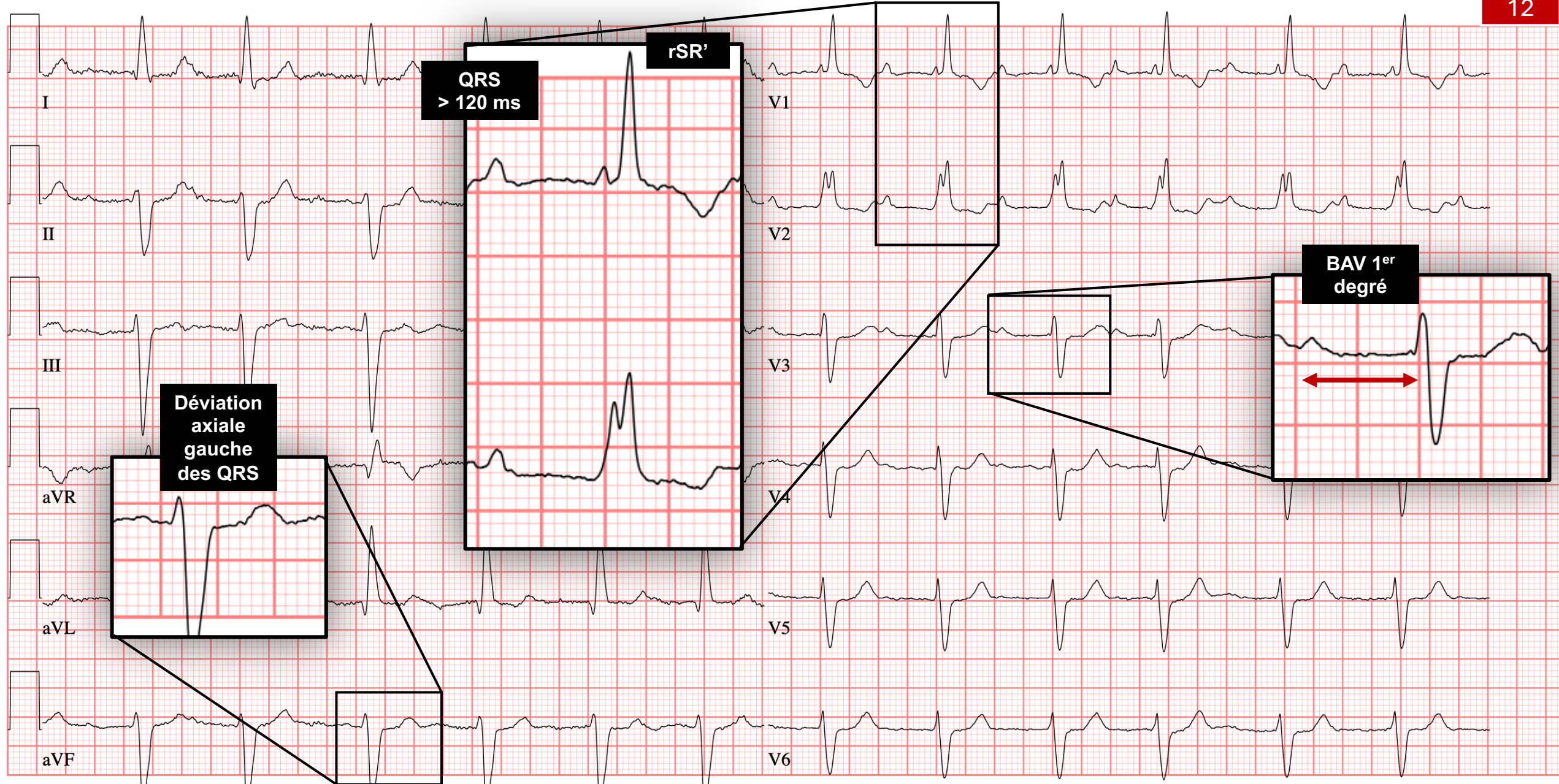
V6 & D1

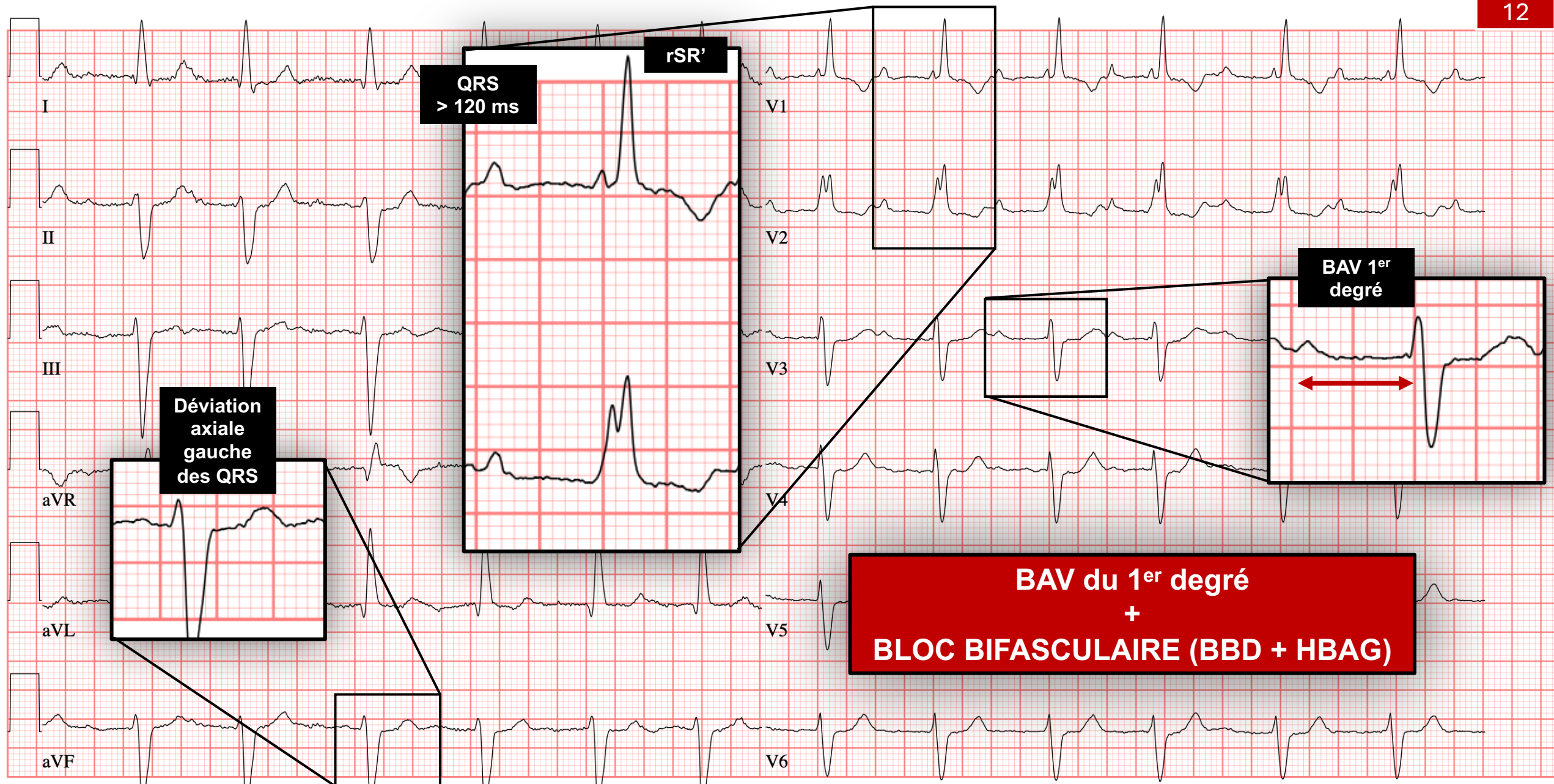




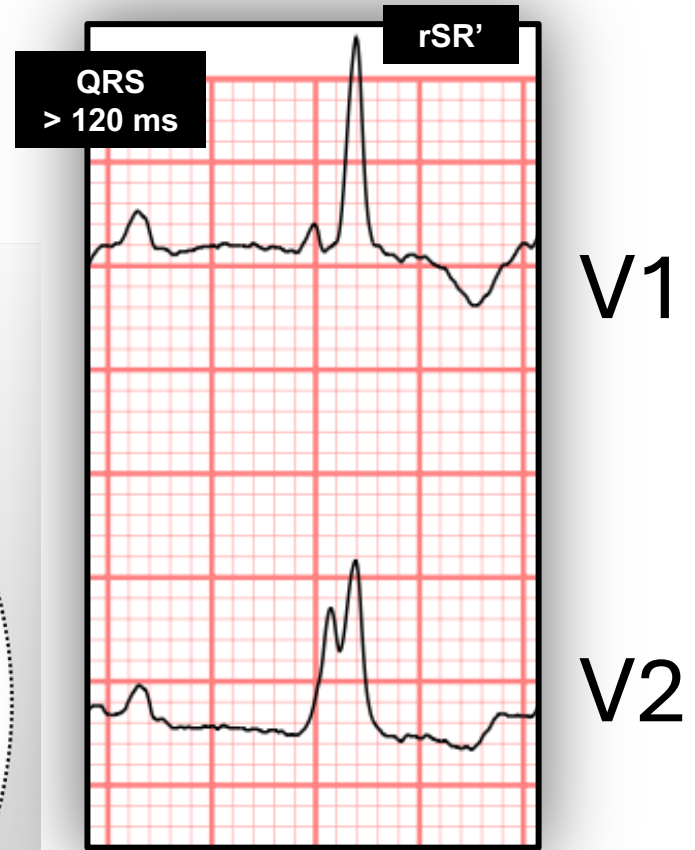
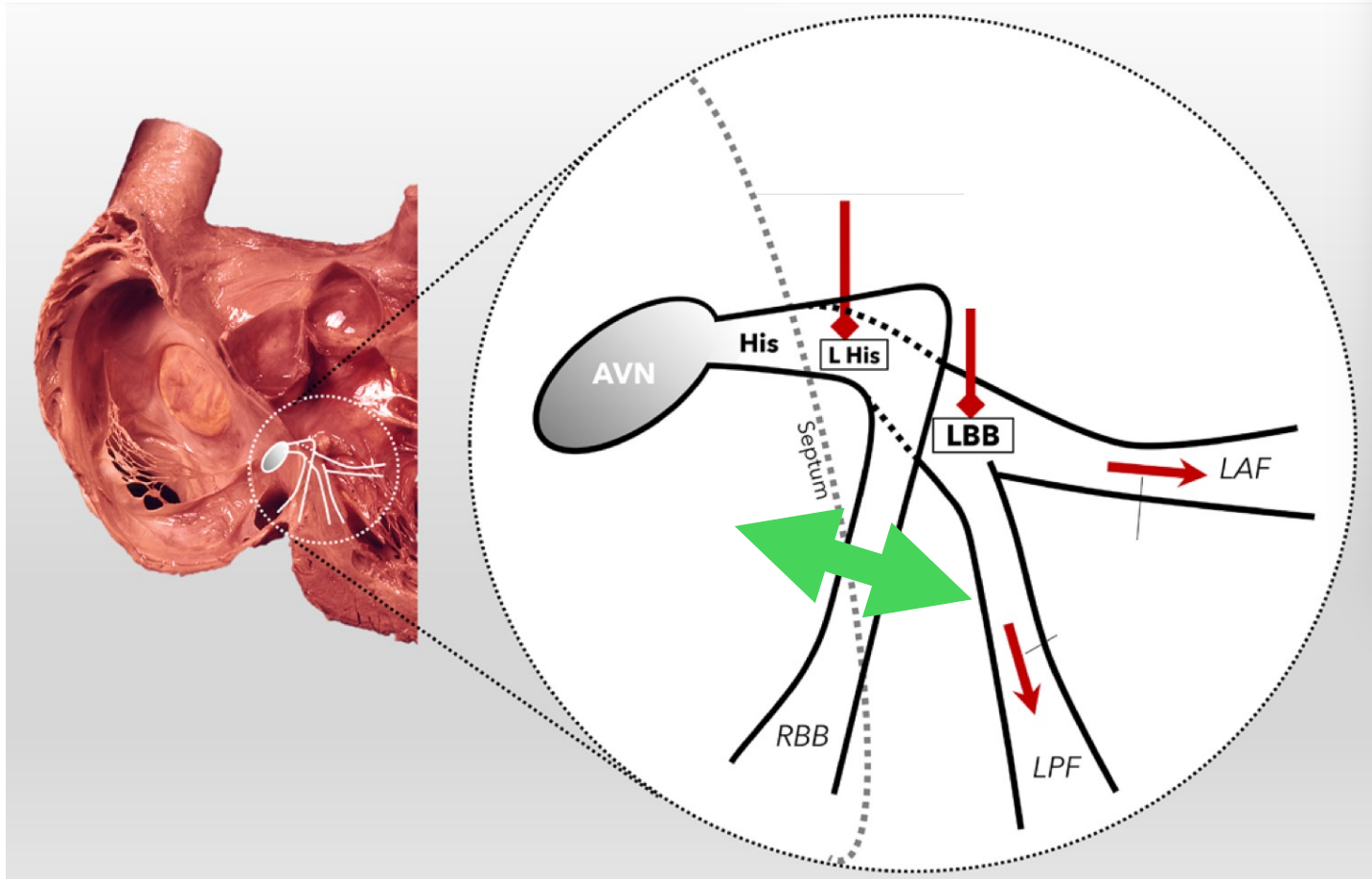






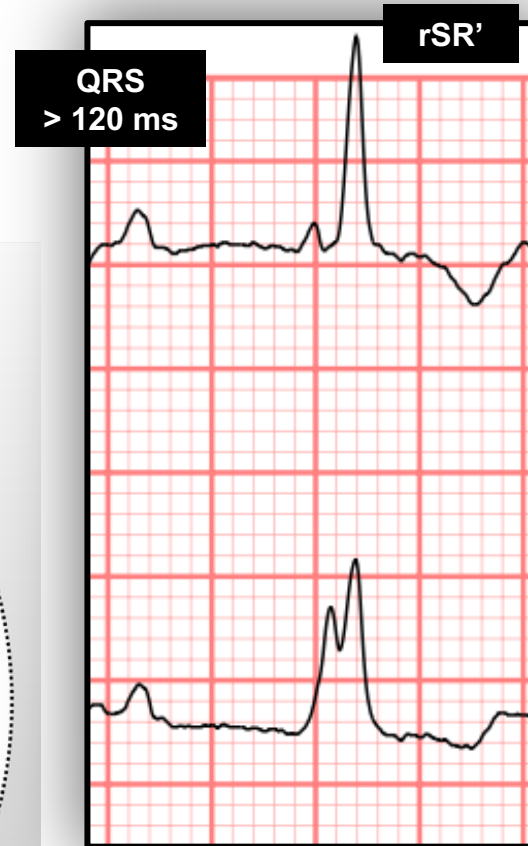
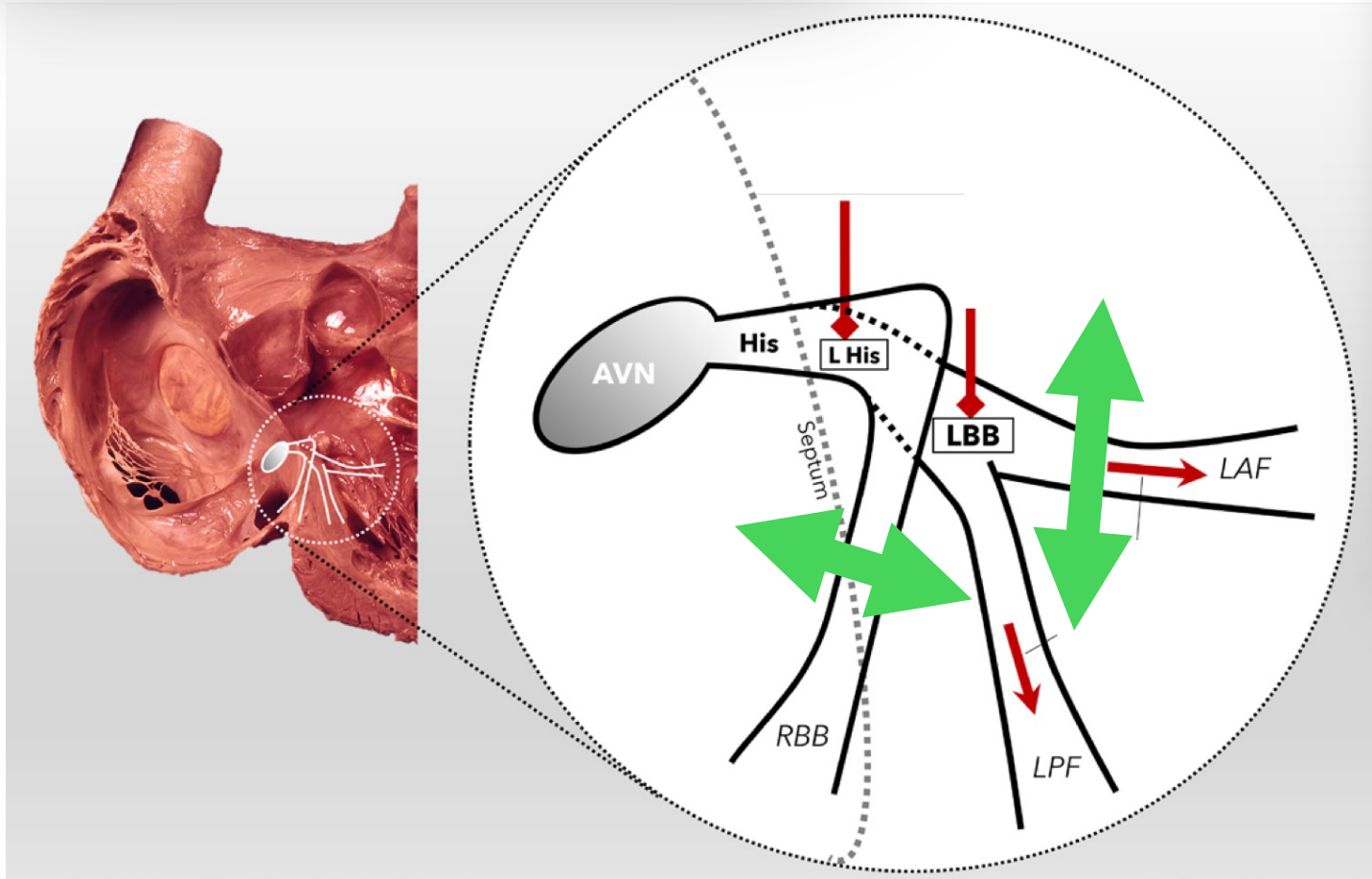


BLOC DE BRANCHE DROITE



BLOC DE BRANCHE DROITE

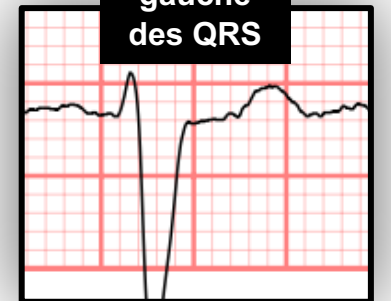
+ HEMIBLOC ANTERIEUR GAUCHE

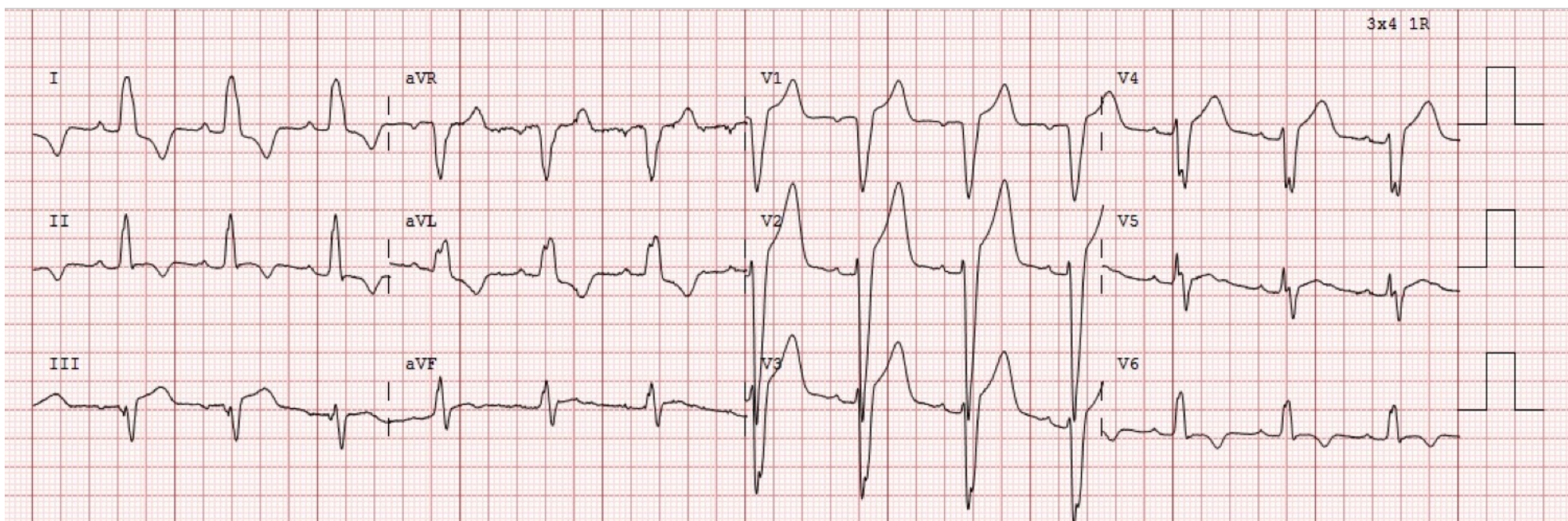
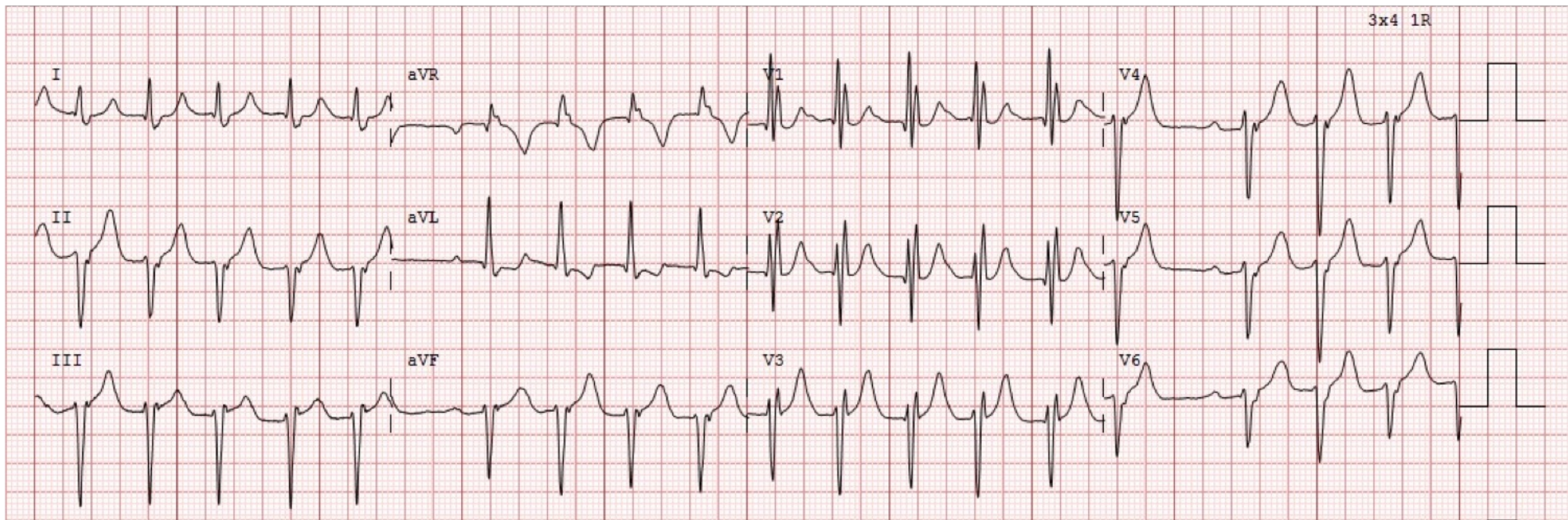


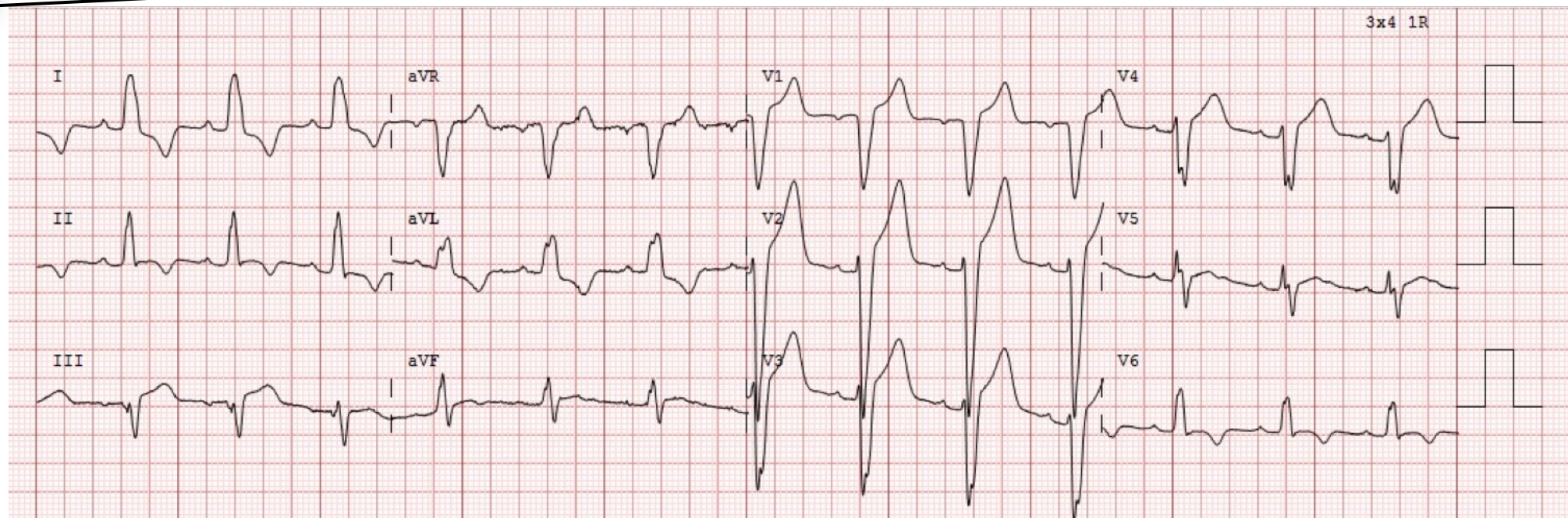
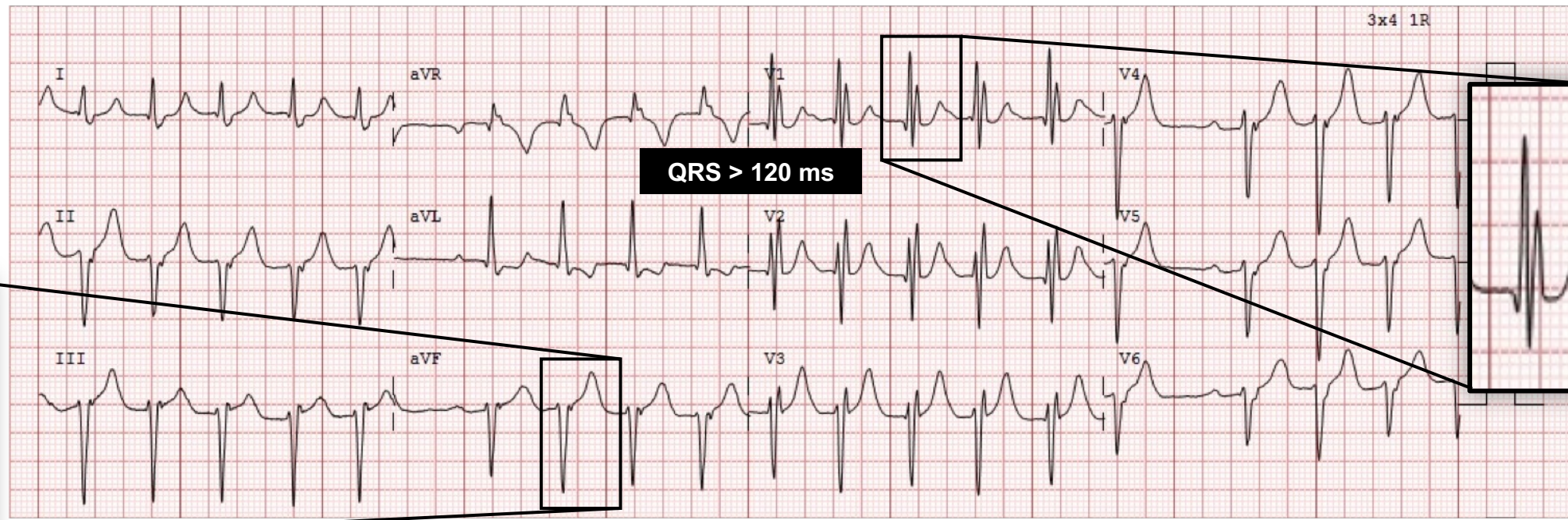
V1

V2

Dévi-
ation
axiale
gauche
des QRS

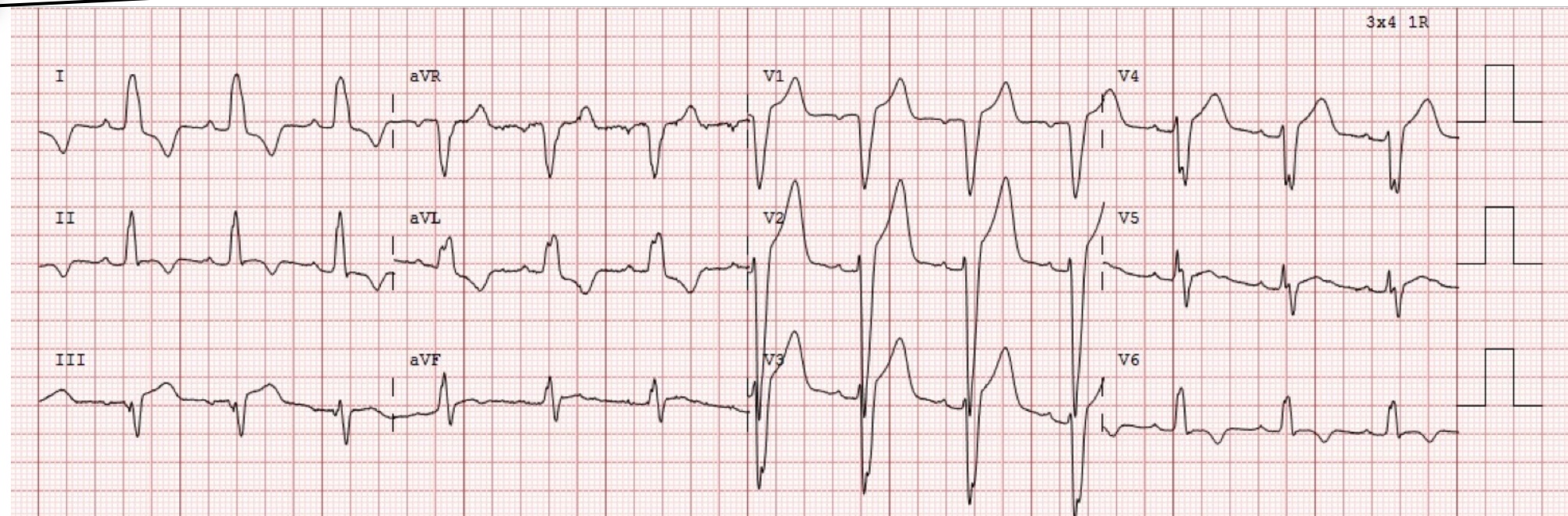
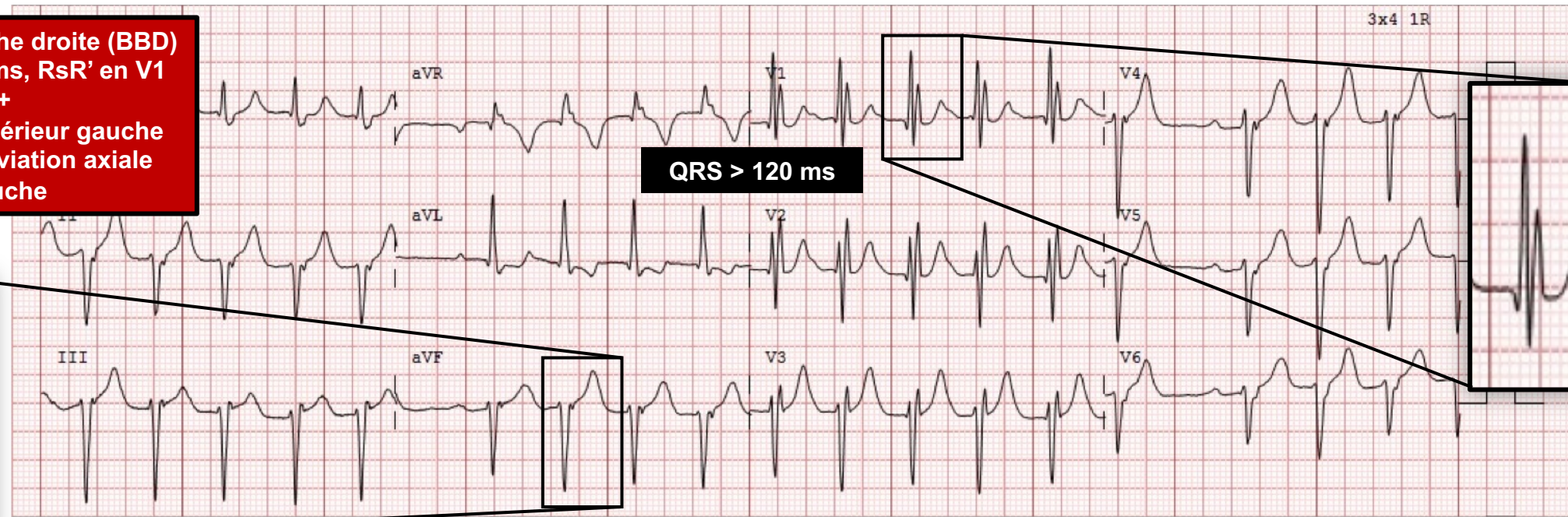




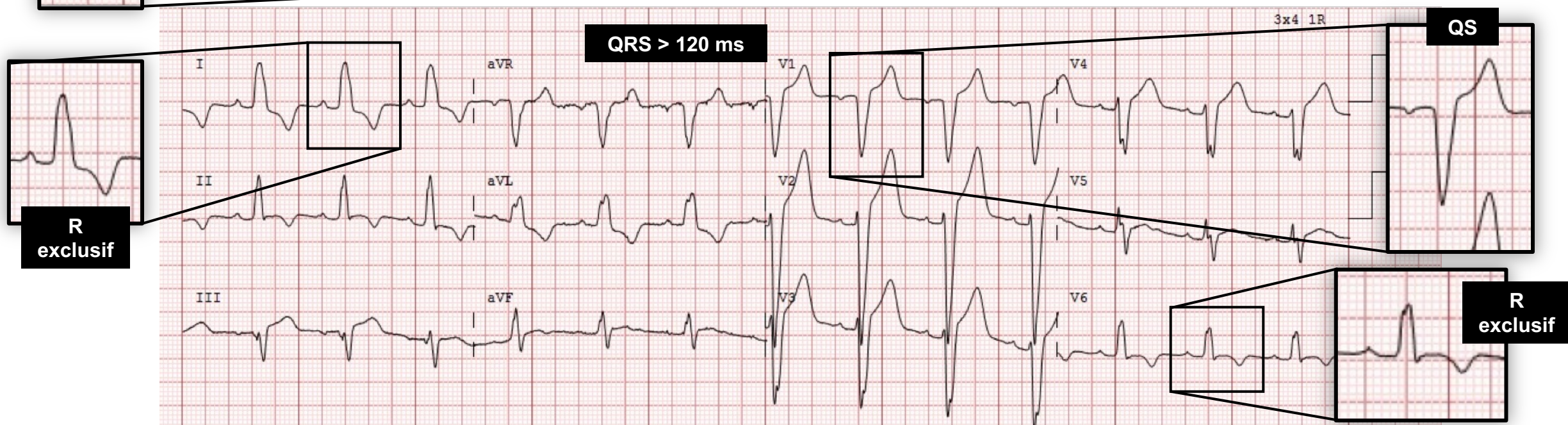
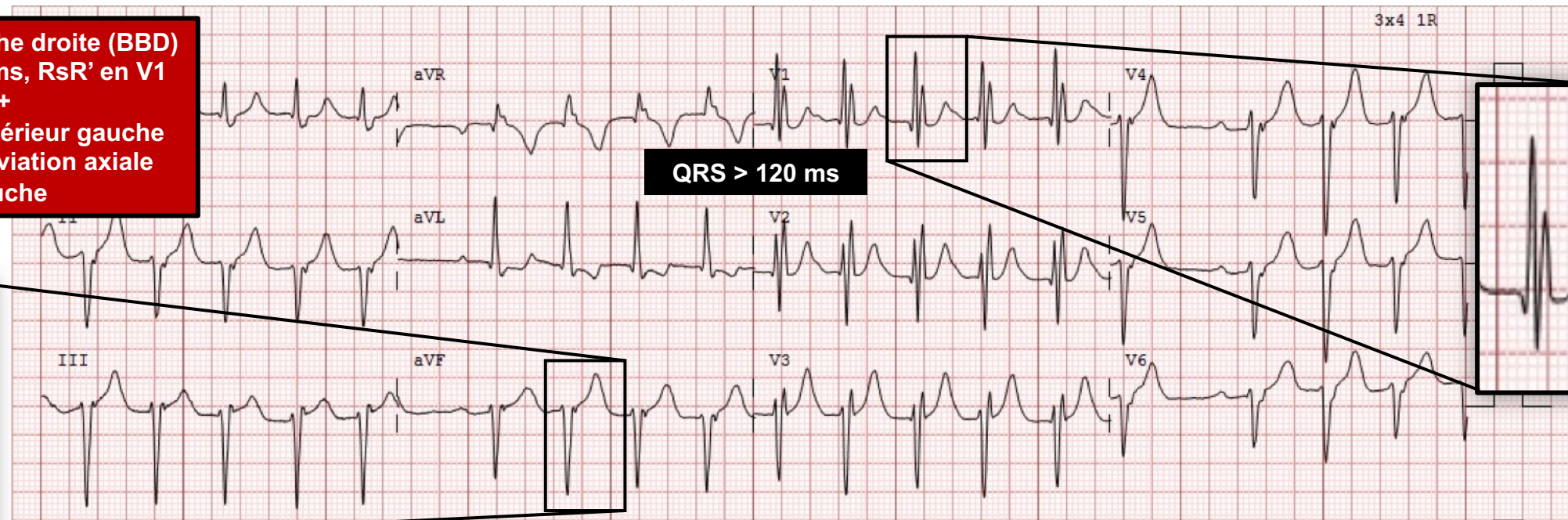


Bloc de branche droite (BBD)
: QRS > 120 ms
+
Hémibloc antérieur gauche (HBAG)
: déviation axiale gauche

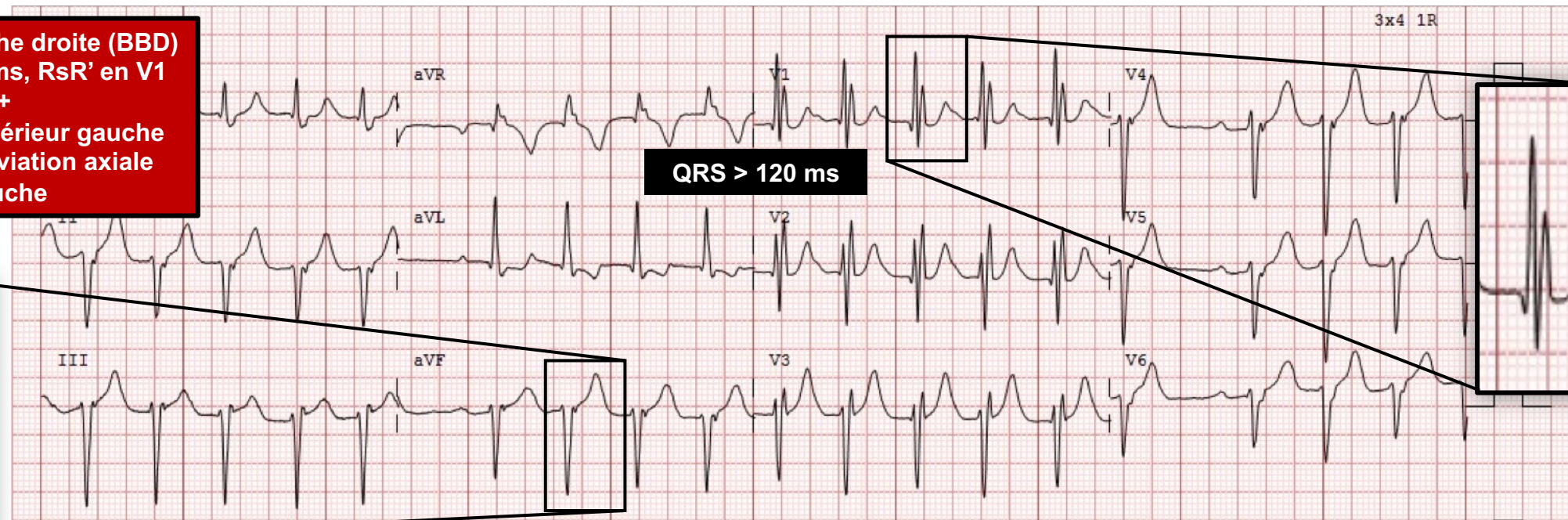
Axe G



Bloc de branche droite (BBD)
: QRS > 120 ms, RsR' en V1
+
Hémibloc antérieur gauche (HBAG)
(HBAG) : déviation axiale
gauche



Bloc de branche droite (BBD)
: QRS > 120 ms, RsR' en V1
+
Hémibloc antérieur gauche (HBAG)
(HBAG) : déviation axiale gauche



Axe G

QRS > 120 ms

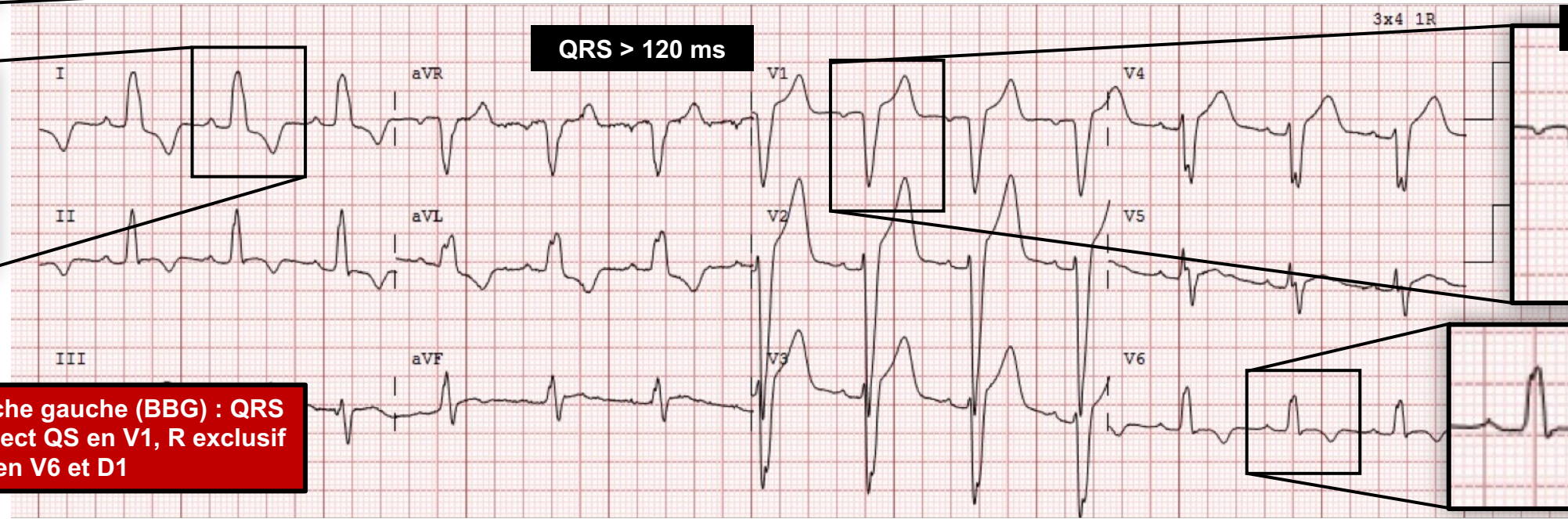
RsR'

QRS > 120 ms

QS

R exclusif

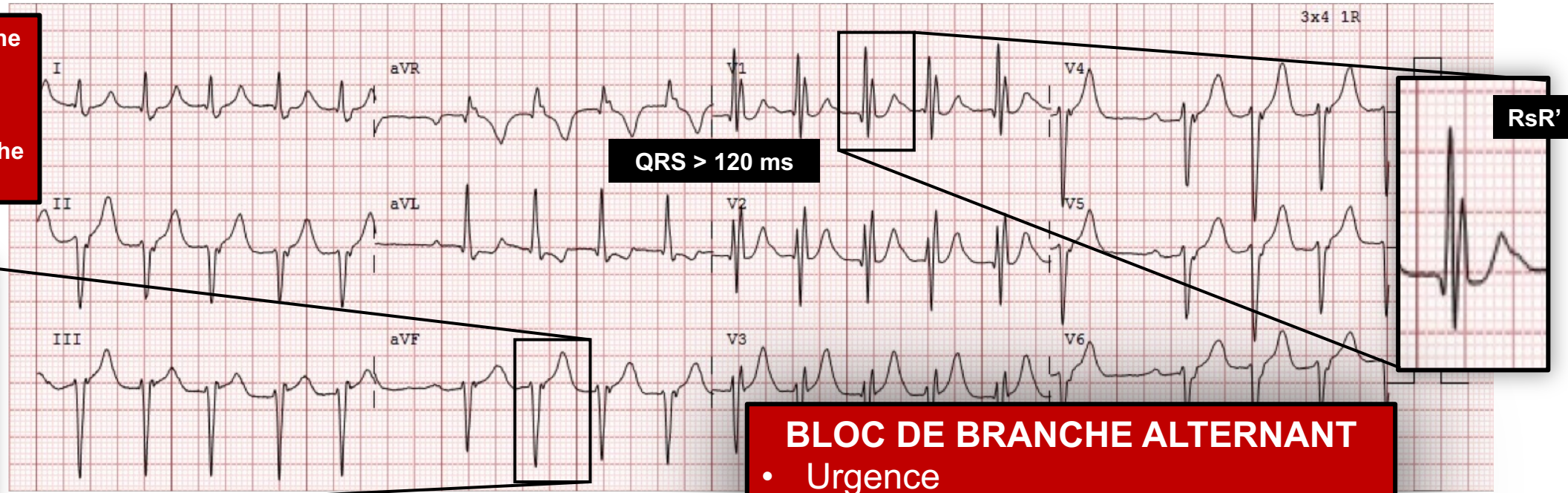
Bloc de branche gauche (BBG)
> 120 ms, aspect QS en V1, R exclusif en V6 et D1



R exclusif

**Bloc de branche droite (BBD)
+
Hémibloc
antérieur gauche
(HBAG)**

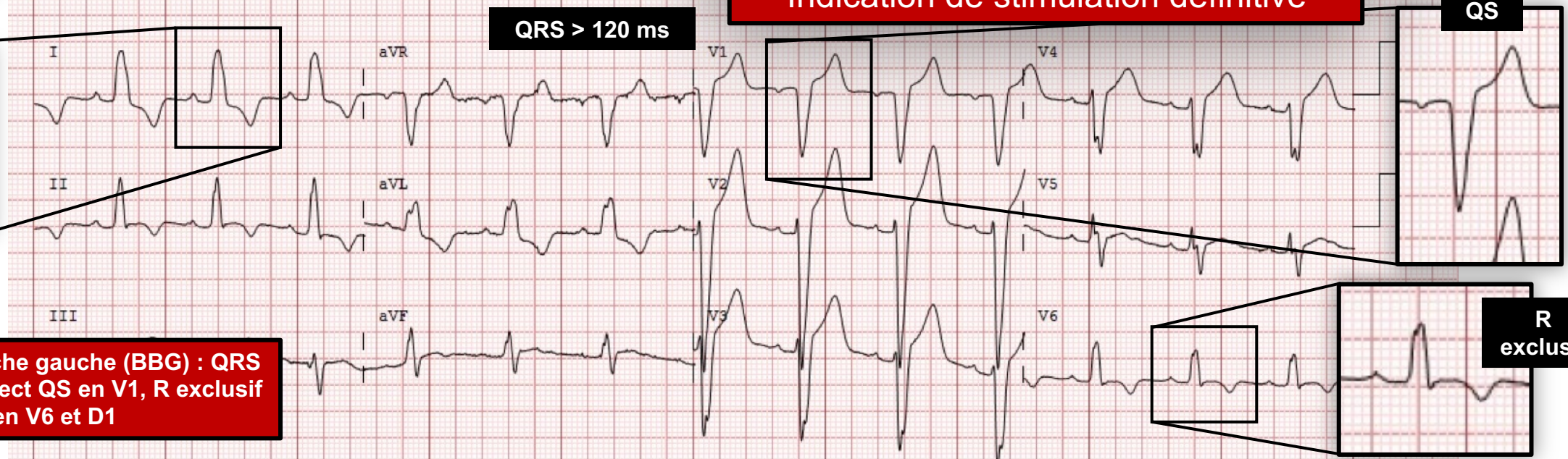
Axe G



BLOC DE BRANCHE ALTERNANT

- Urgence
- Indication de stimulation définitive

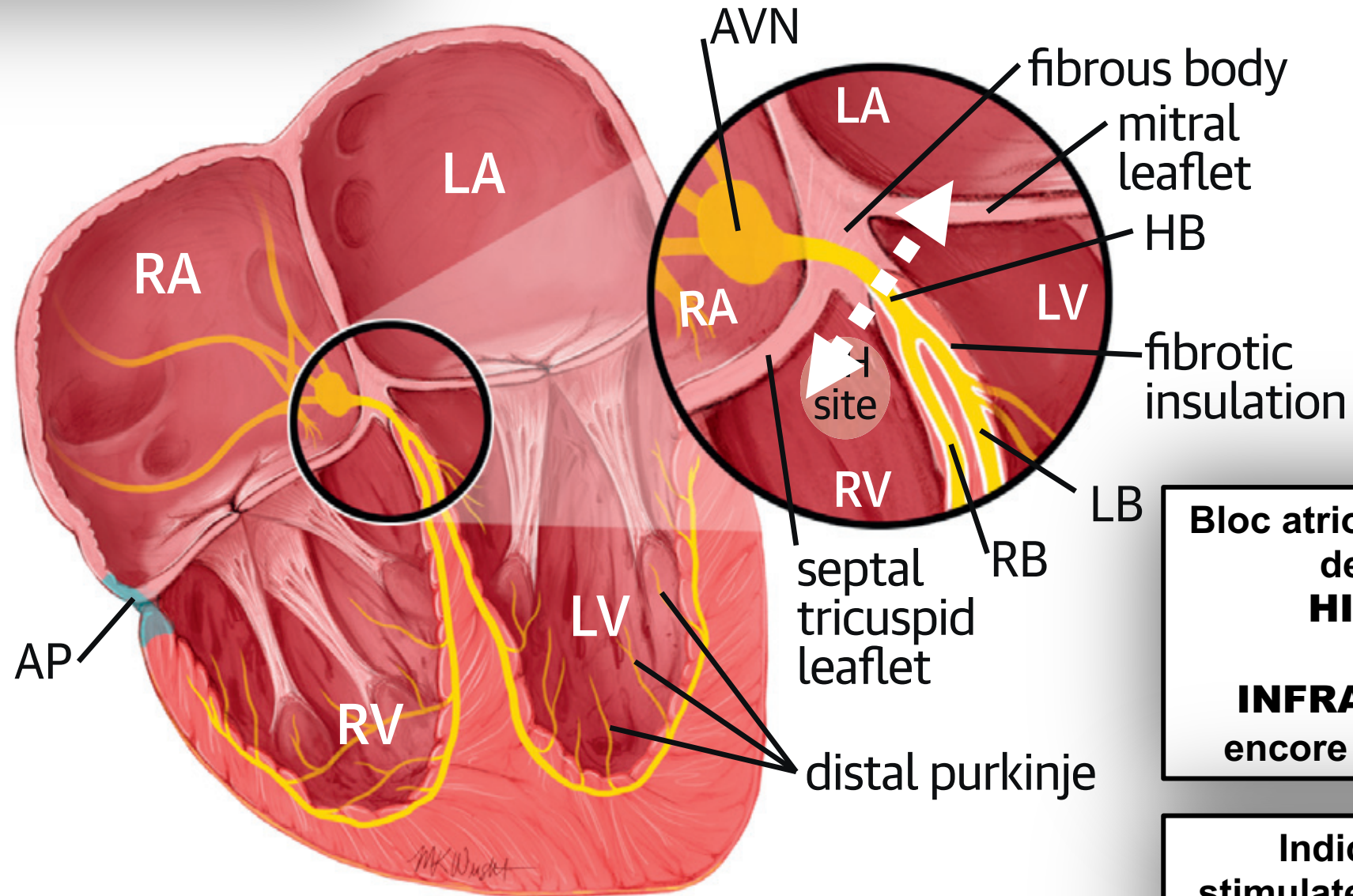
**R
exclusif**



**Bloc de branche gauche (BBG) : QRS
> 120 ms, aspect QS en V1, R exclusif
en V6 et D1**

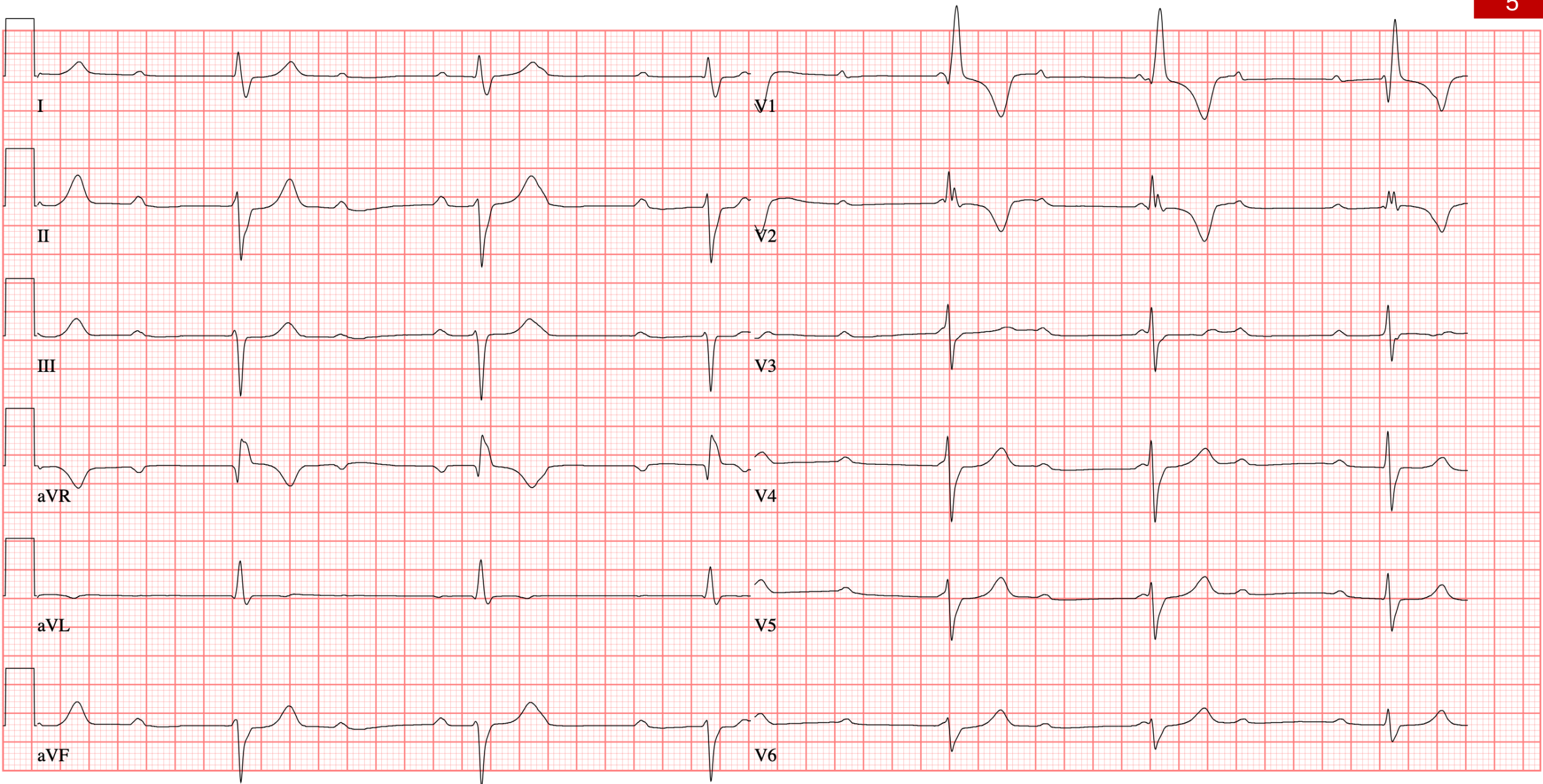
**R
exclusif**

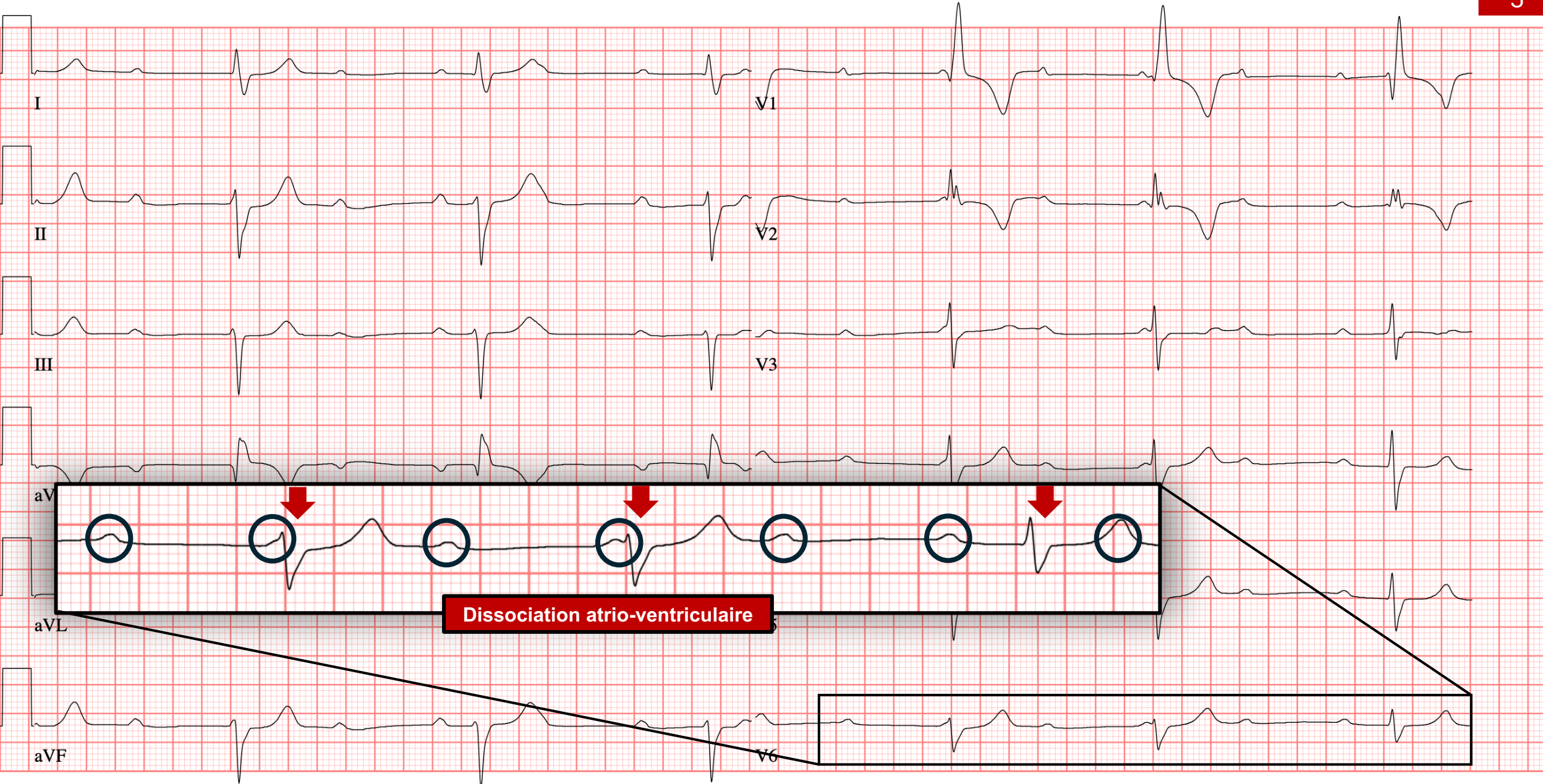
BLOC DE BRANCHE ALTERNANT



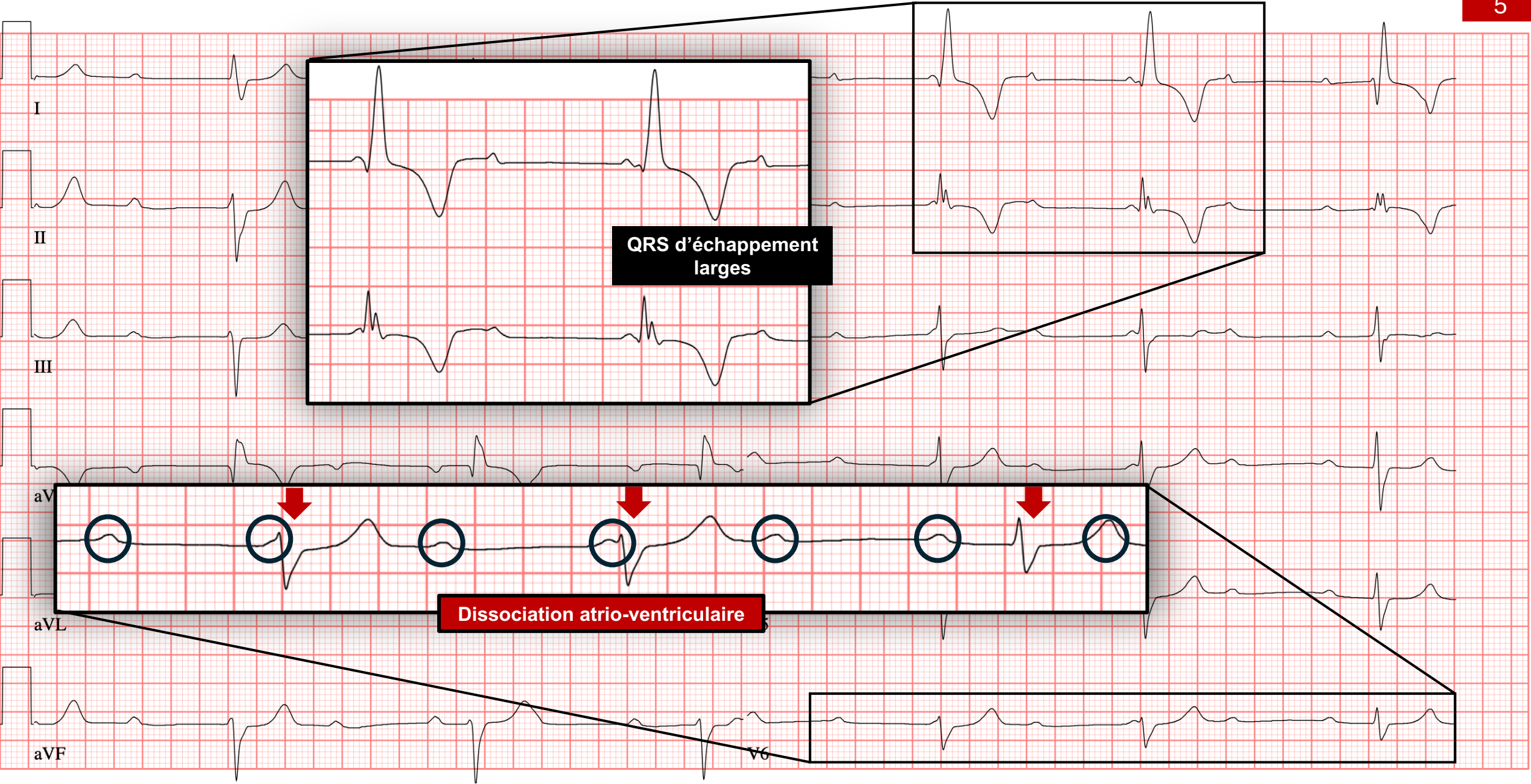
Bloc atrio-ventriculaire
de siège
HISSIEN
ou
INFRA-HISSIEN
encore intermittent

Indication de
stimulateur cardiaque
définitif



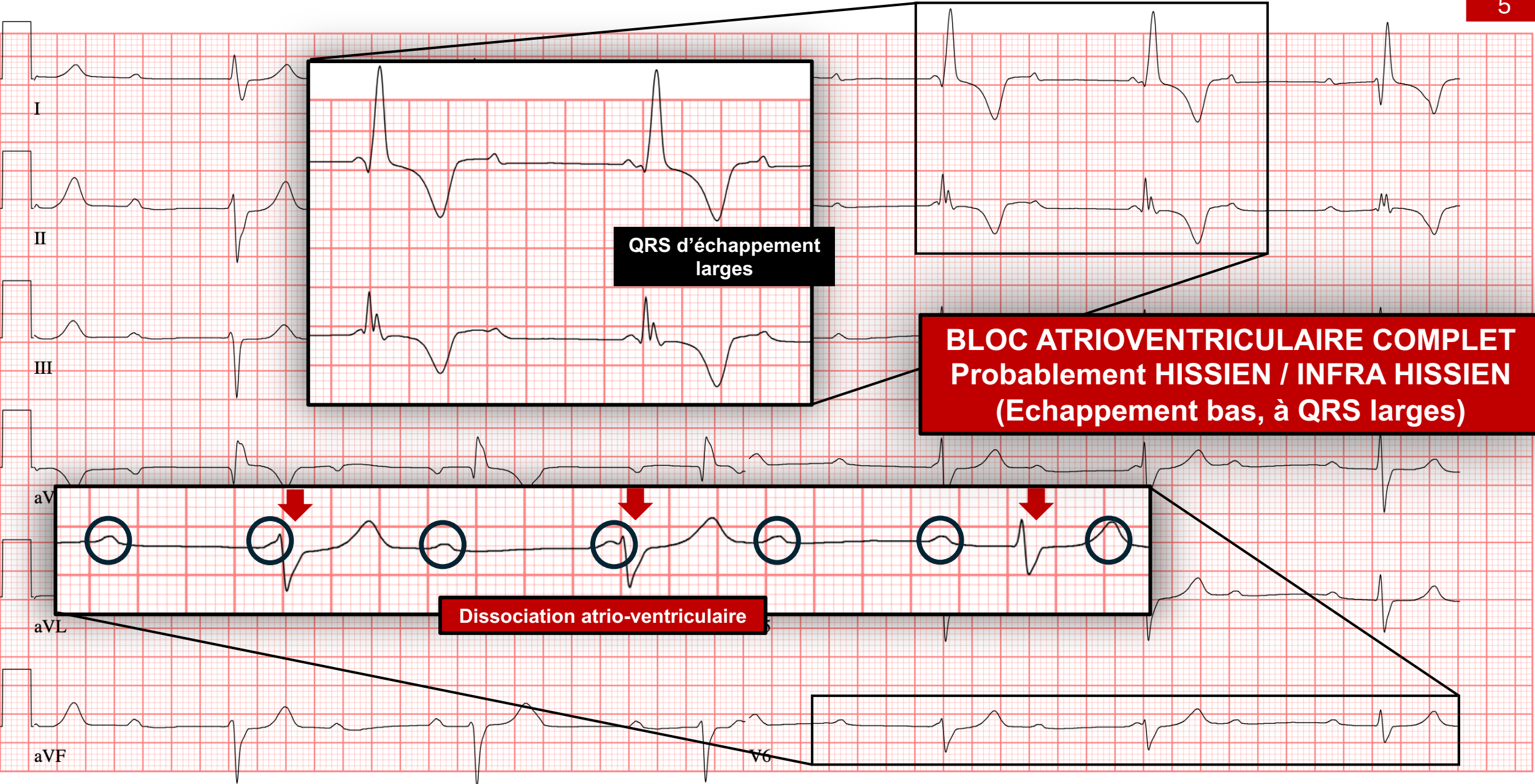


Dissociation atrio-ventriculaire



QRS d'échappement larges

Dissociation atrio-ventriculaire

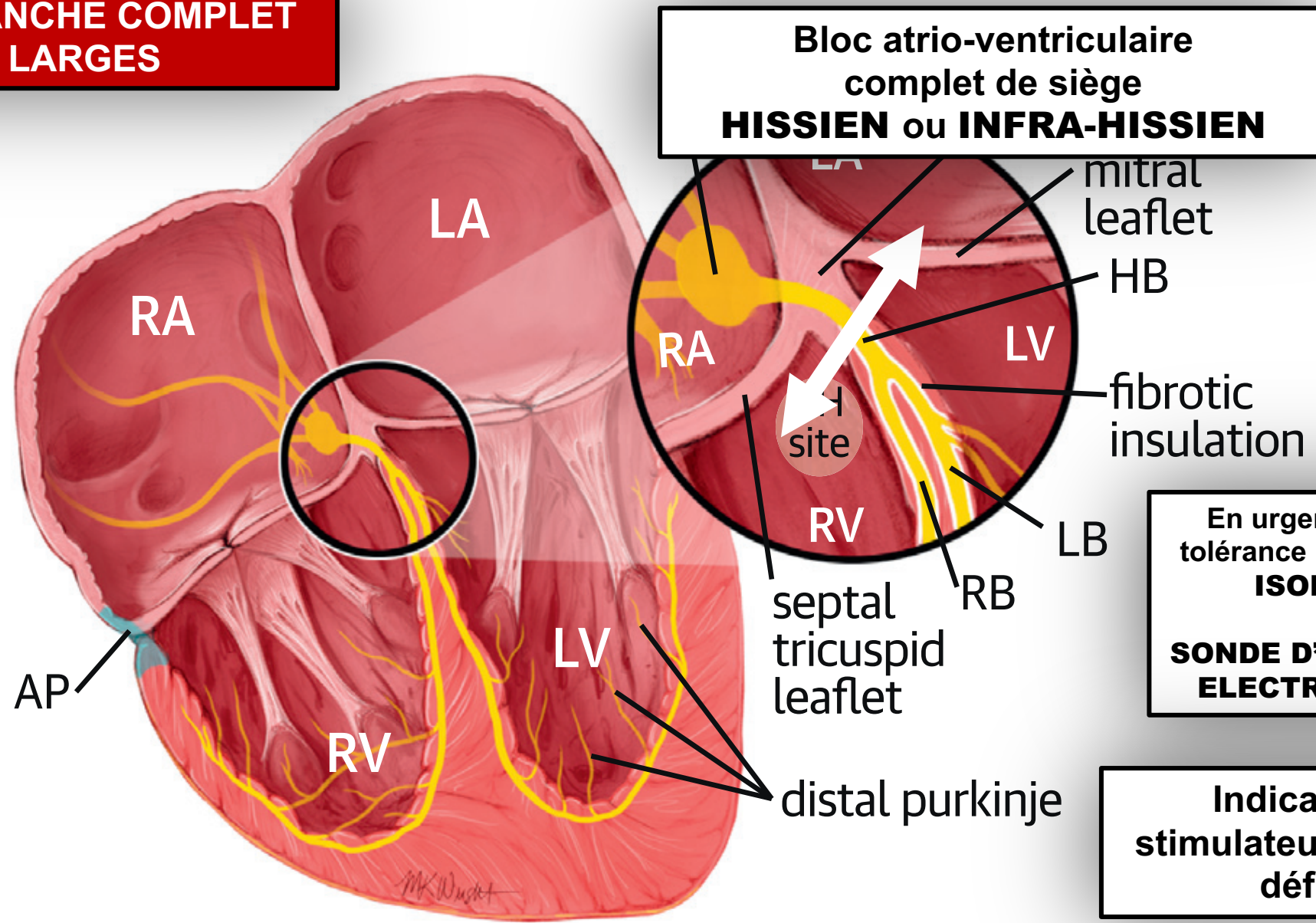


QRS d'échappement larges

BLOC ATRIOVENTRICULAIRE COMPLET
Probablement HISSIEN / INFRA HISSIEN
(Echappement bas, à QRS larges)

Dissociation atrio-ventriculaire

**BLOC DE BRANCHE COMPLET
A QRS LARGES**

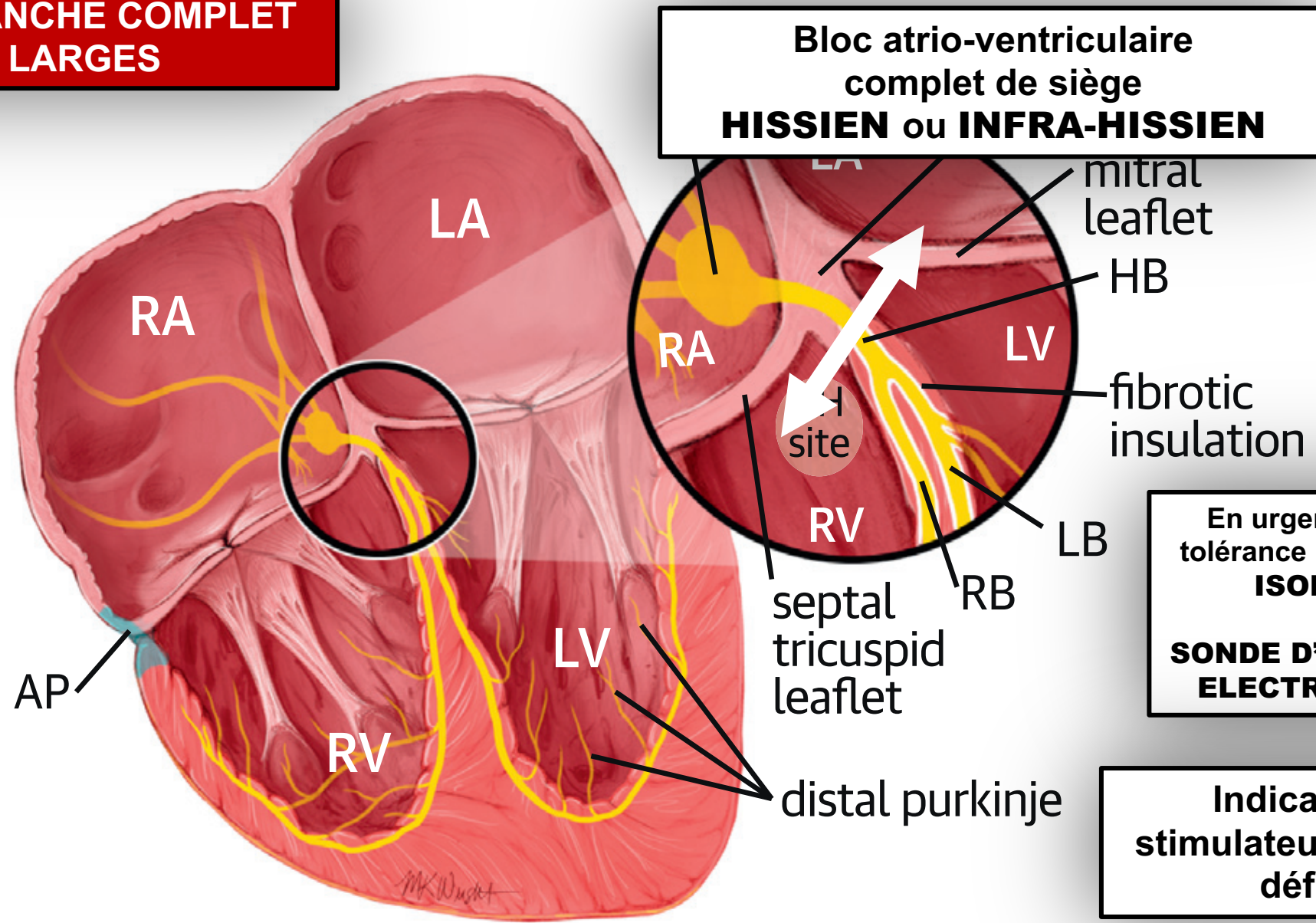


**Bloc atrio-ventriculaire
complet de siège
HISSIEN ou INFRA-HISSIEN**

En urgence (si mauvaise
tolérance hémodynamique) :
ISOPRENALINE
ou
**SONDE D'ENTRAINEMENT
ELECTROSYSTOLIQUE**

**Indication de
stimulateur cardiaque
définitif**

**BLOC DE BRANCHE COMPLET
A QRS LARGES**

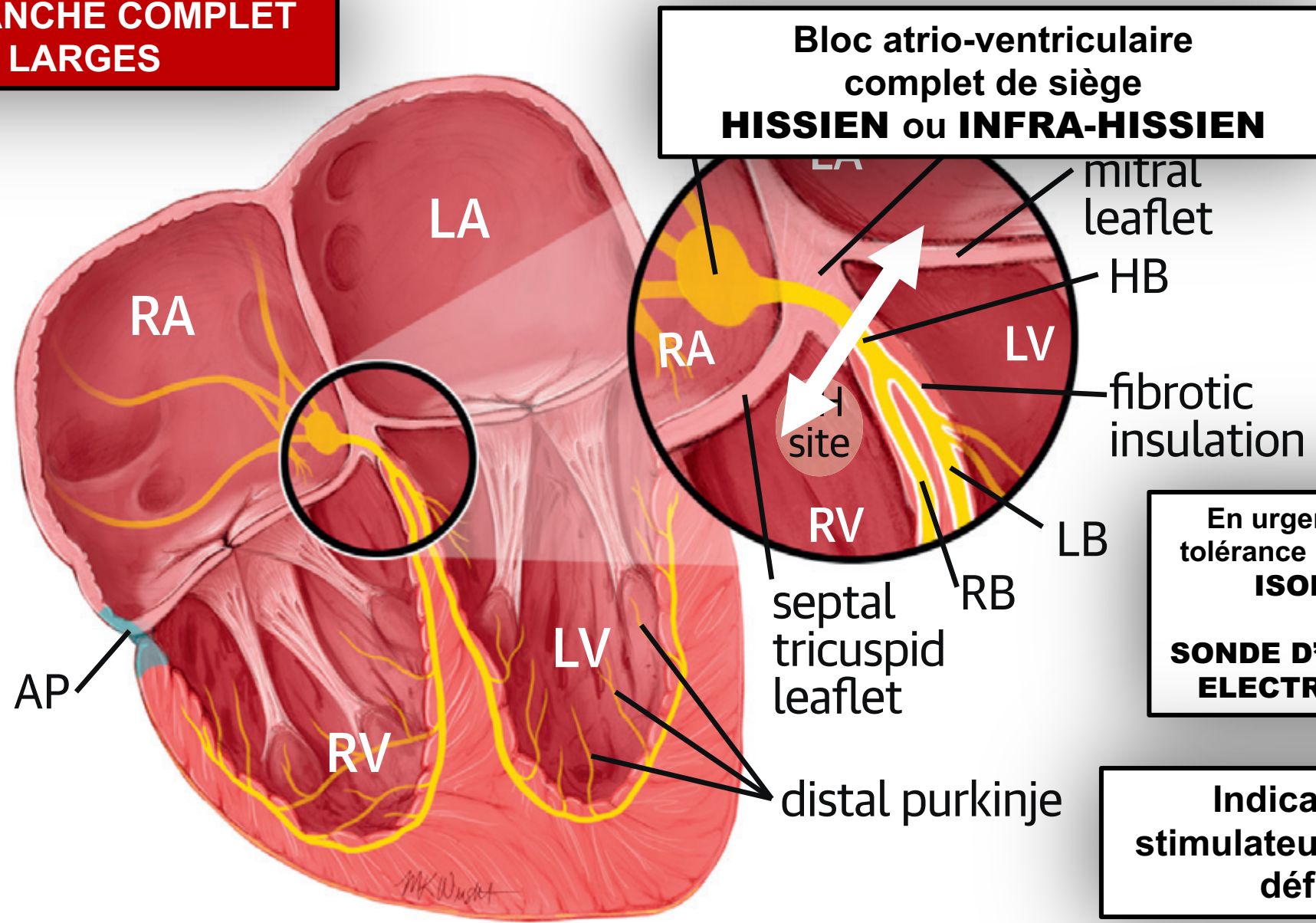


**Bloc atrio-ventriculaire
complet de siège
HISSIEN ou INFRA-HISSIEN**

En urgence (si mauvaise tolérance hémodynamique) :
ISOPRENALINE
ou
SONDE D'ENTRAINEMENT ELECTROSYSTOLIQUE

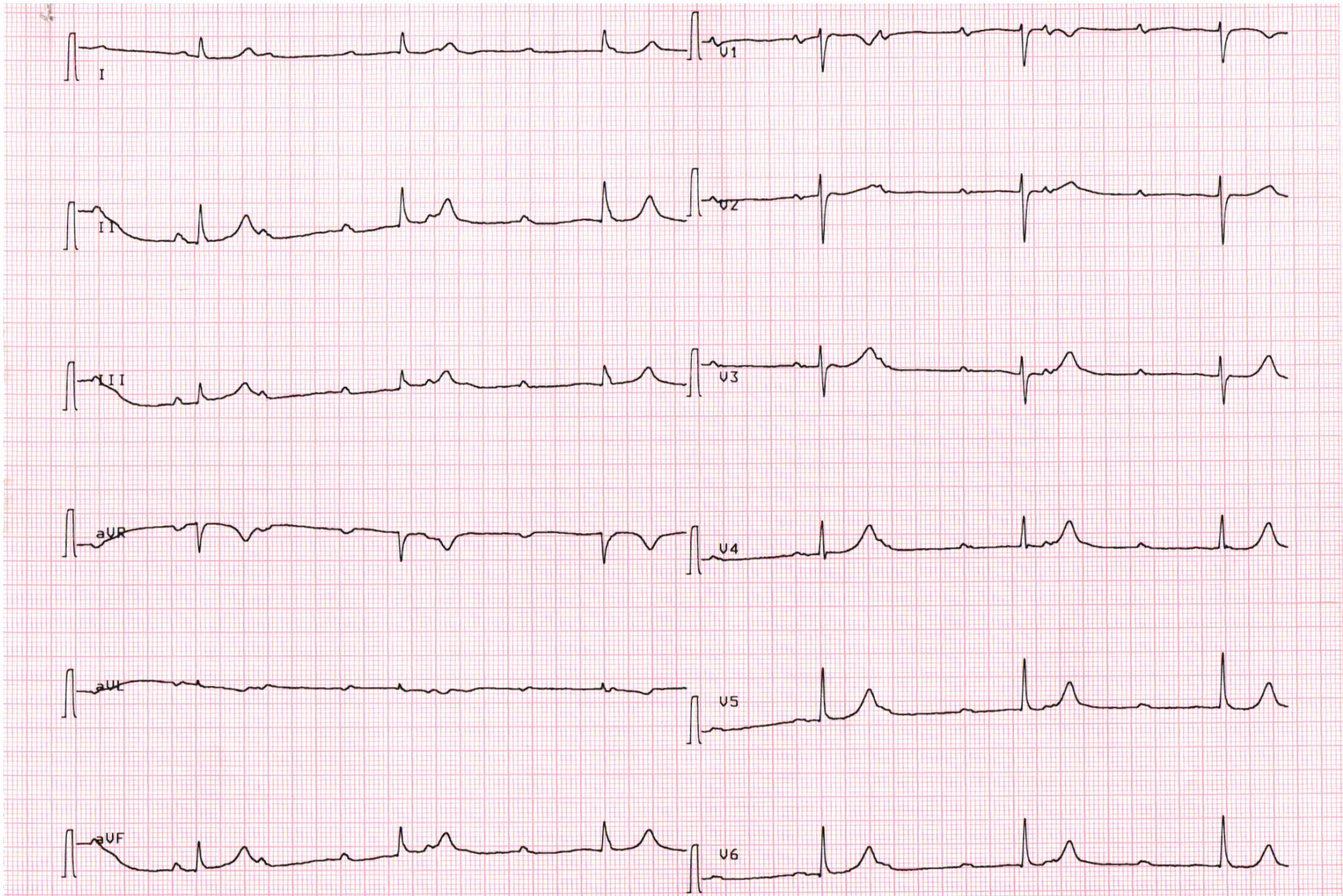
Indication de stimulateur cardiaque définitif

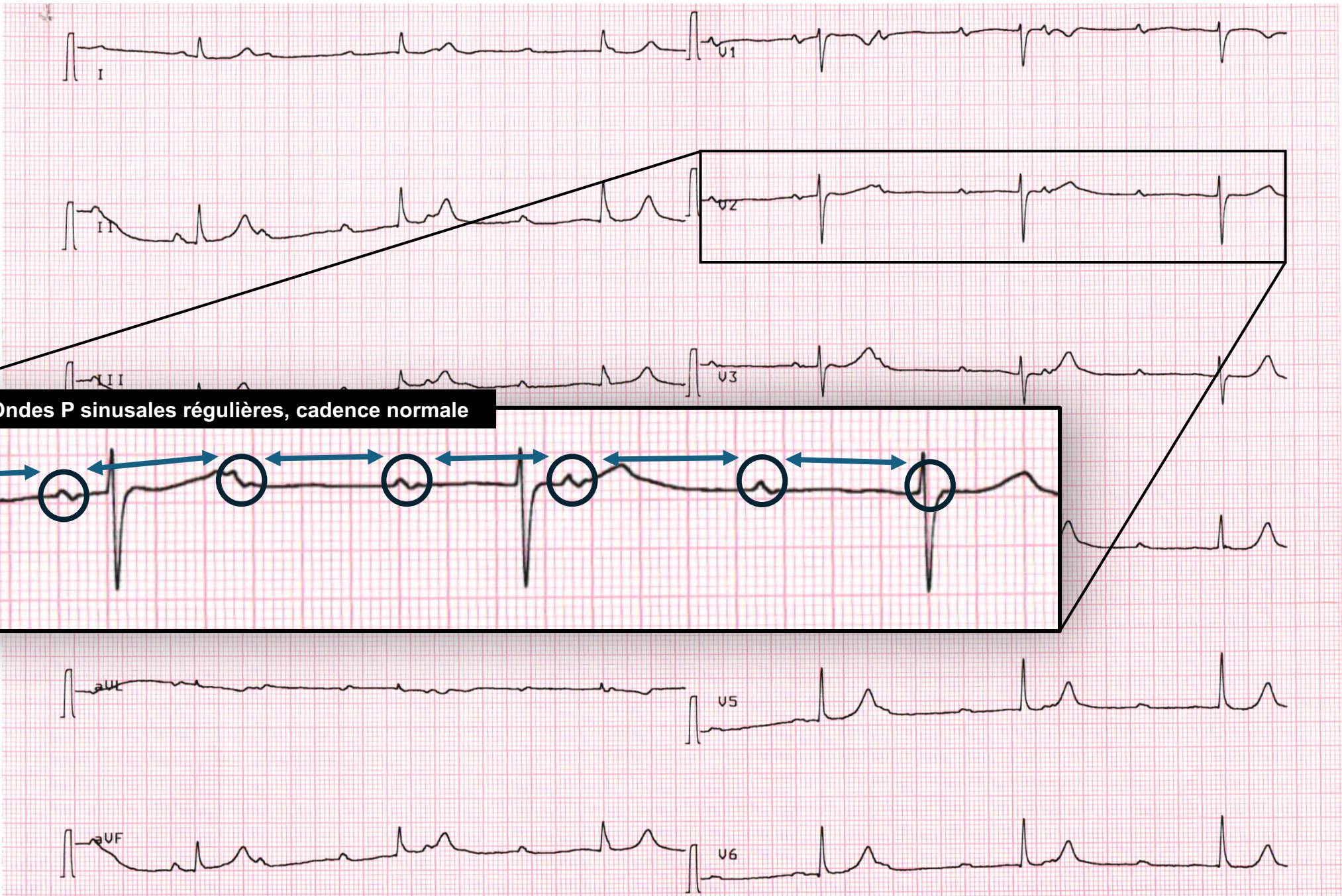
**BLOC DE BRANCHE COMPLET
A QRS LARGES**

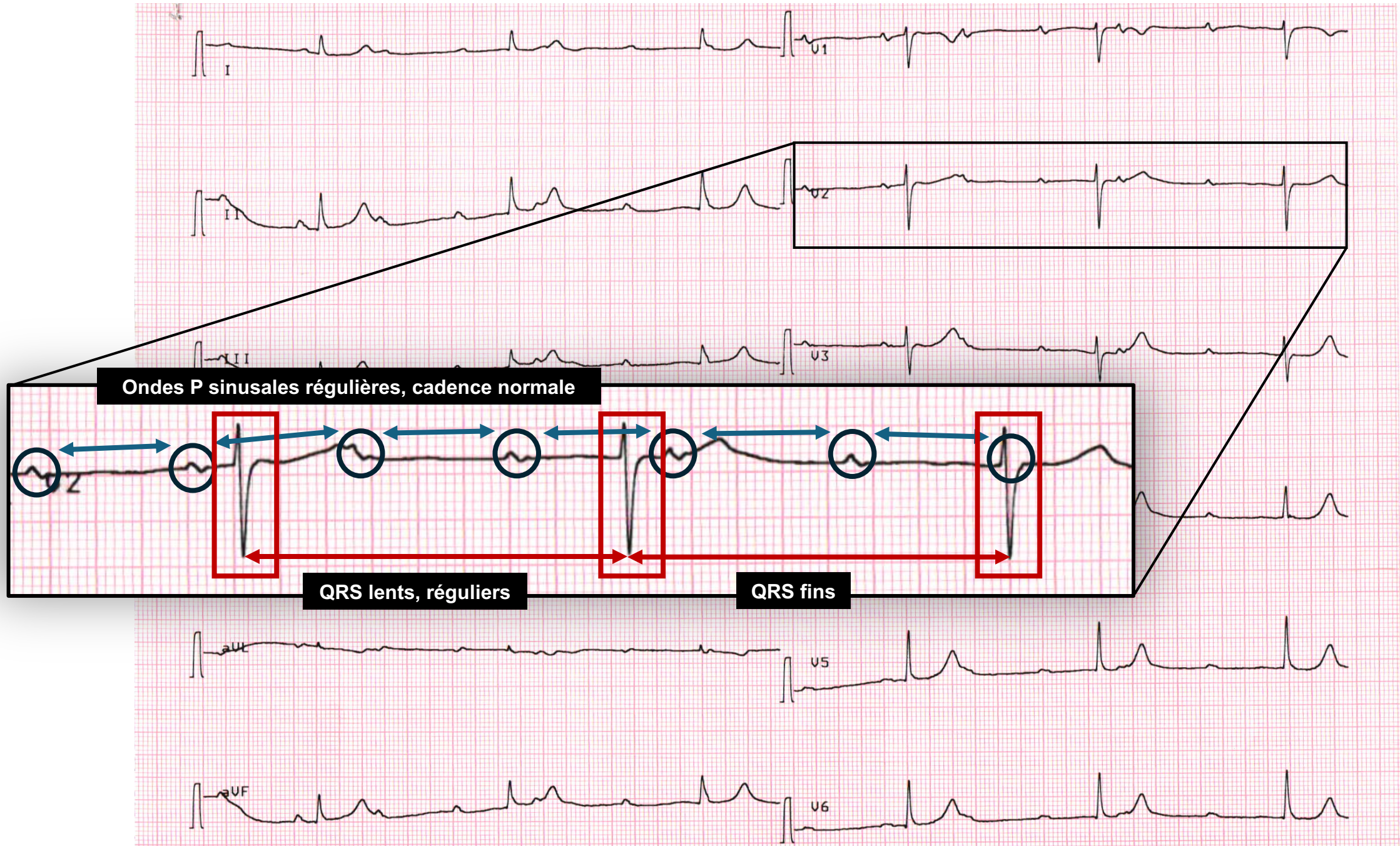


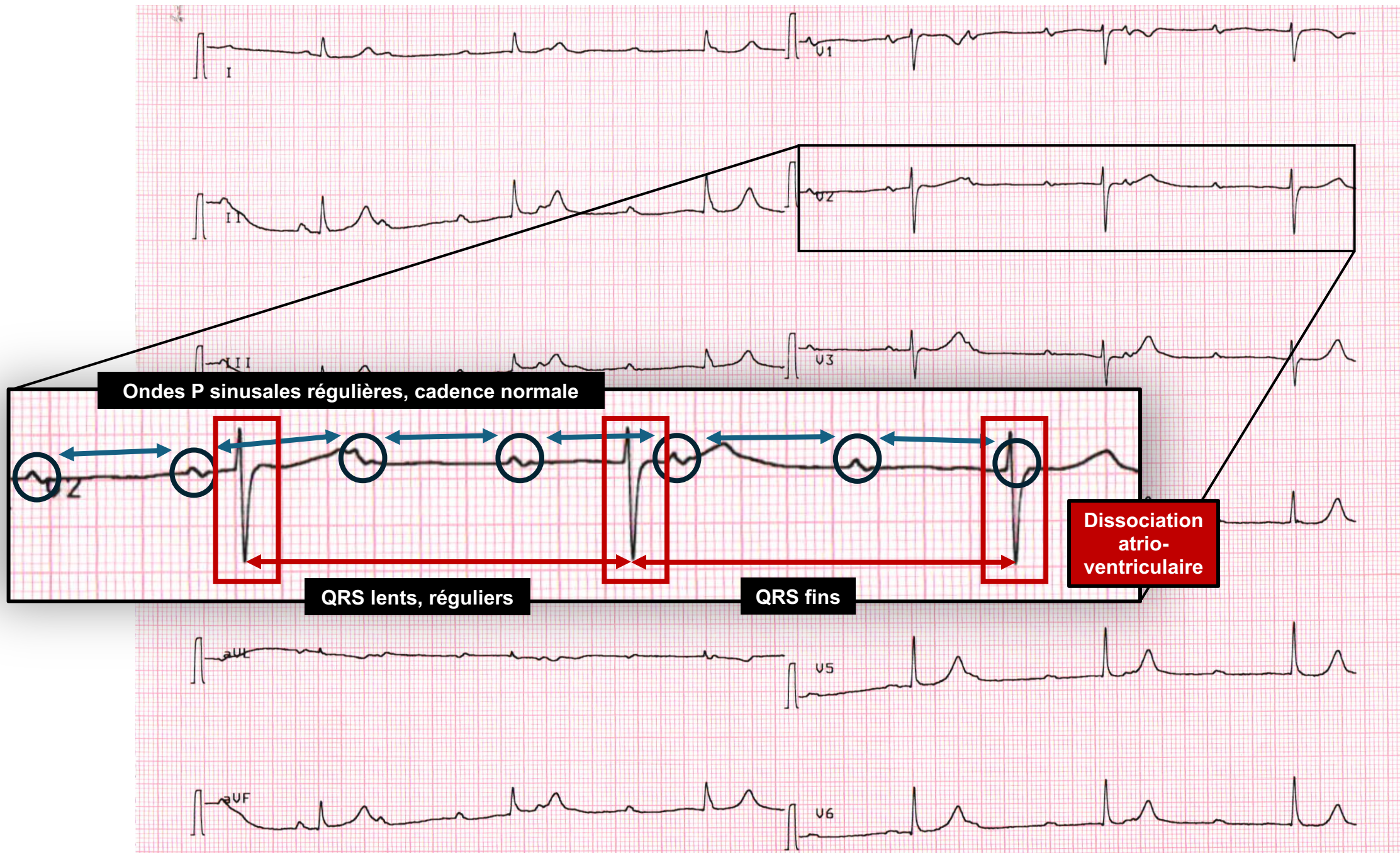
En urgence (si mauvaise tolérance hémodynamique) :
ISOPRENALINE
ou
SONDE D'ENTRAINEMENT ELECTROSYSTOLIQUE

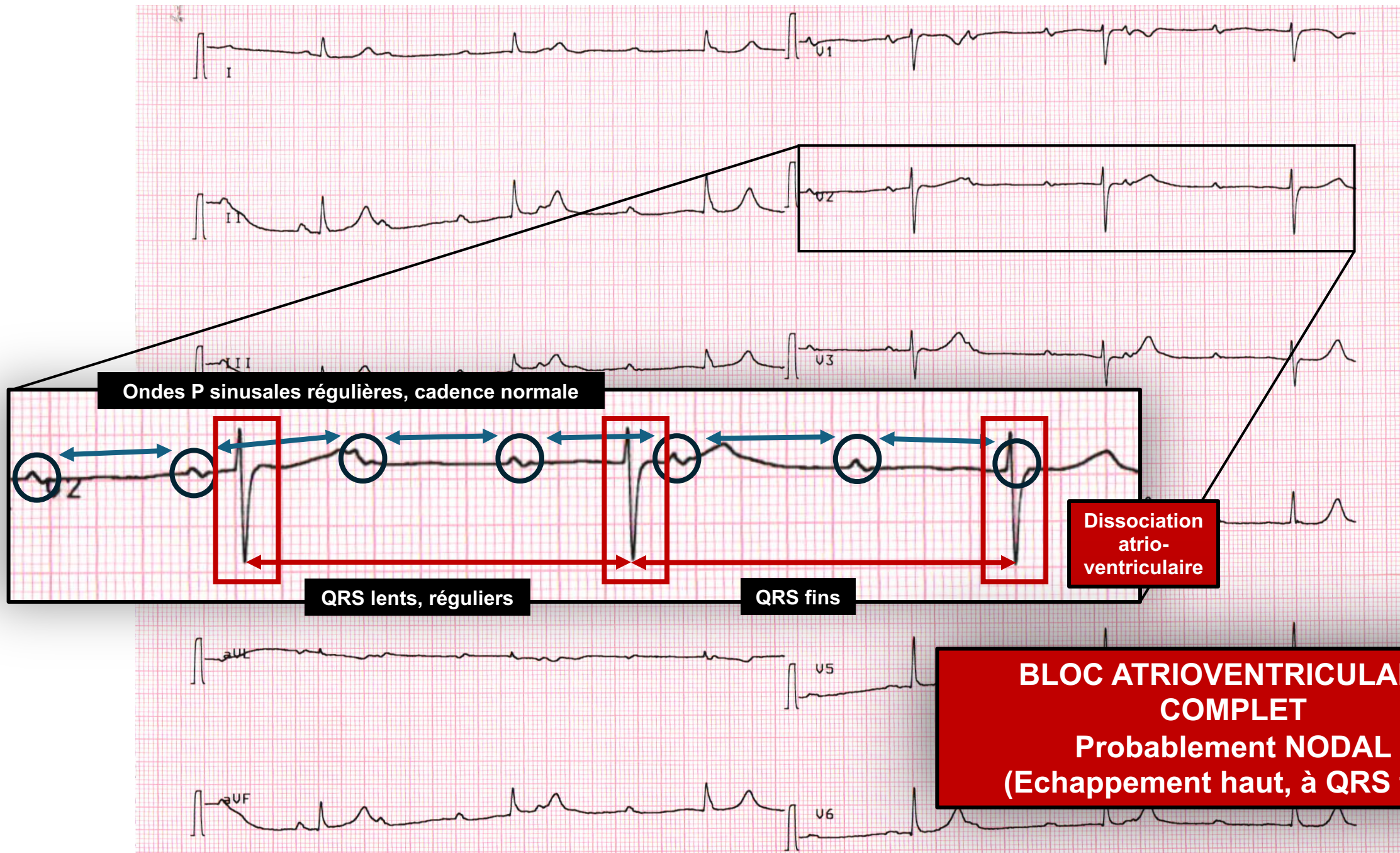
Indication de stimulateur cardiaque définitif



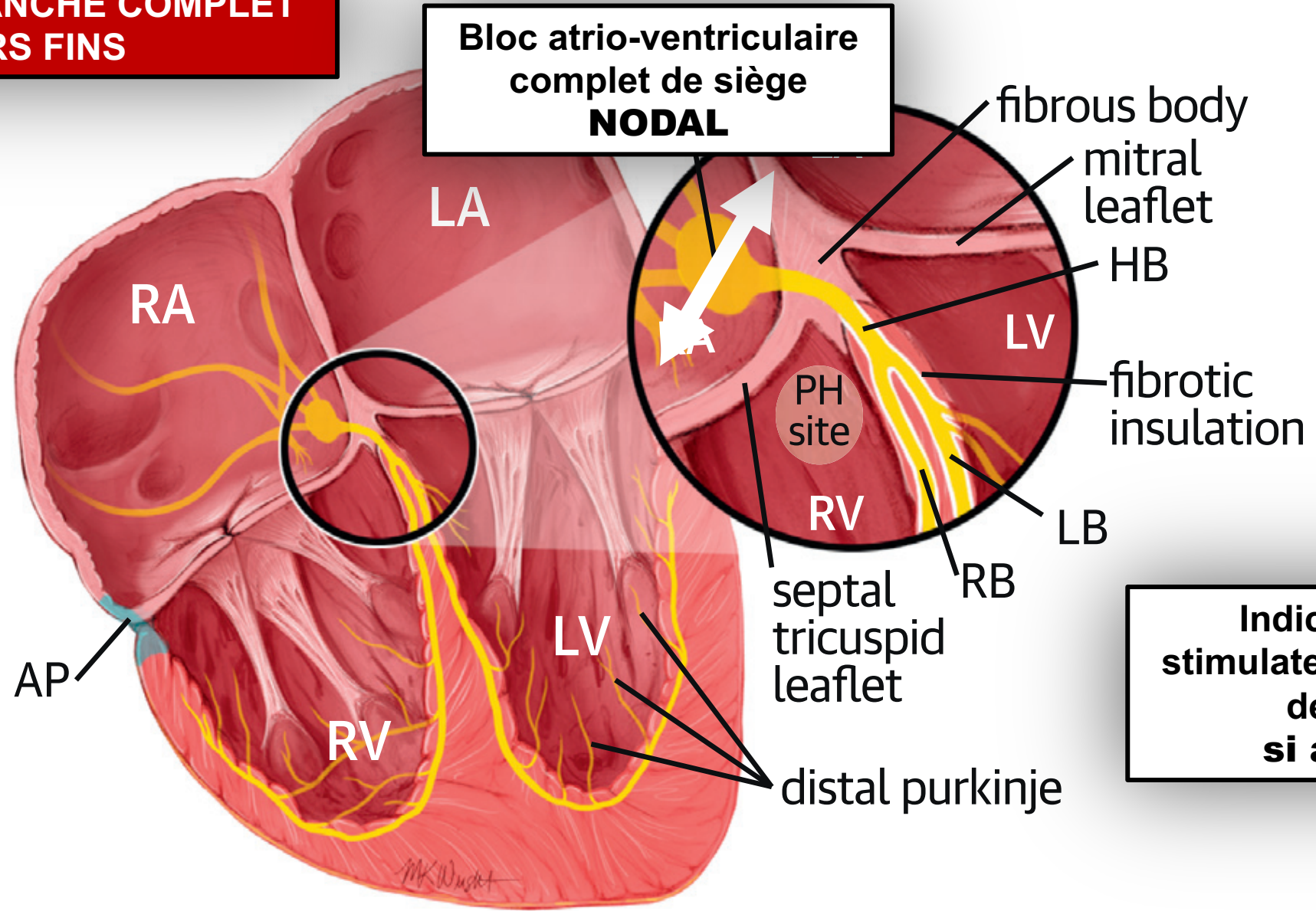


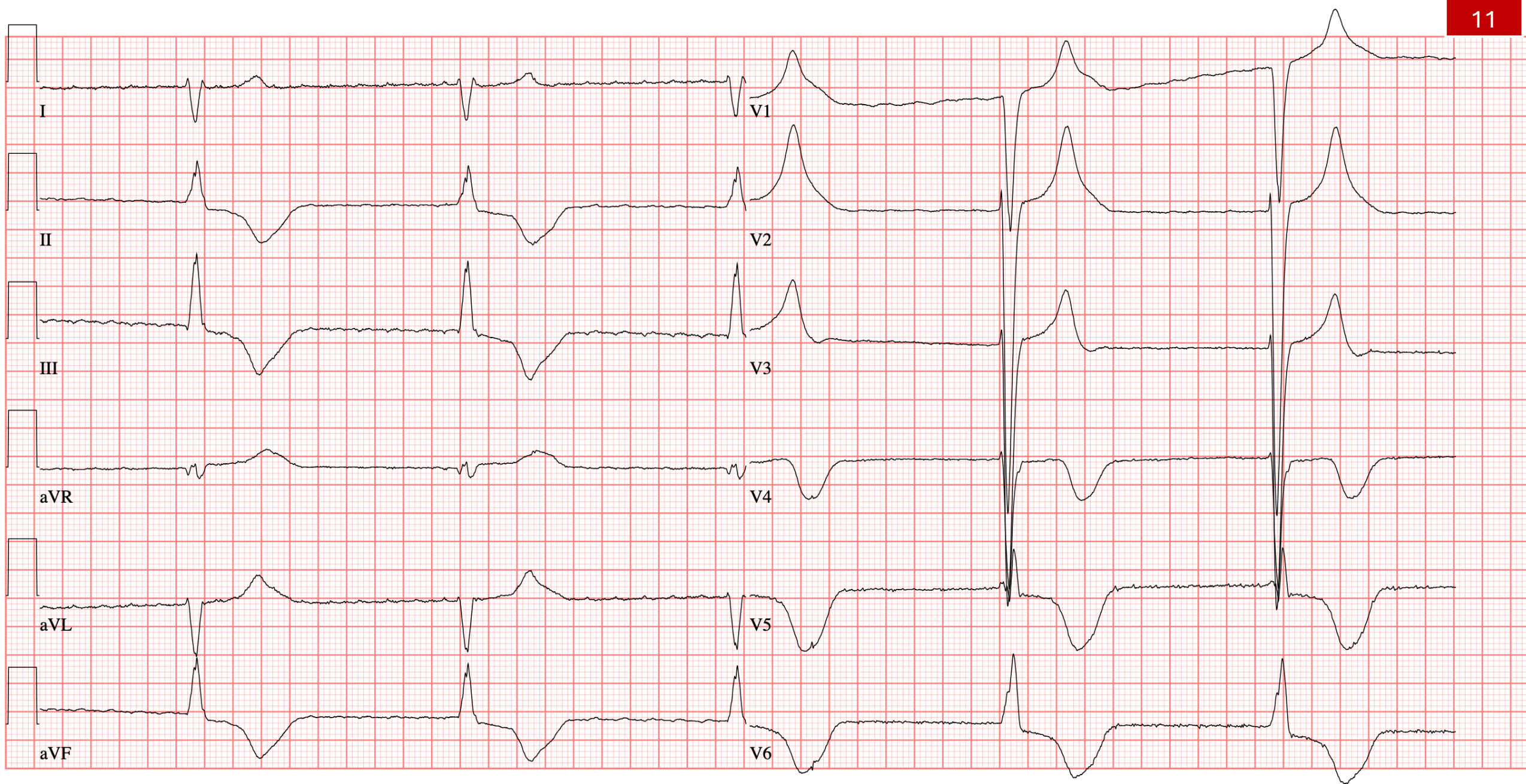


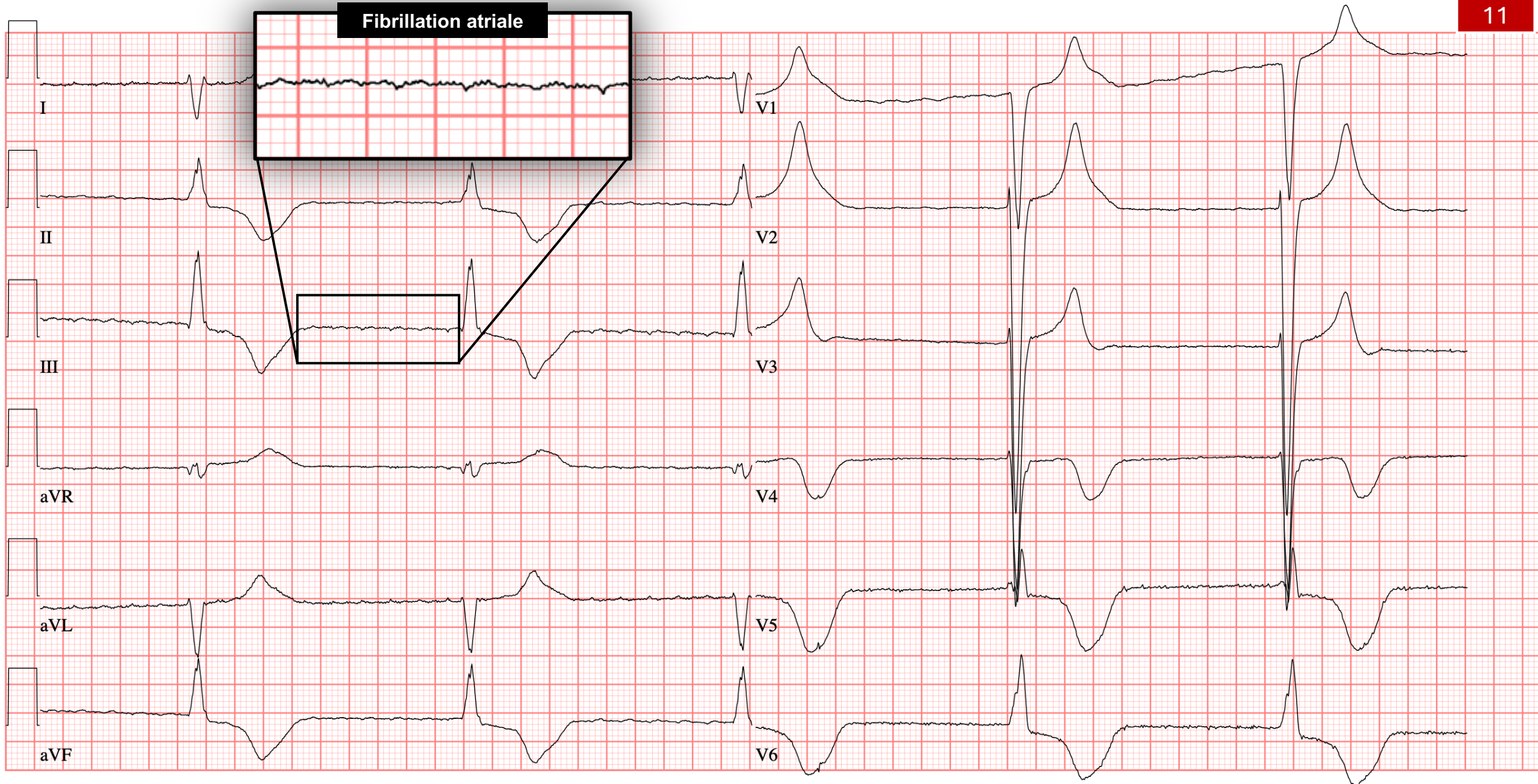


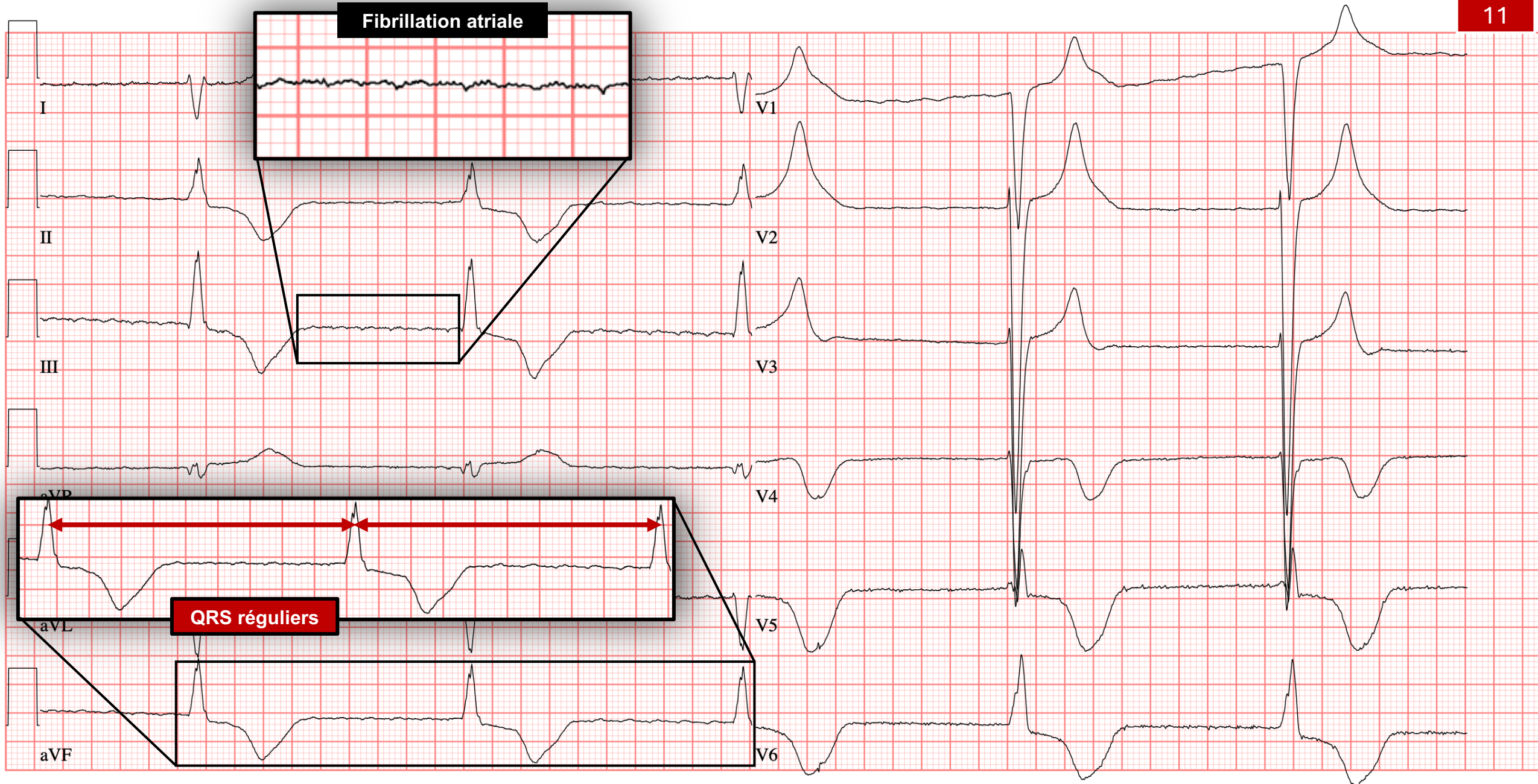


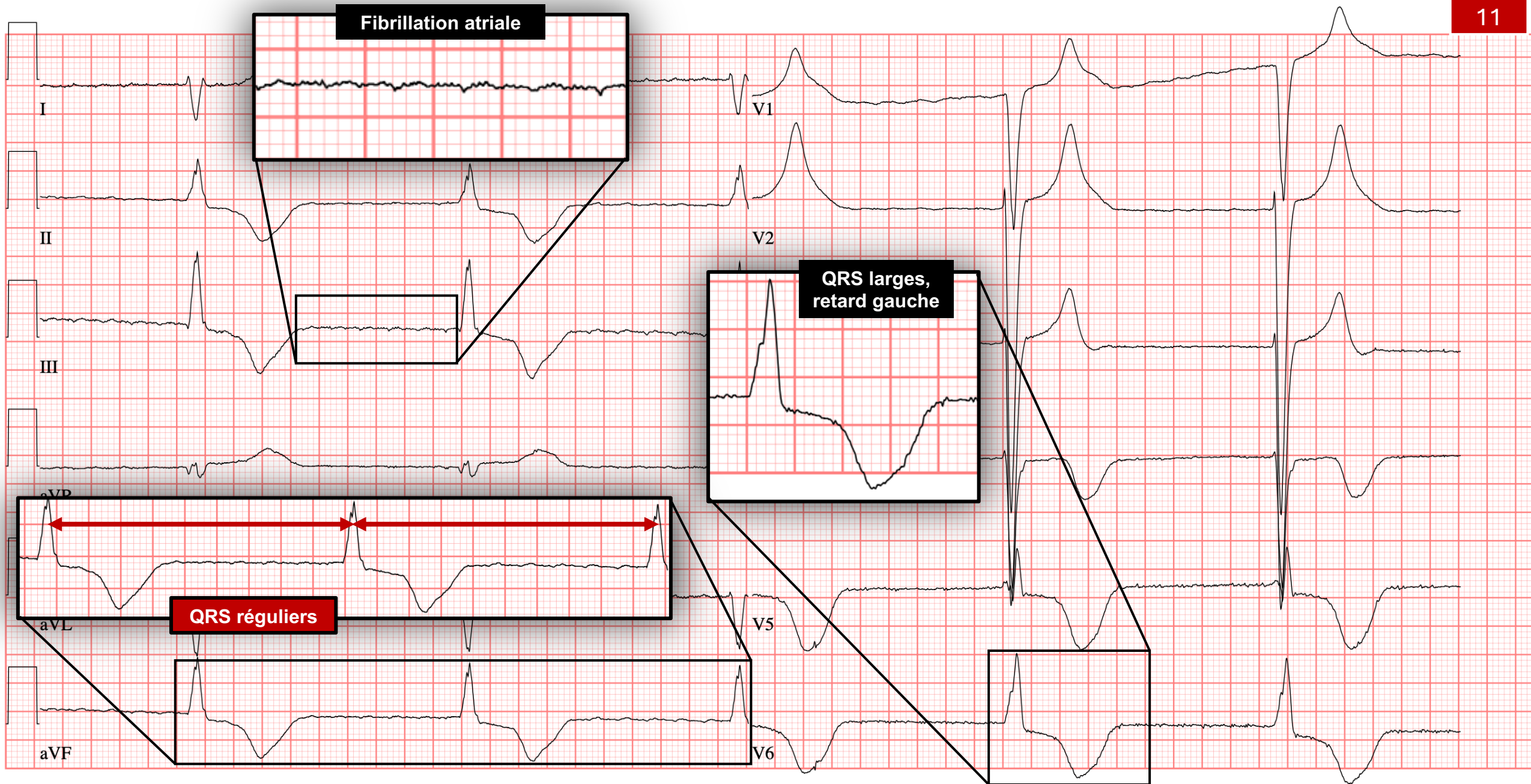
**BLOC DE BRANCHE COMPLET
A QRS FINS**

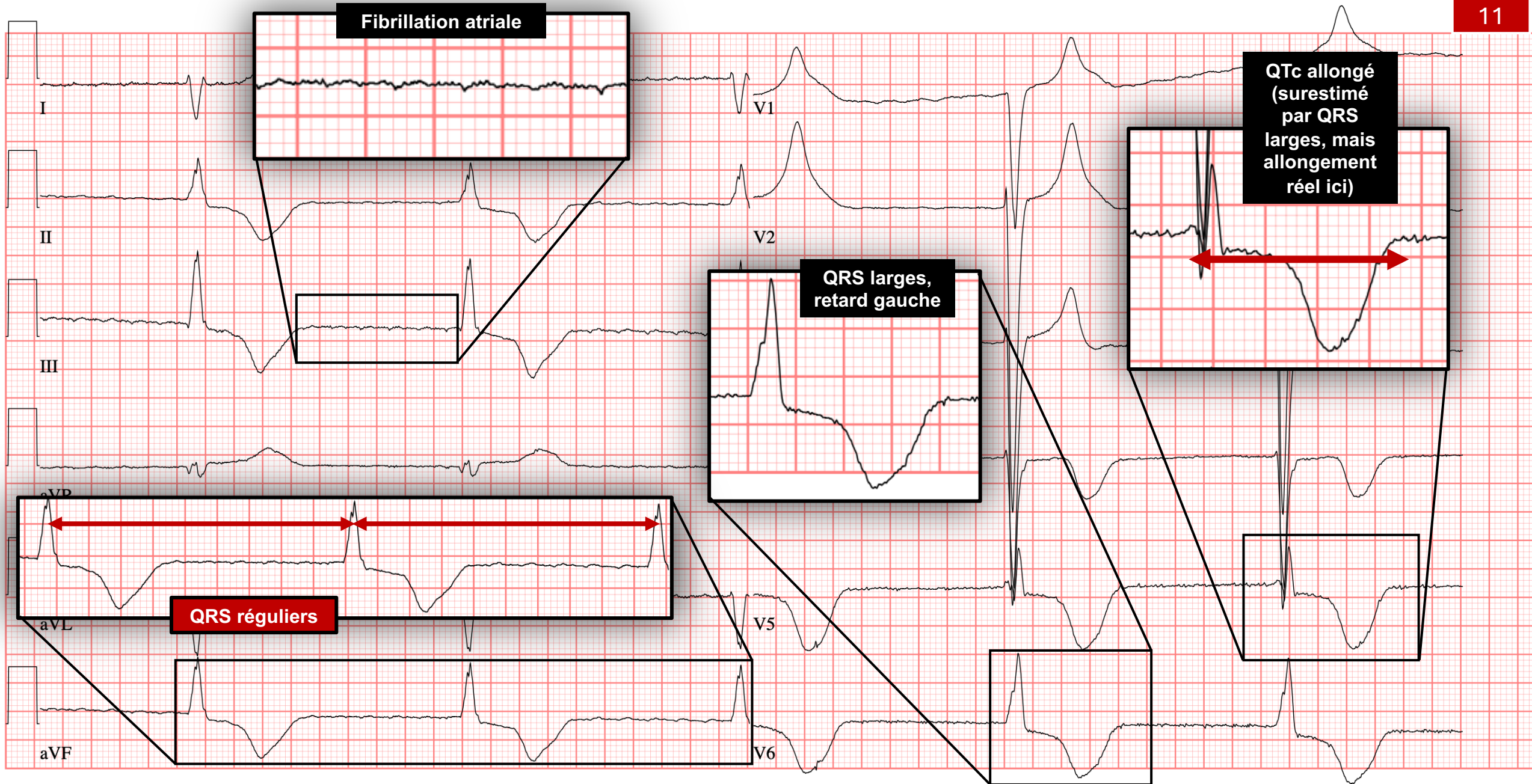






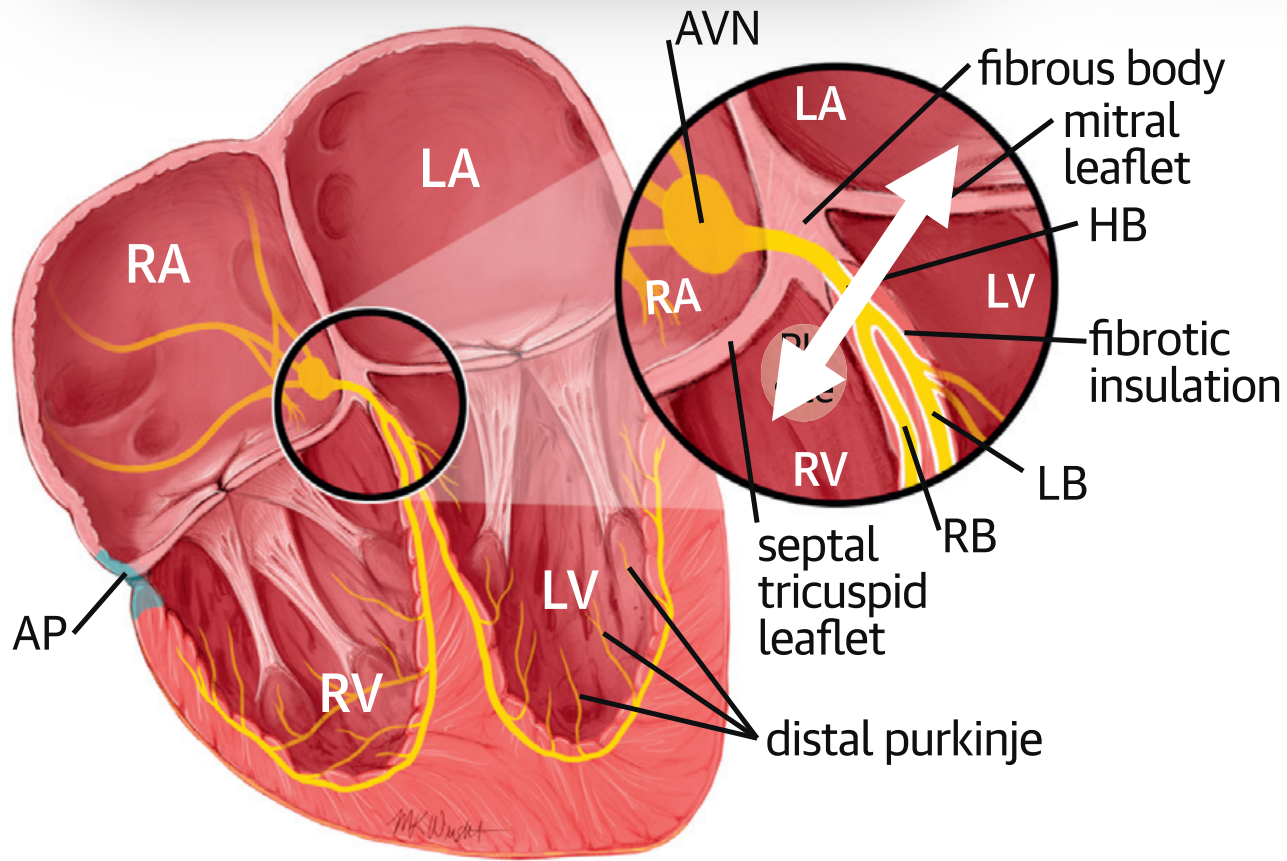




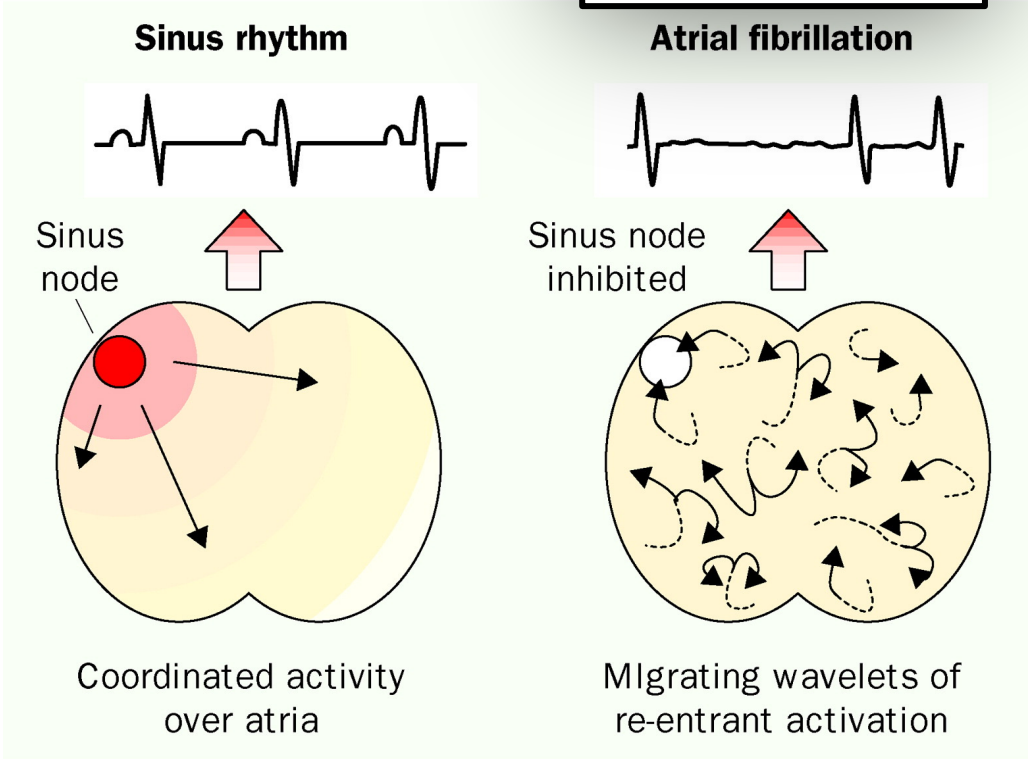


Bloc atrio-ventriculaire complet de siège HISSIEN ou INFRA-HISSIEN

BAV complet régulier : Pensez à la fibrillation atriale !



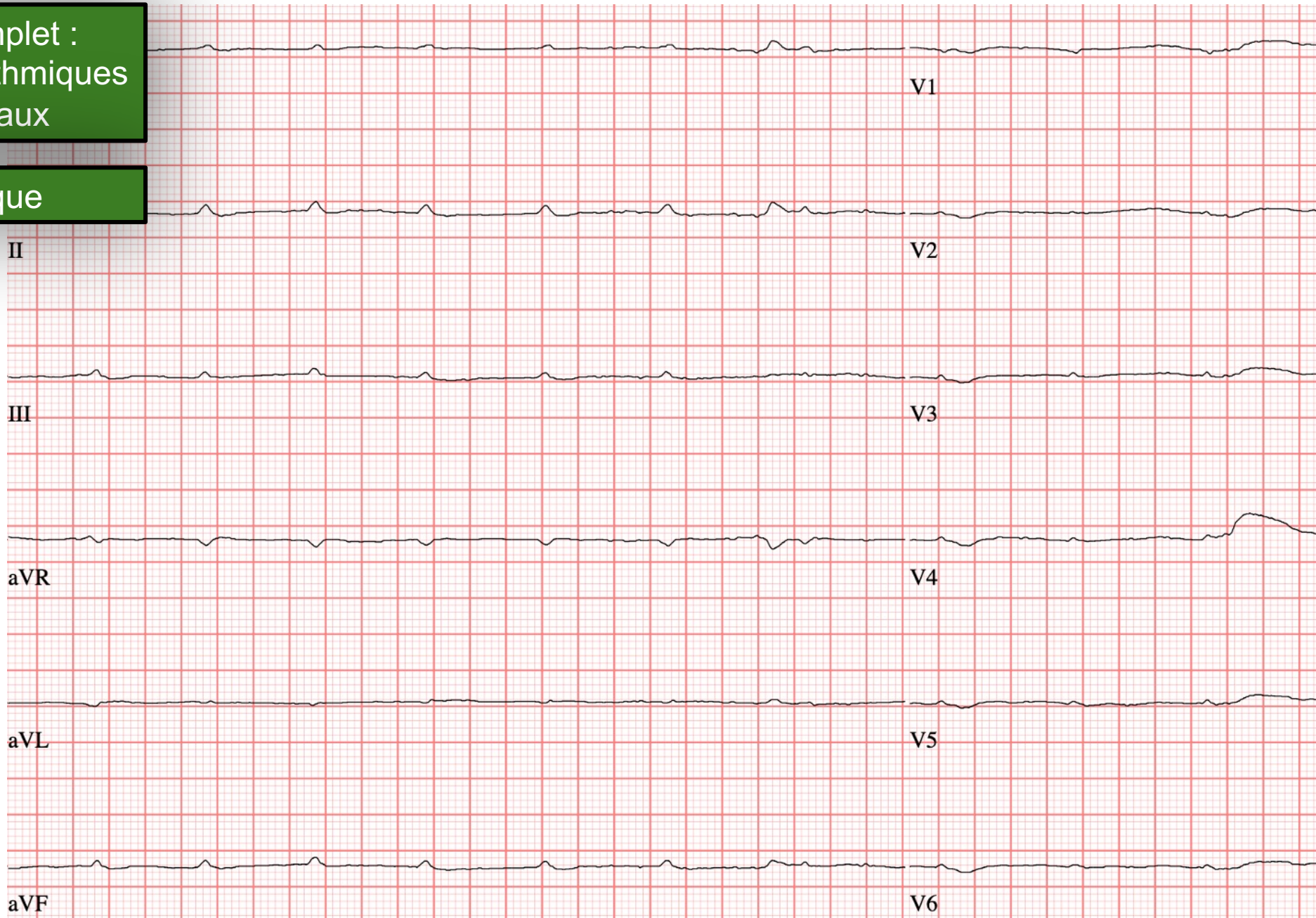
Fibrillation atriale



Narayan SM et al. The Lancet. 1997

BAV complet :
2 risques rythmiques
principaux

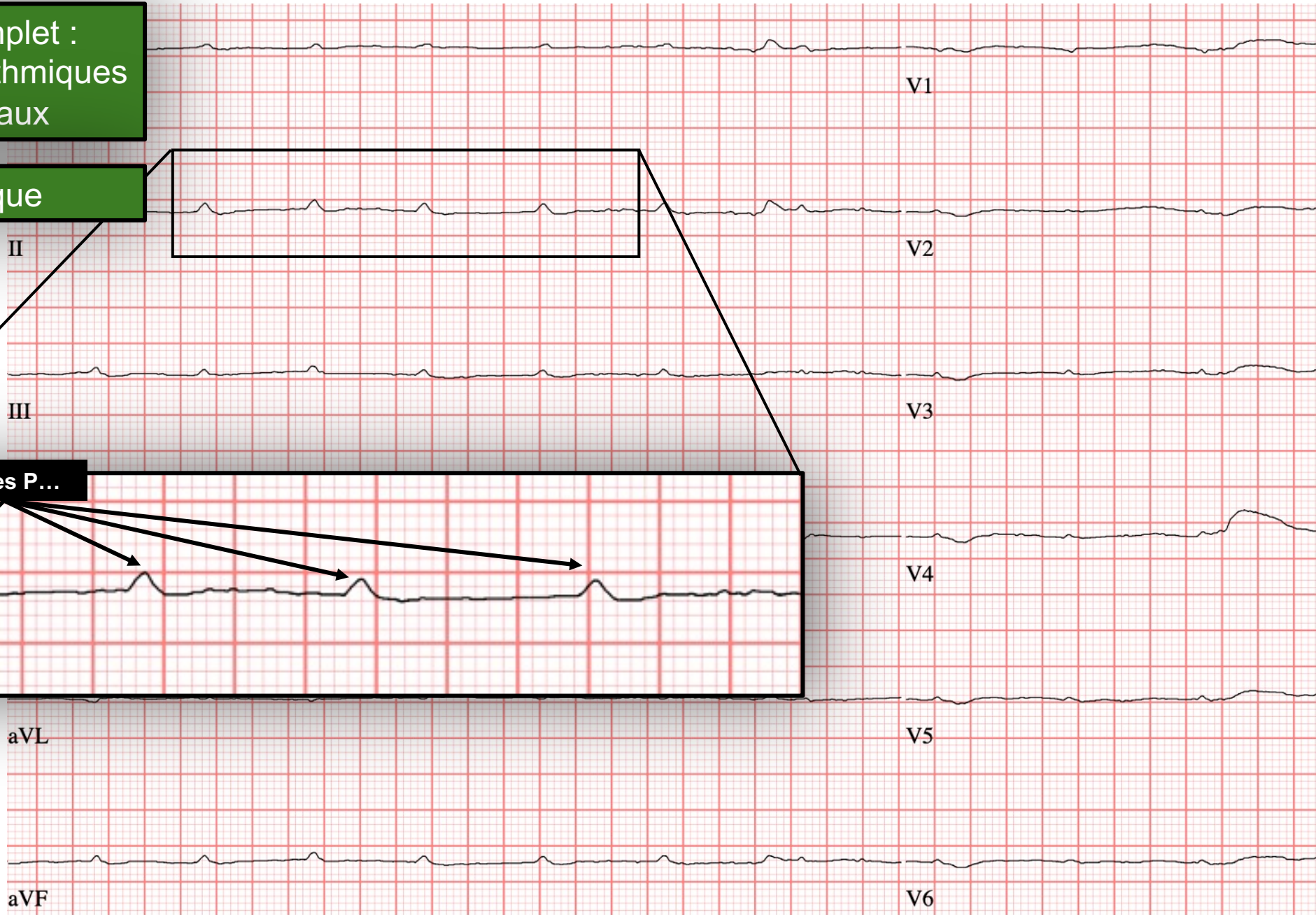
1^{er} risque



BAV complet :
2 risques rythmiques
principaux

1^{er} risque

Ondes P...

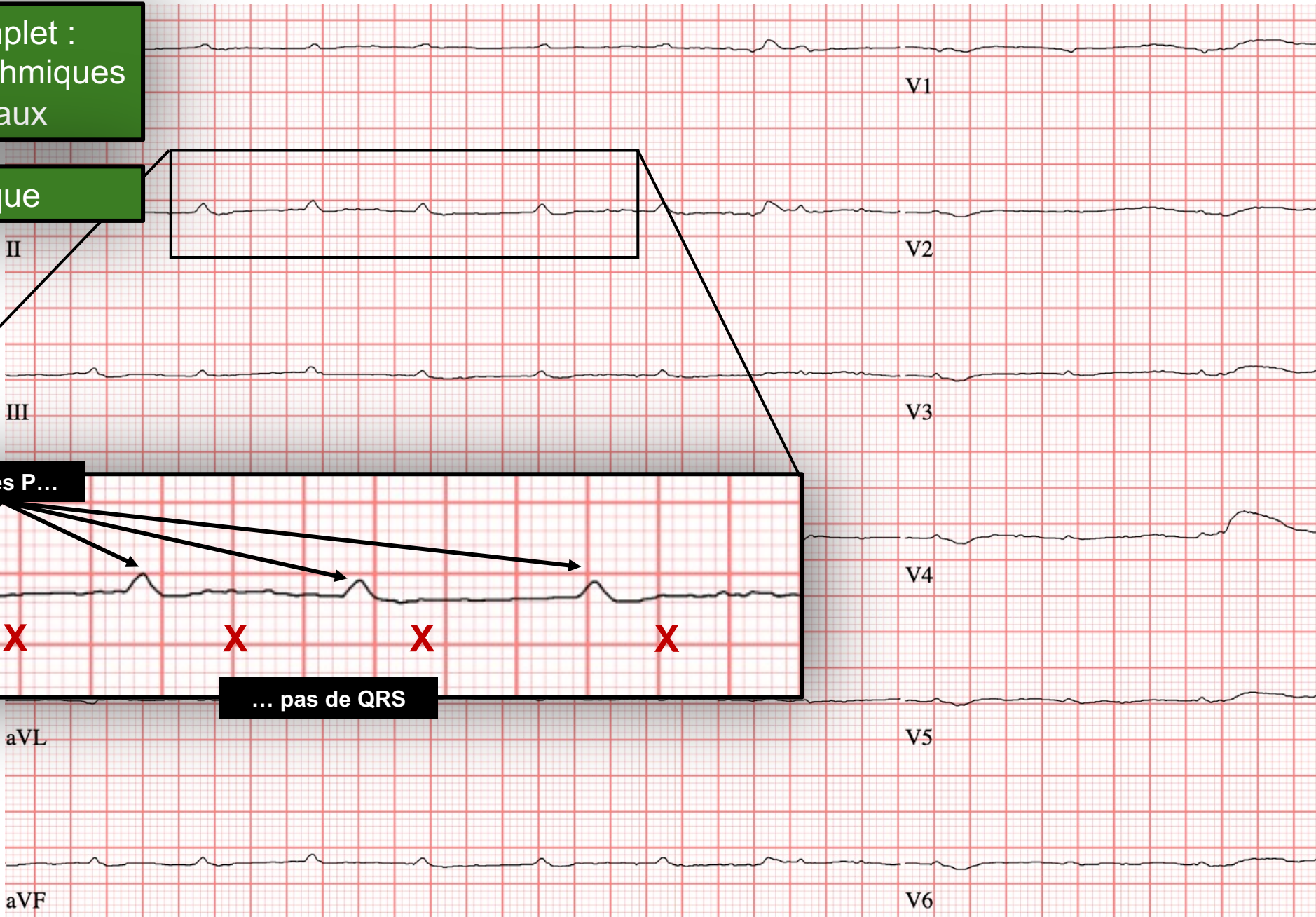


BAV complet :
2 risques rythmiques
principaux

1^{er} risque

Ondes P...

... pas de QRS



BAV complet :
2 risques rythmiques
principaux

1^{er} risque

II

III

Ondes P...

X

X

X

X

... pas de QRS

aVL

aVF

V1

V2

V3

V4

V5

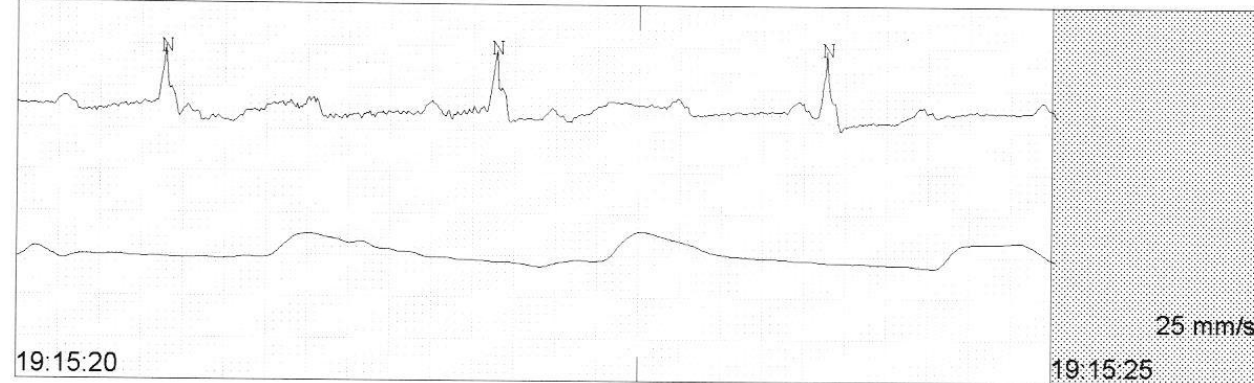
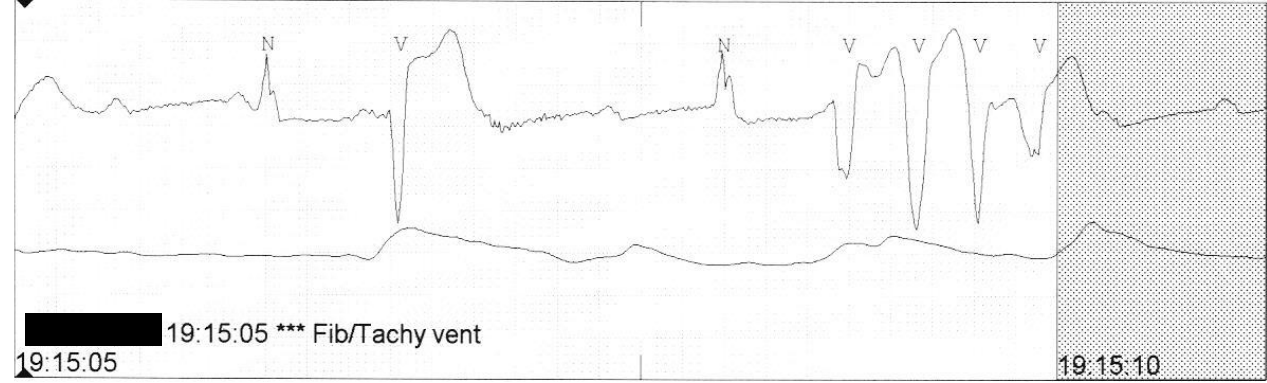
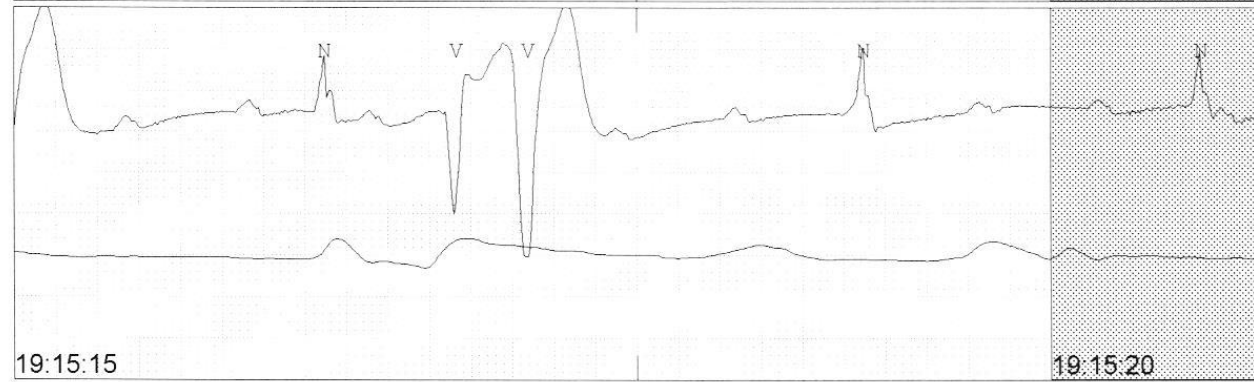
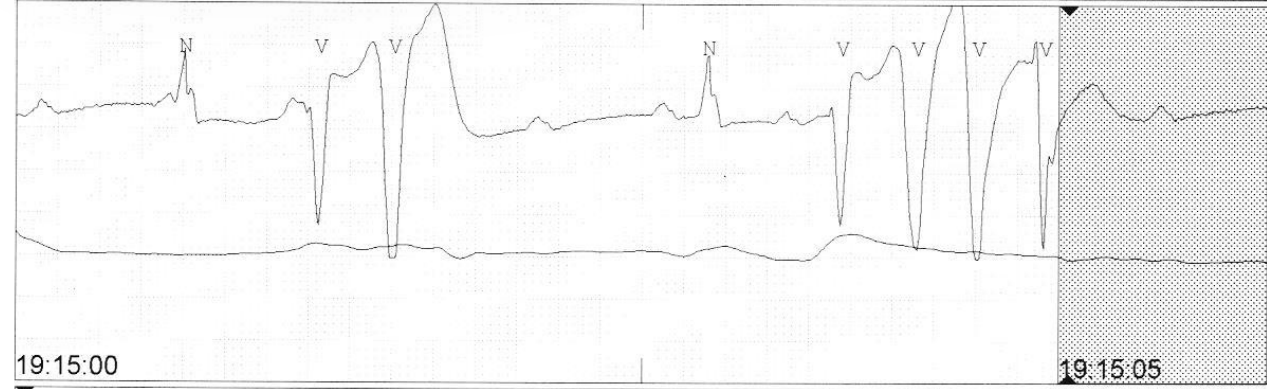
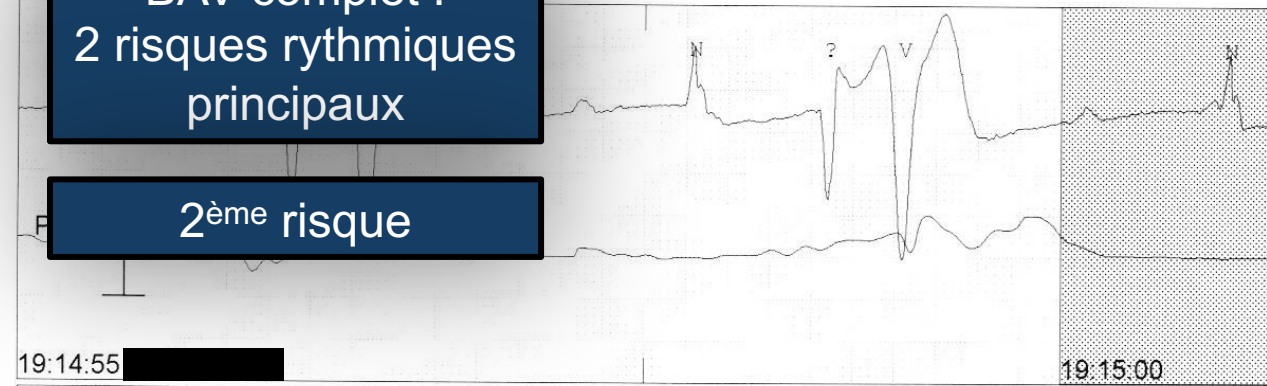
V6

ASYSTOLIE => ACR

- Urgence absolue
- Prise en charge de l'ACR
- Isoprénaline / SEES

BAV complet :
2 risques rythmiques
principaux

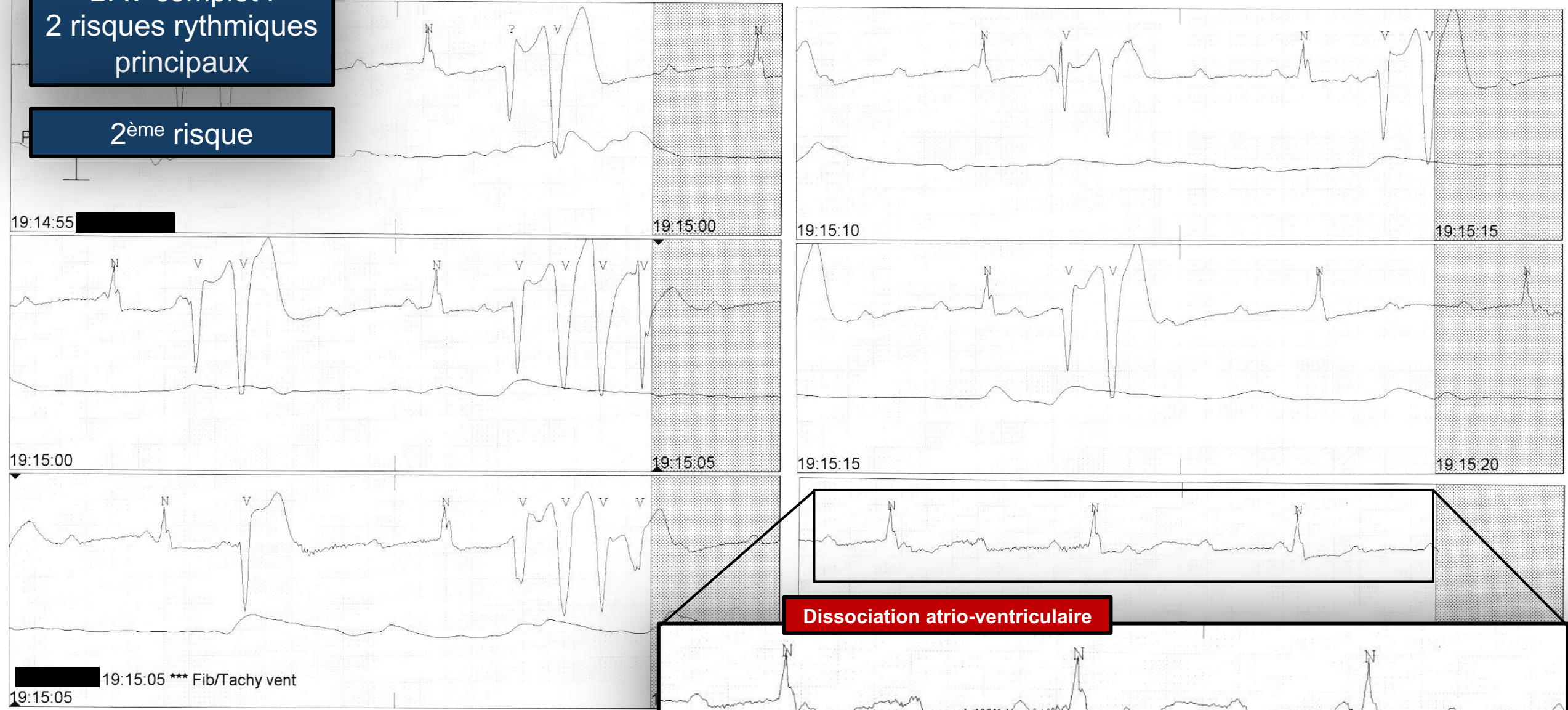
2^{ème} risque



25 mm/s

BAV complet :
2 risques rythmiques
principaux

2^{ème} risque

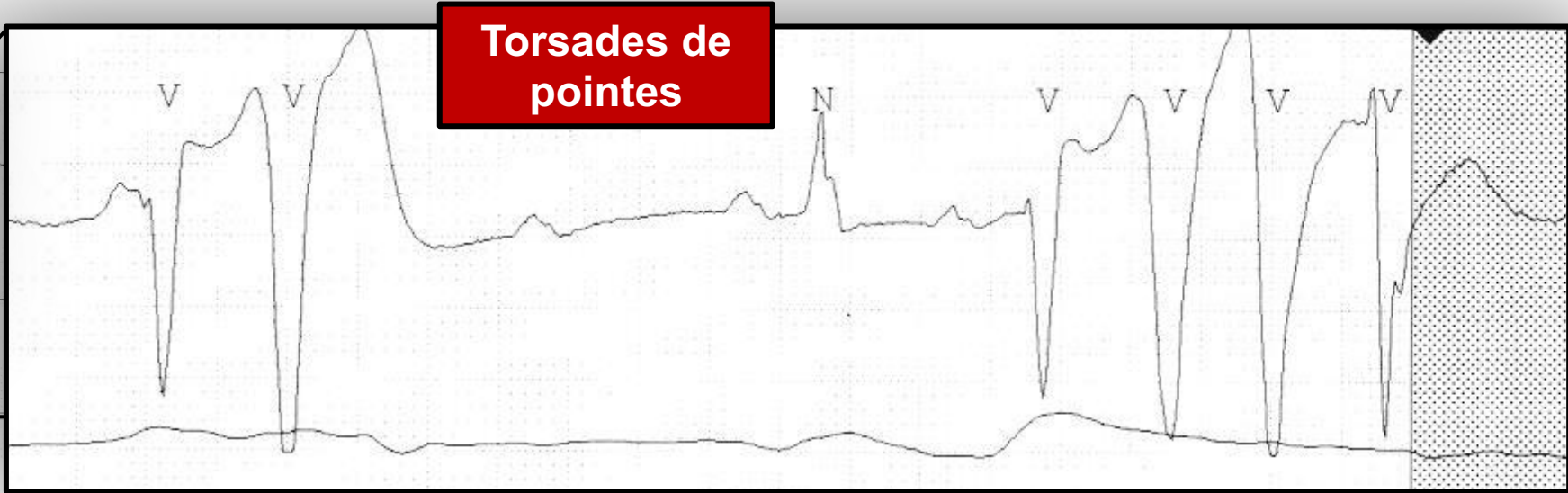


Dissociation atrio-ventriculaire

QRS d'échappement larges

BAV complet :
2 risques rythmiques
principaux

2^{ème} risque



19:14:55

5:15

19:15:00

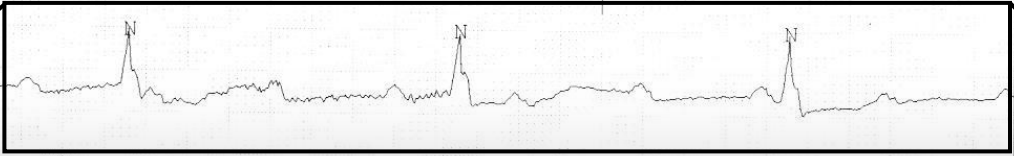
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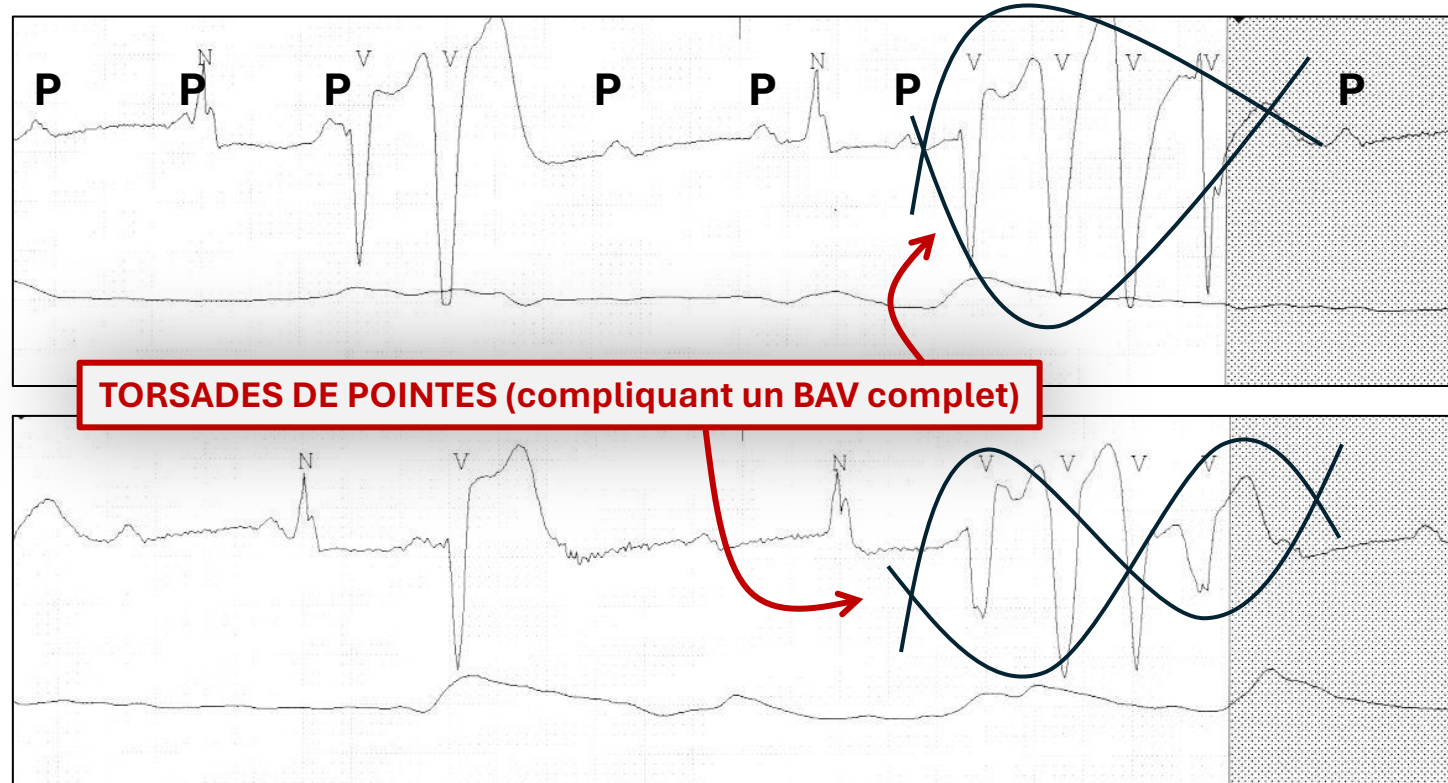
19:15:15

19:15:20

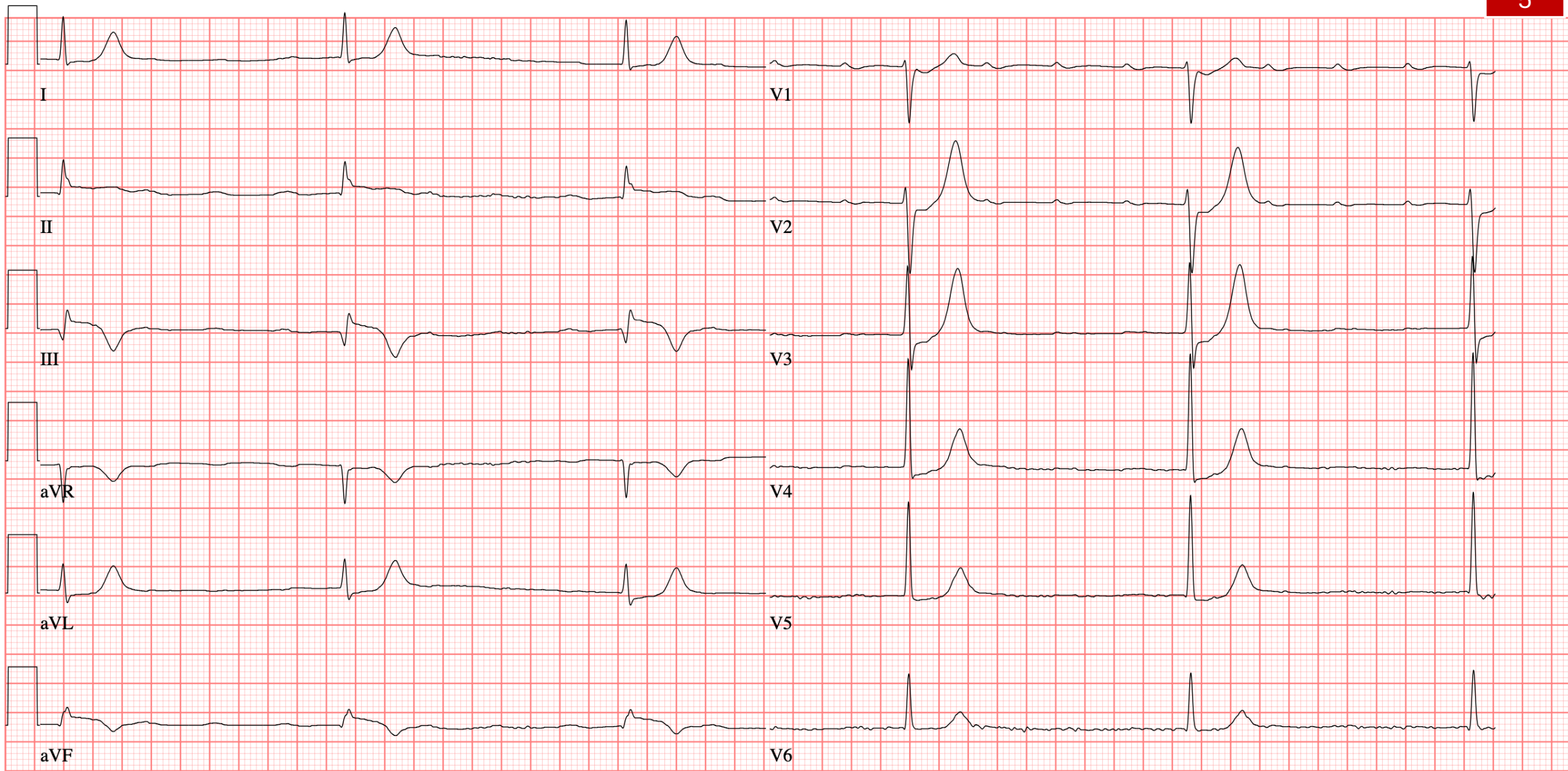
19:15:05 *** Fib/Tachy vent

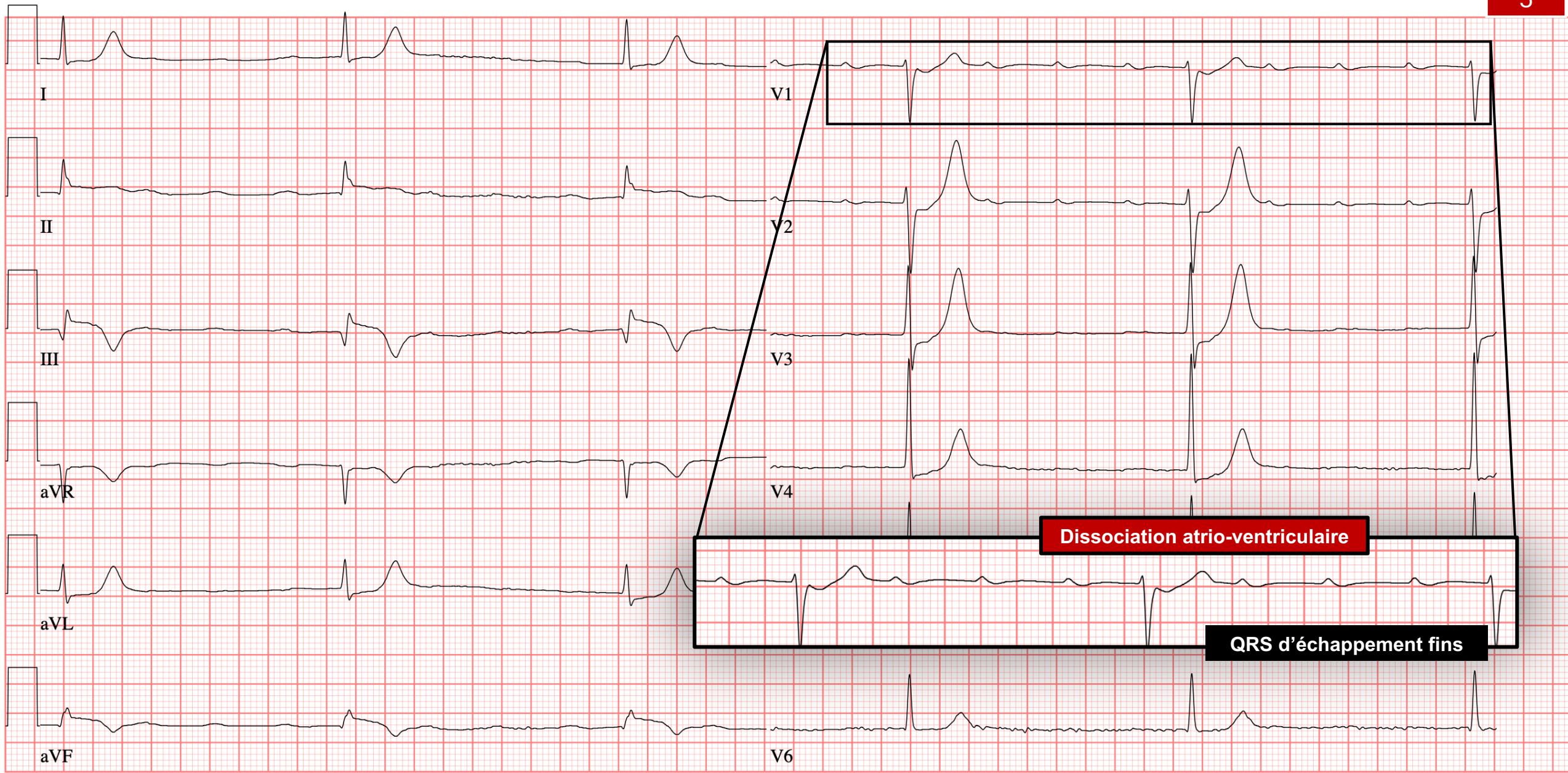
19:15:05

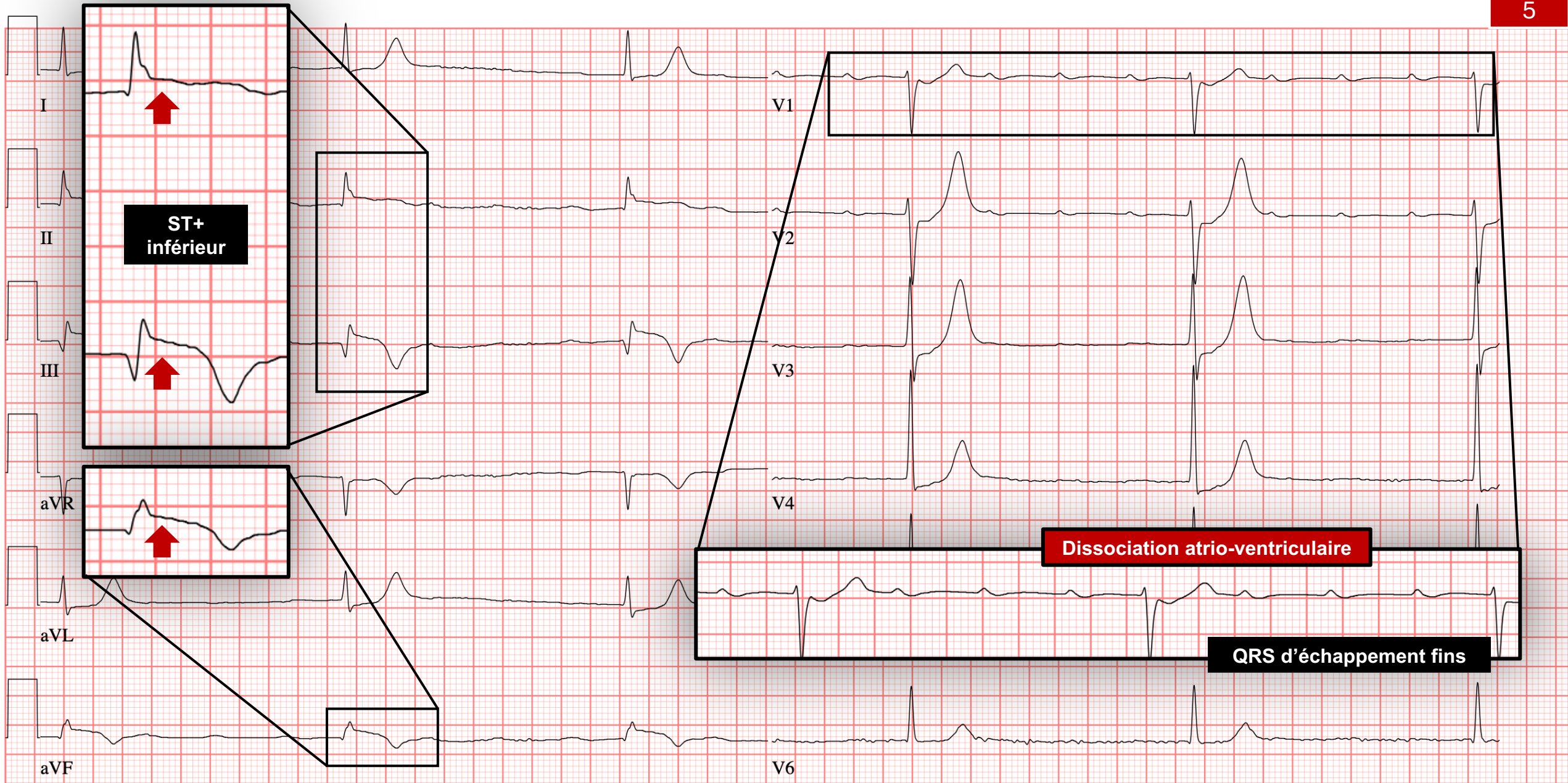


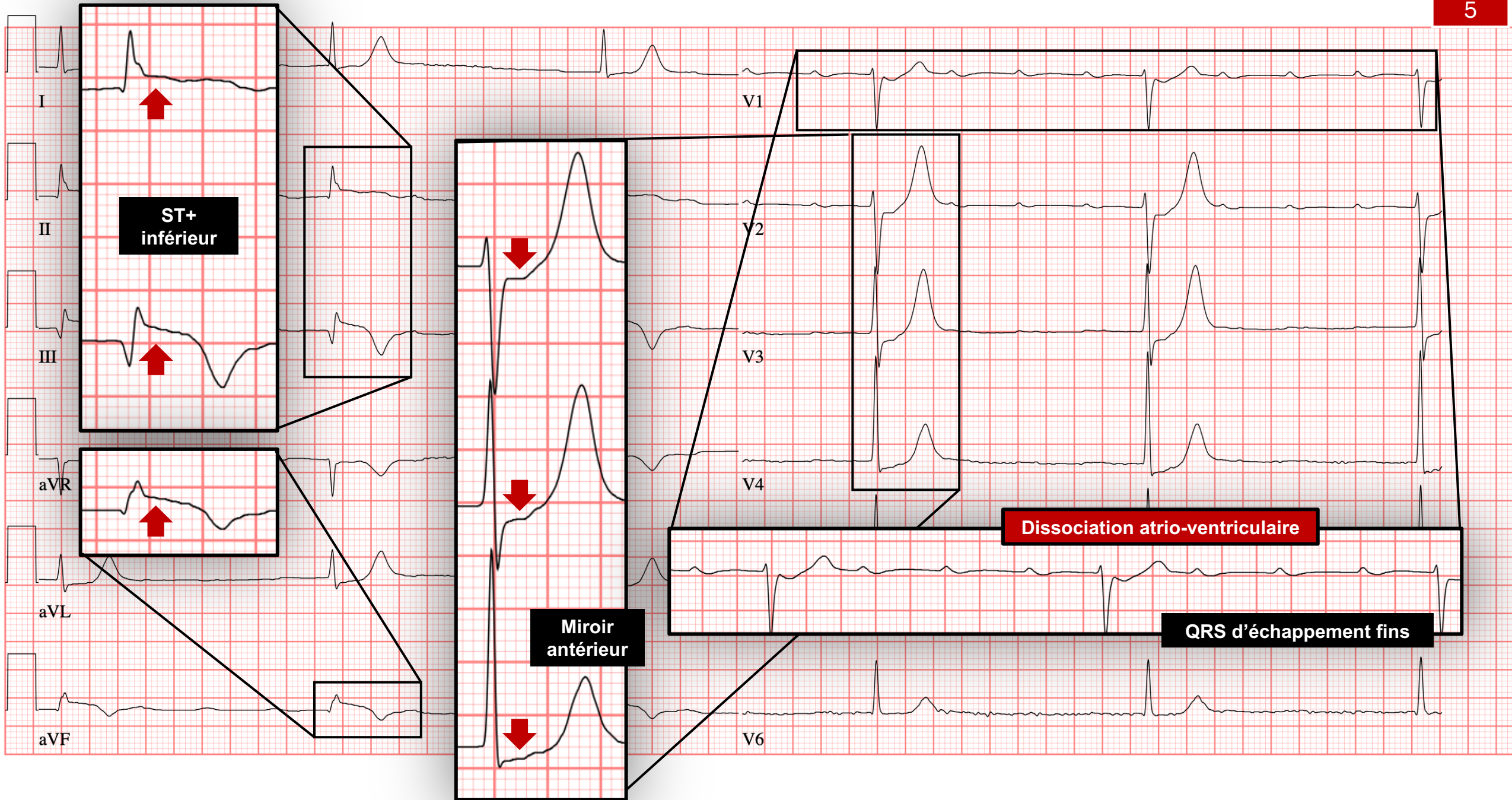
**PRISE EN CHARGE**

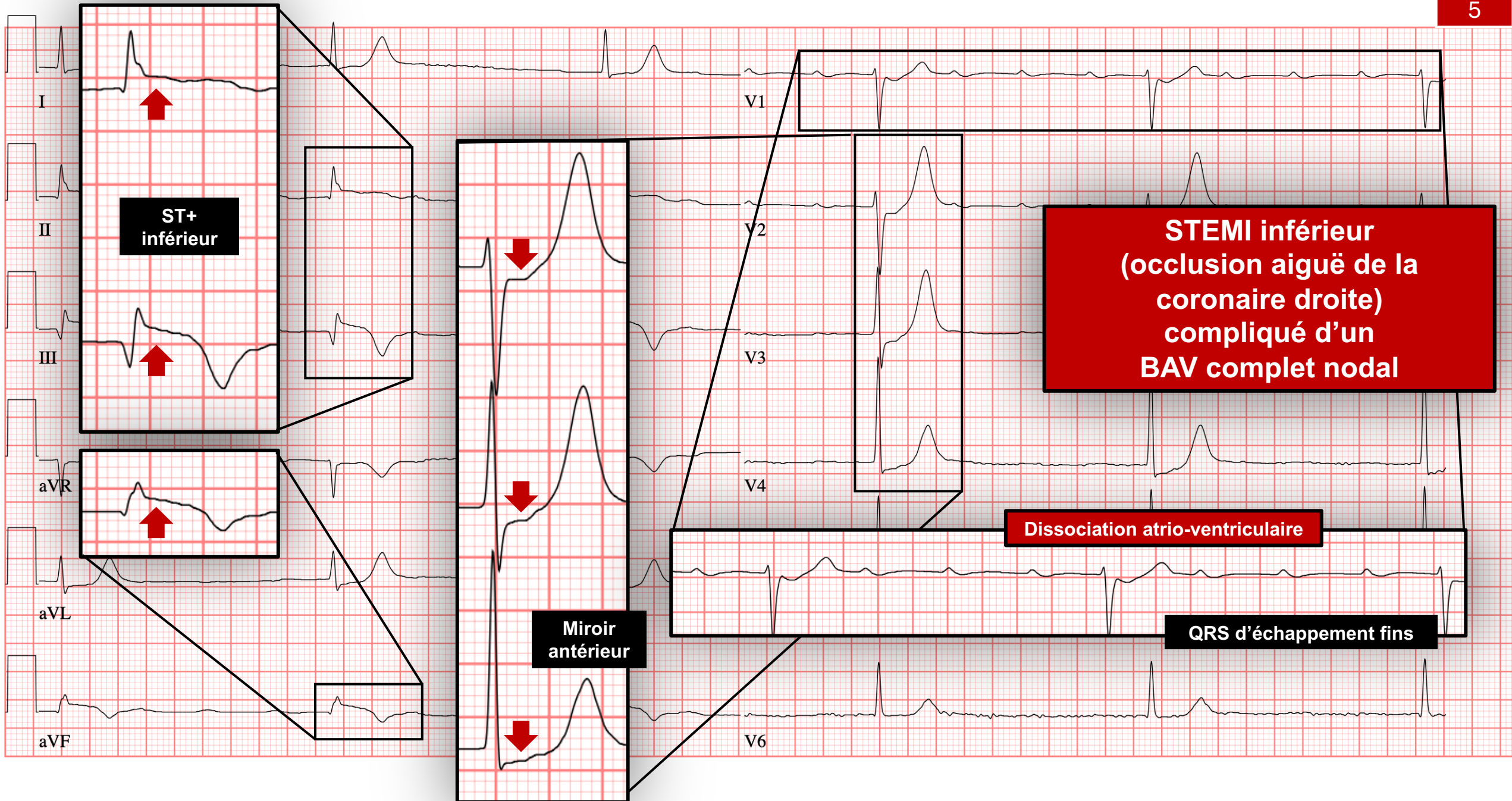
- ✓ ACCELERER LA FREQUENCE CARDIAQUE : ISOPRENALINE ou SONDE D'ENTRAÎNEMENT ELECTROSYSTOLIQUE (SEES)
- ✓ SULFATE DE MAGNESIUM IV
- ✓ KALIEMIE 4,5-5,5 mmol/l
- ✓ ARRETER TOUT TRAITEMENT TORSADOGENE / ALLONGEANT L'INTERVALLE QTc

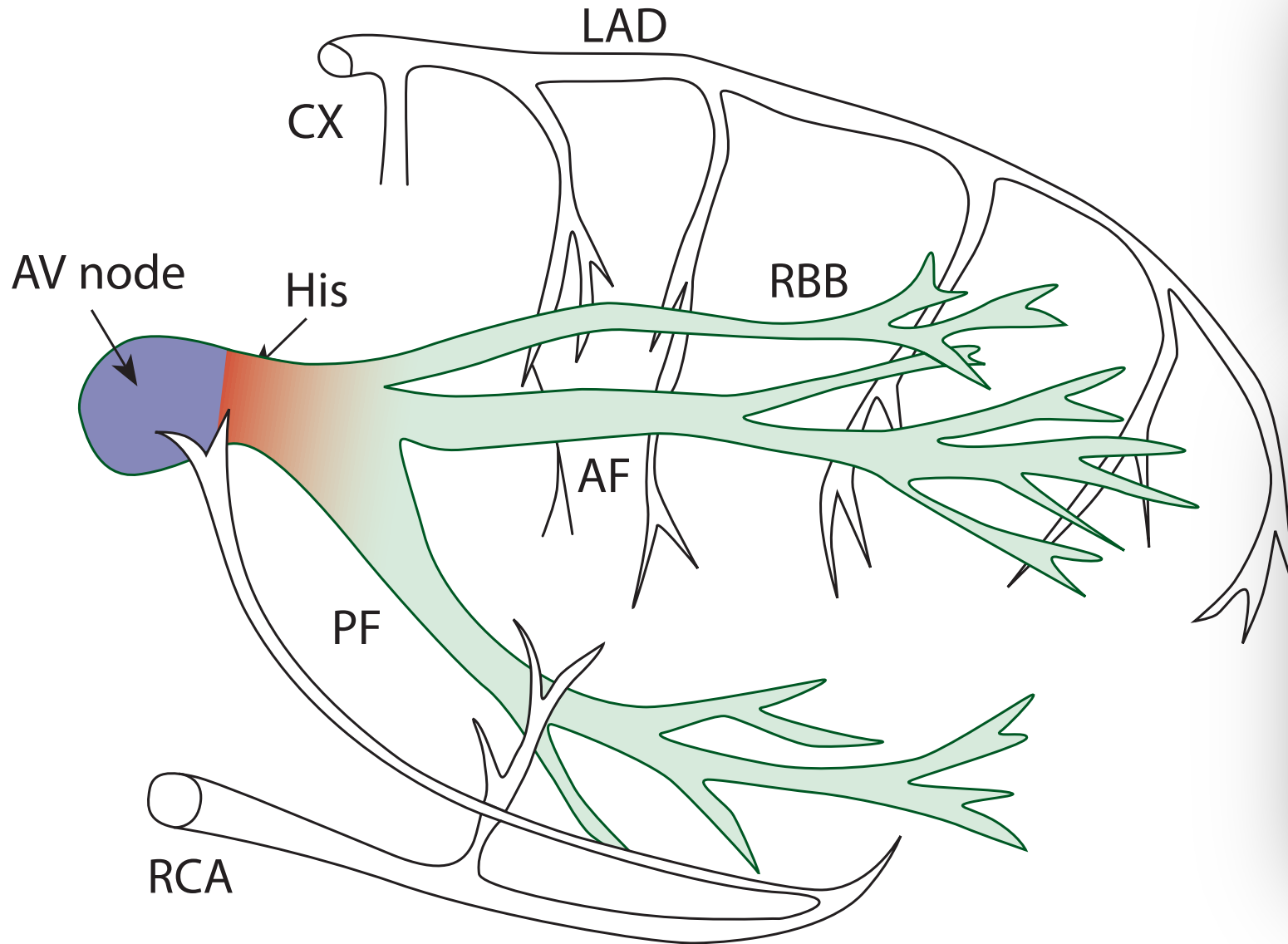












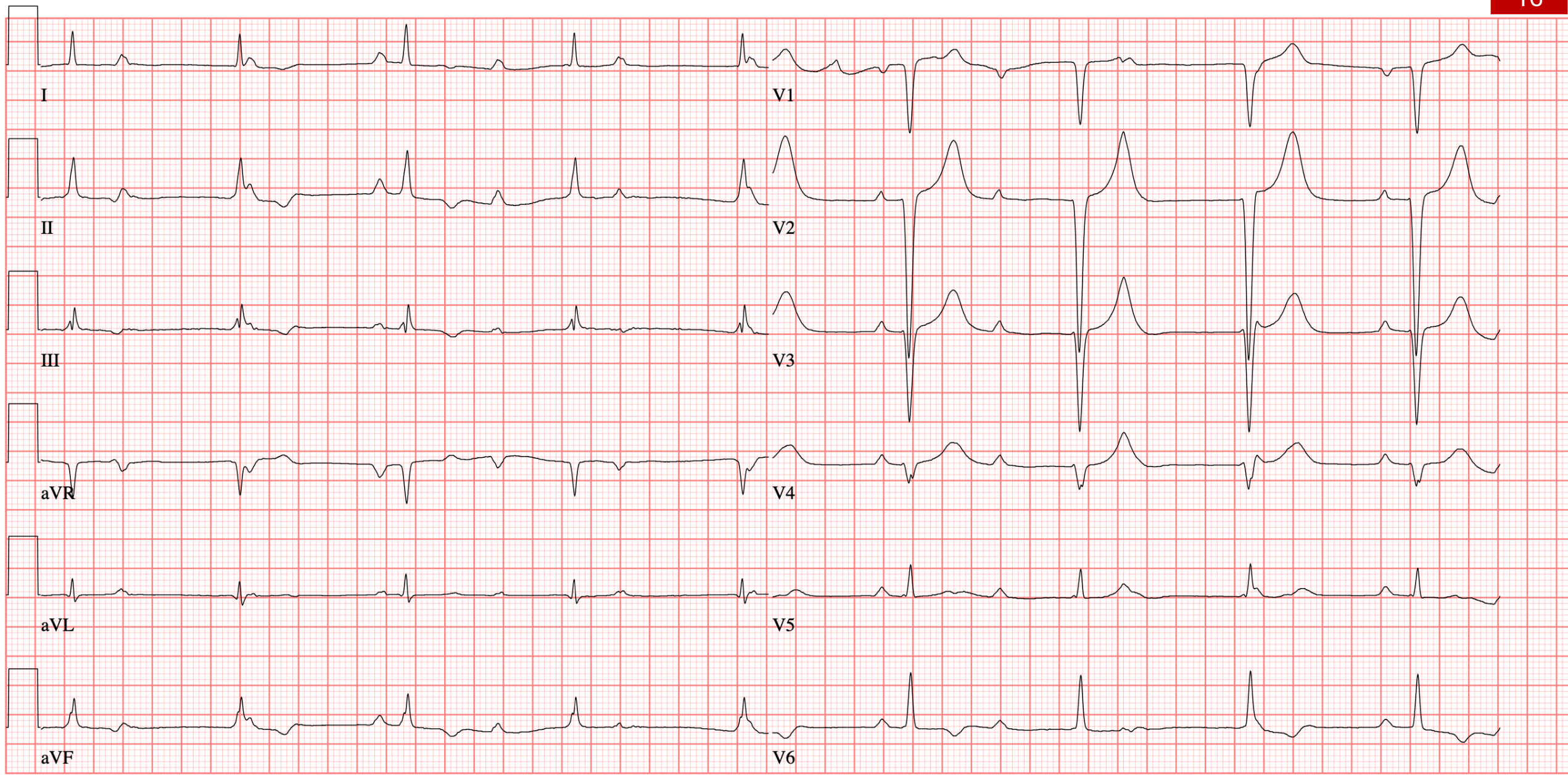
paramedicpractice.com

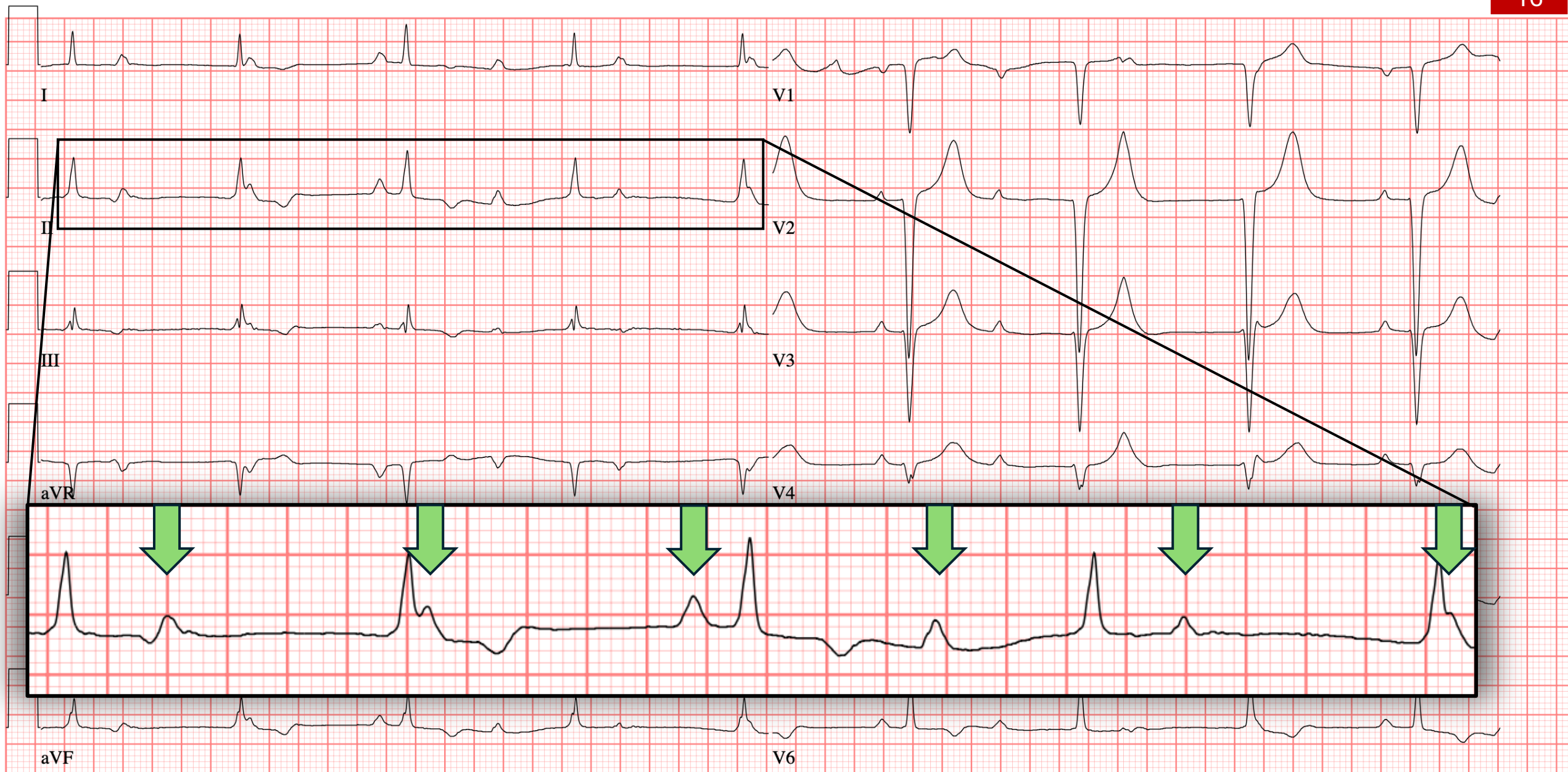
STEMI inférieur BAV complet nodal

Pas d'implication pronostique.
Régressif à la désocclusion de la
coronaire droite dans la majorité des
cas.

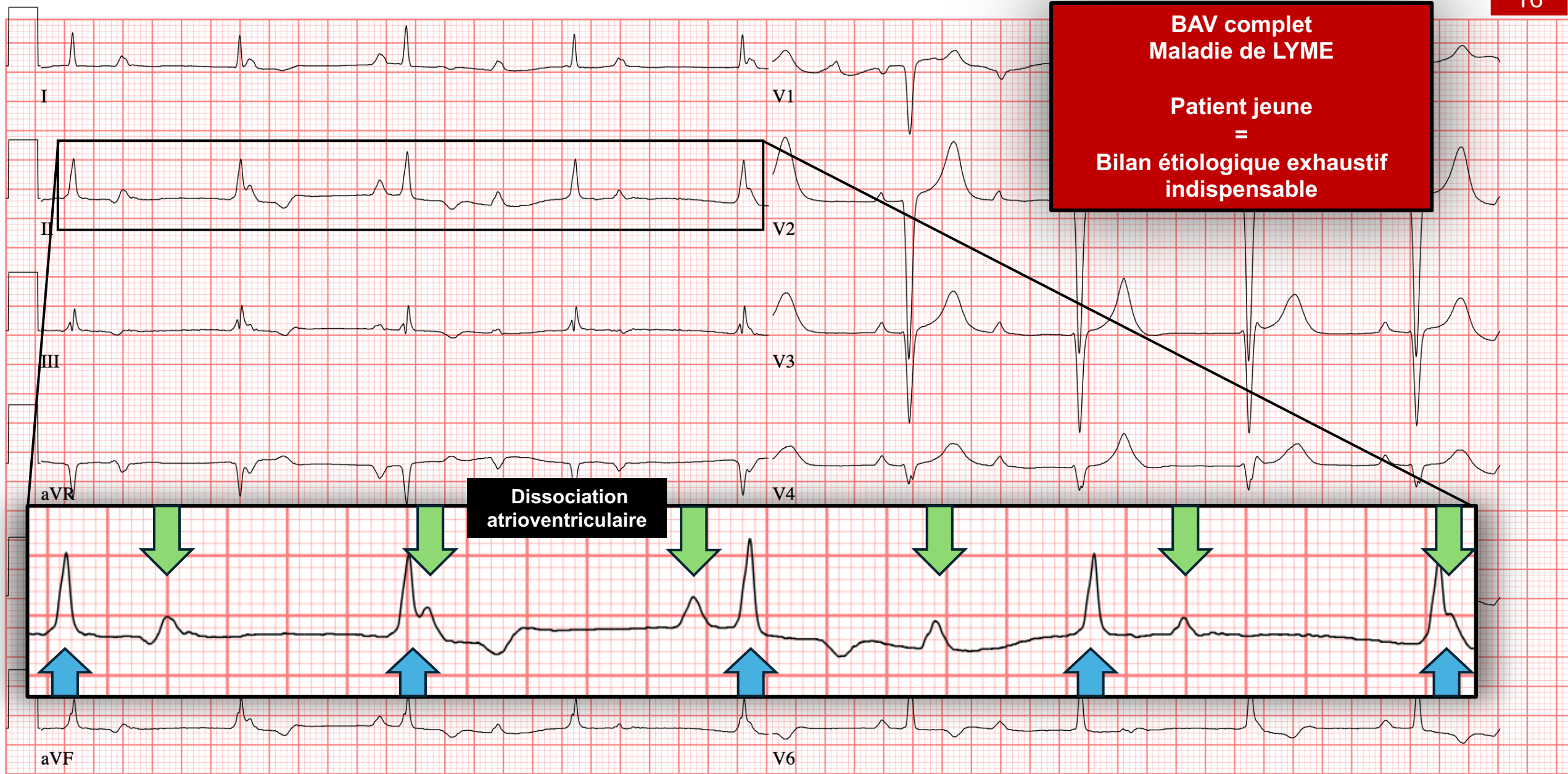
STEMI antérieur BAV complet hissien / infrahissien

Le BAVC est la traduction d'un
infarctus étendu, profond avec part
de nécrose irréversible. Le BAVC
récupère rarement à la
revascularisation. Pronostic souvent
sévère (séquelle antérieure étendue).





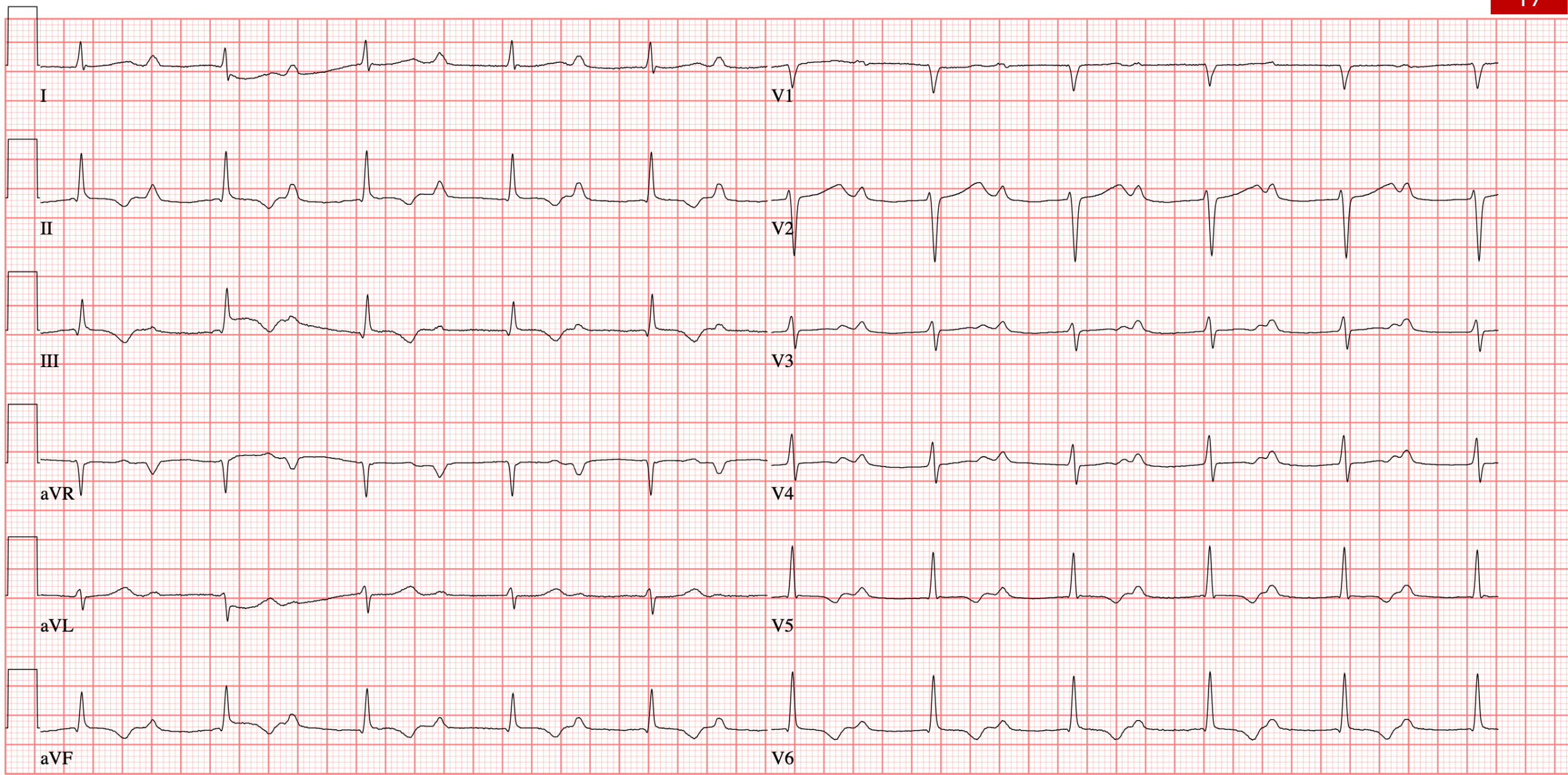


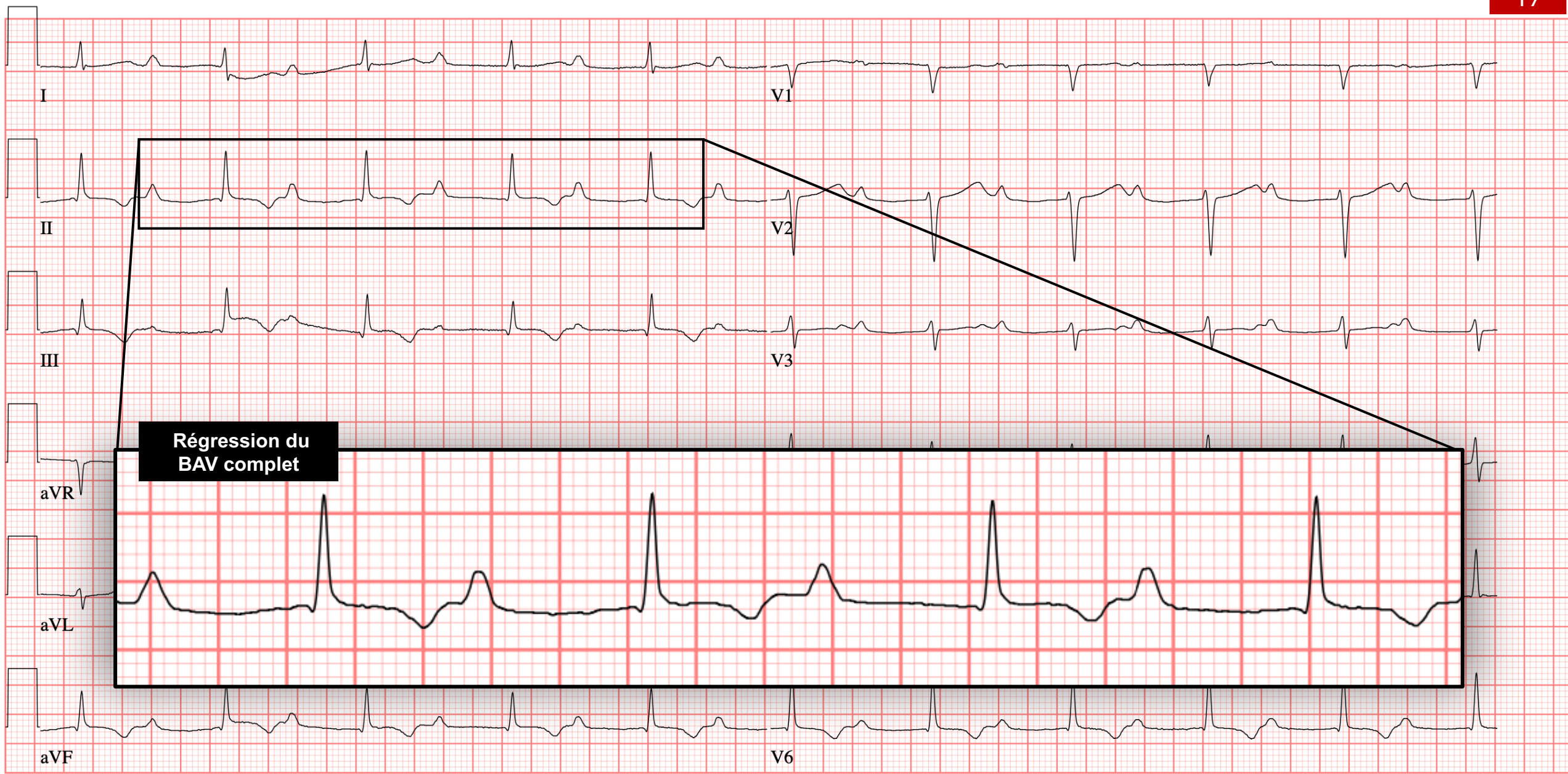


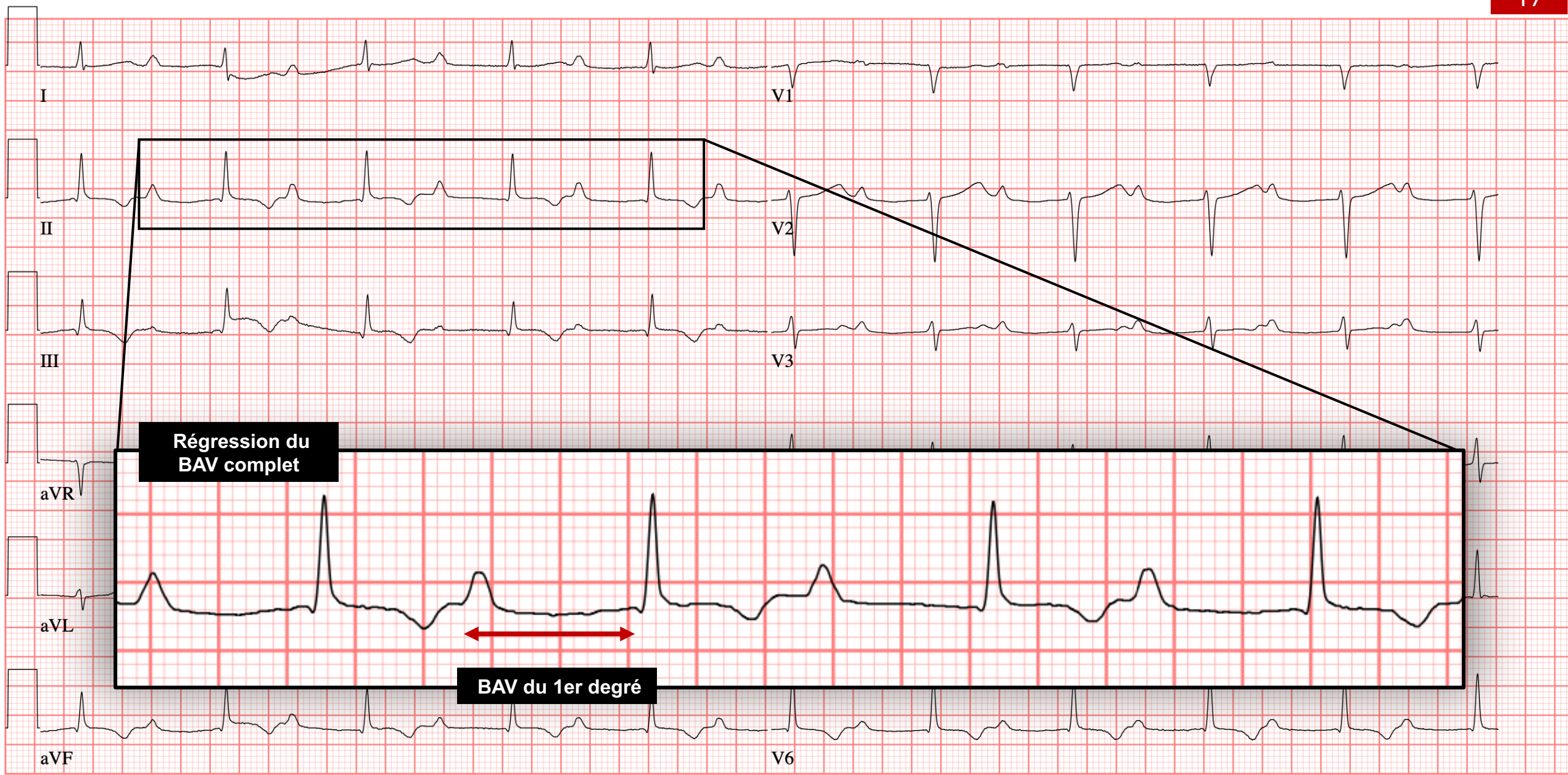
BAV complet
Maladie de LYME

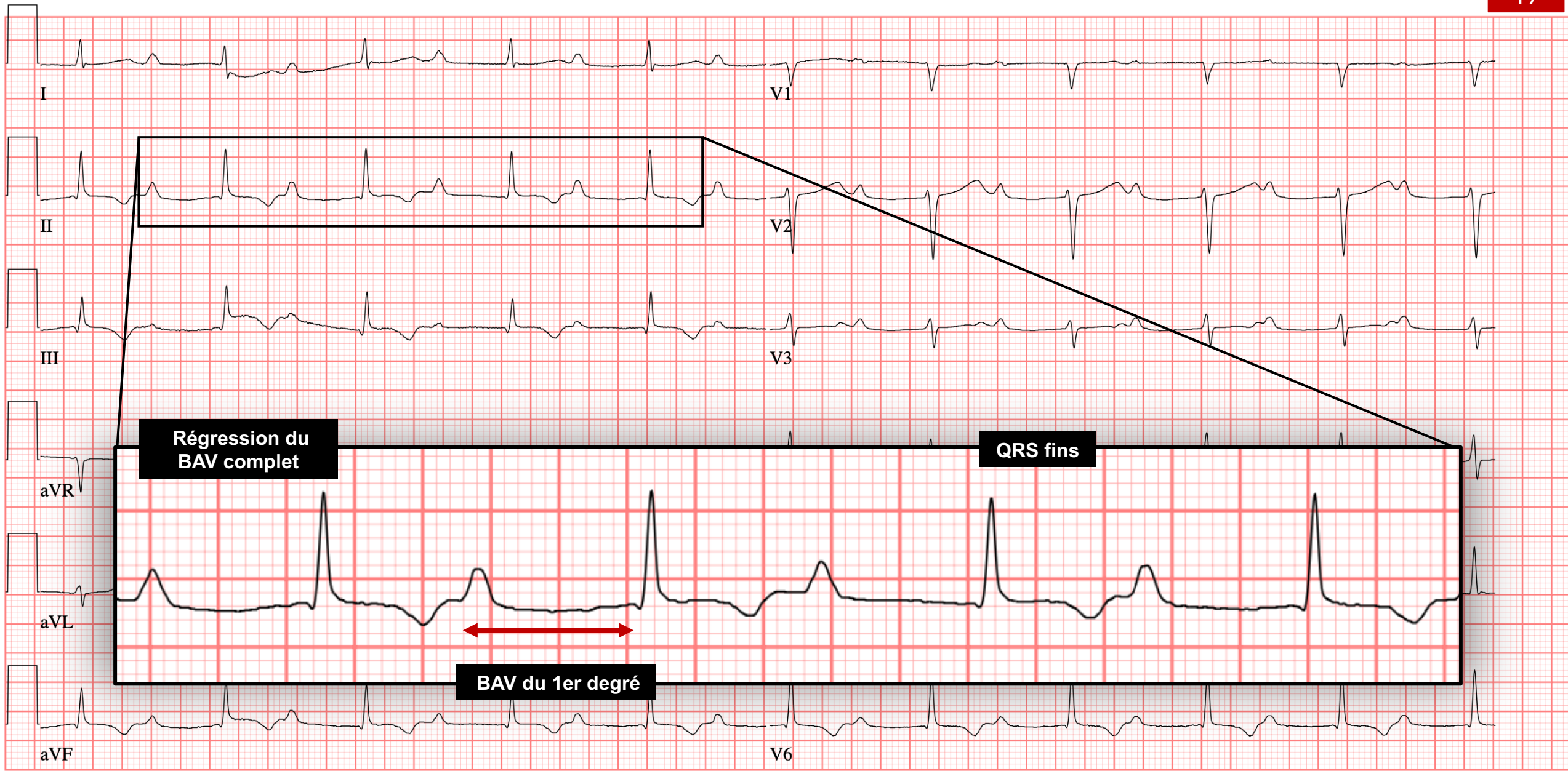
Patient jeune
=
Bilan étiologique exhaustif
indispensable

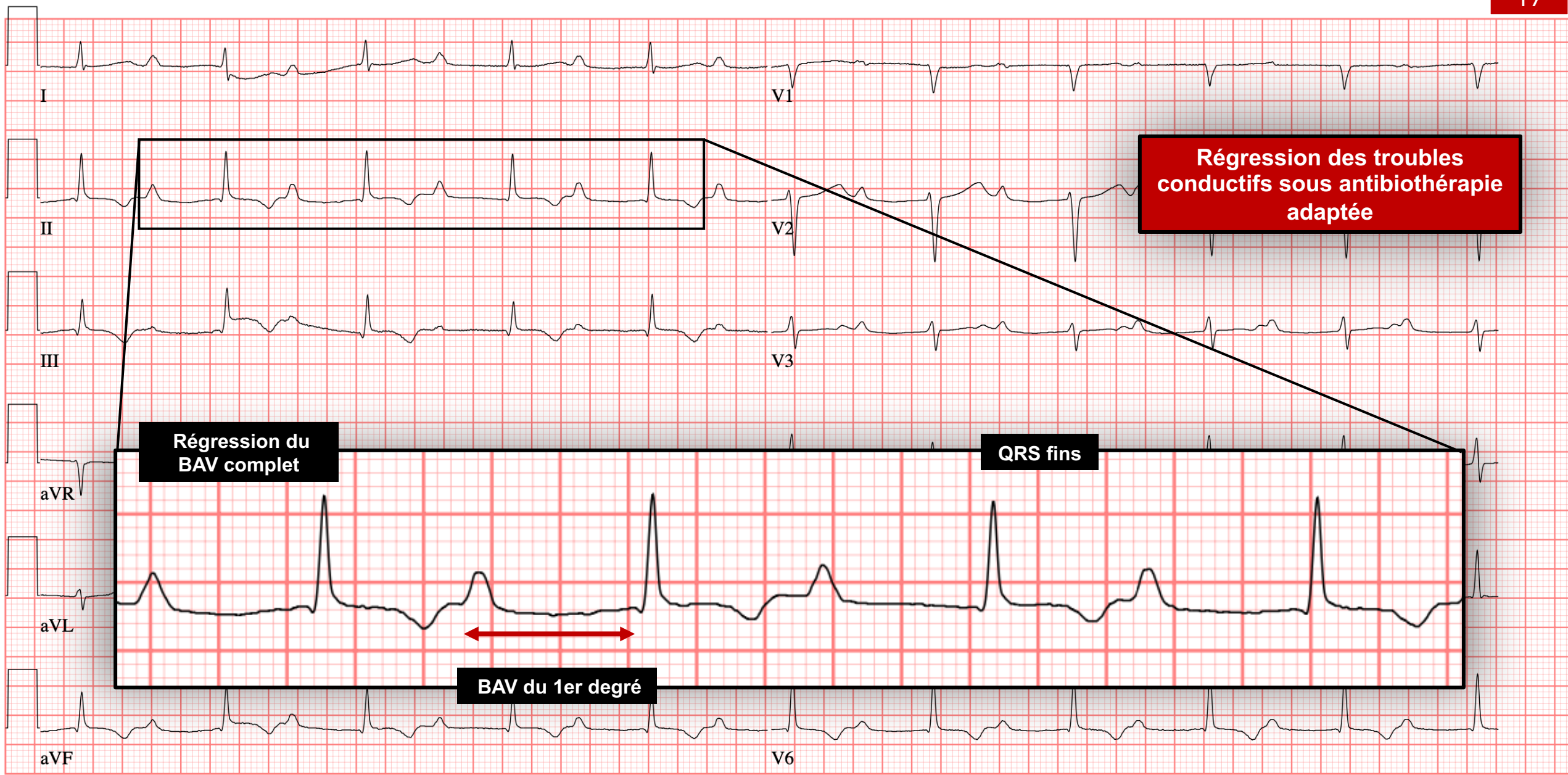
Dissociation
atrioventriculaire

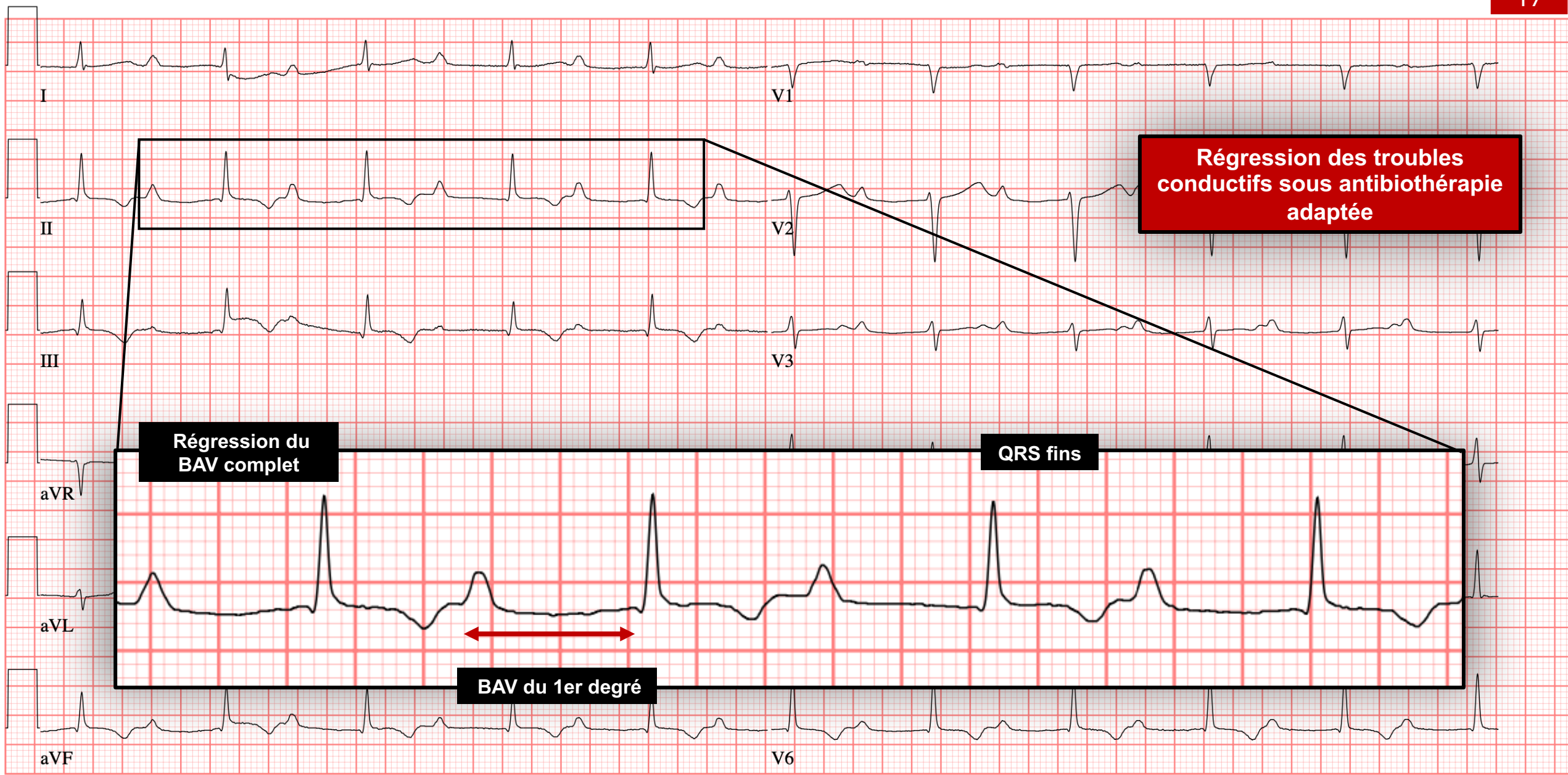










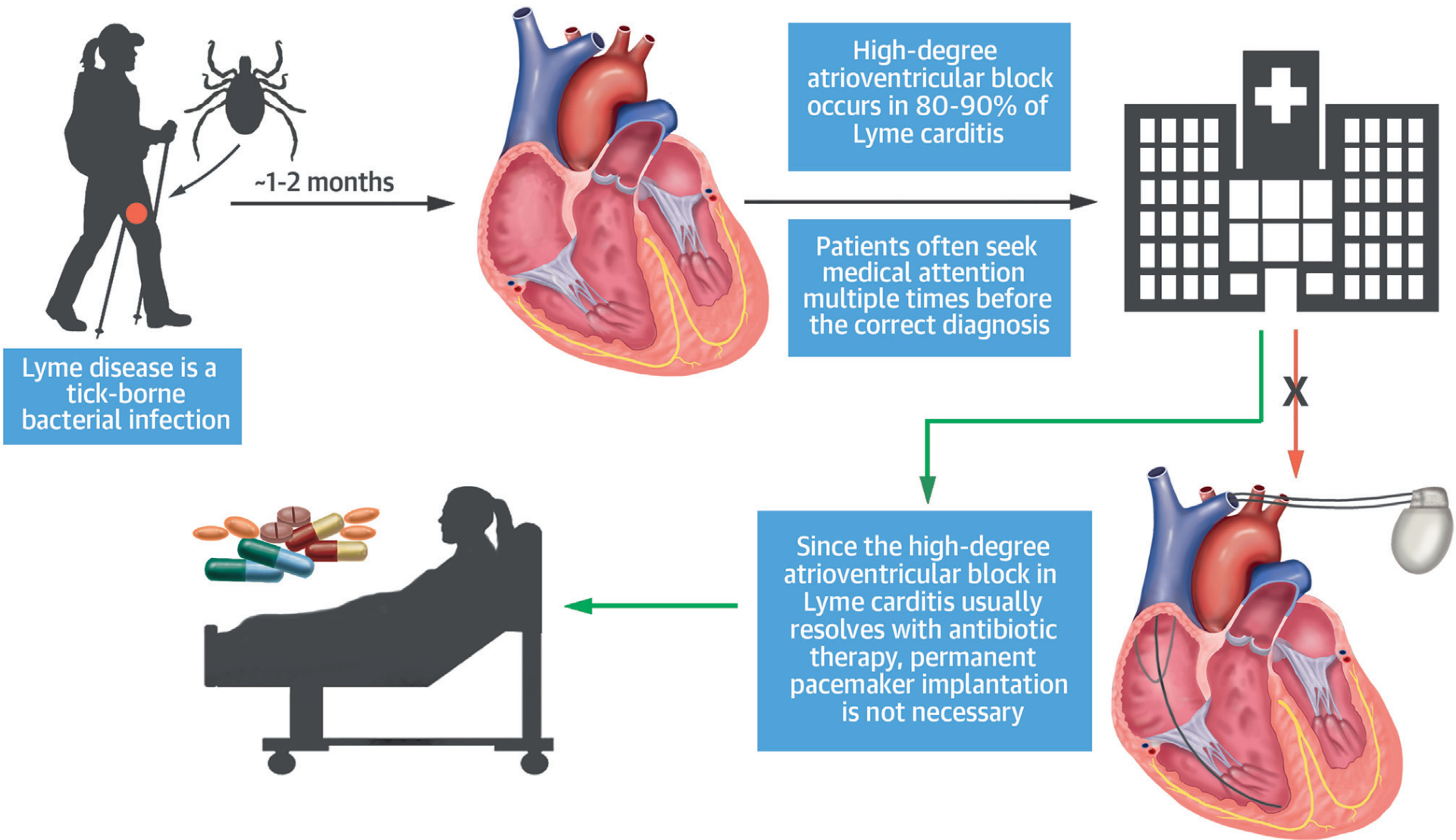


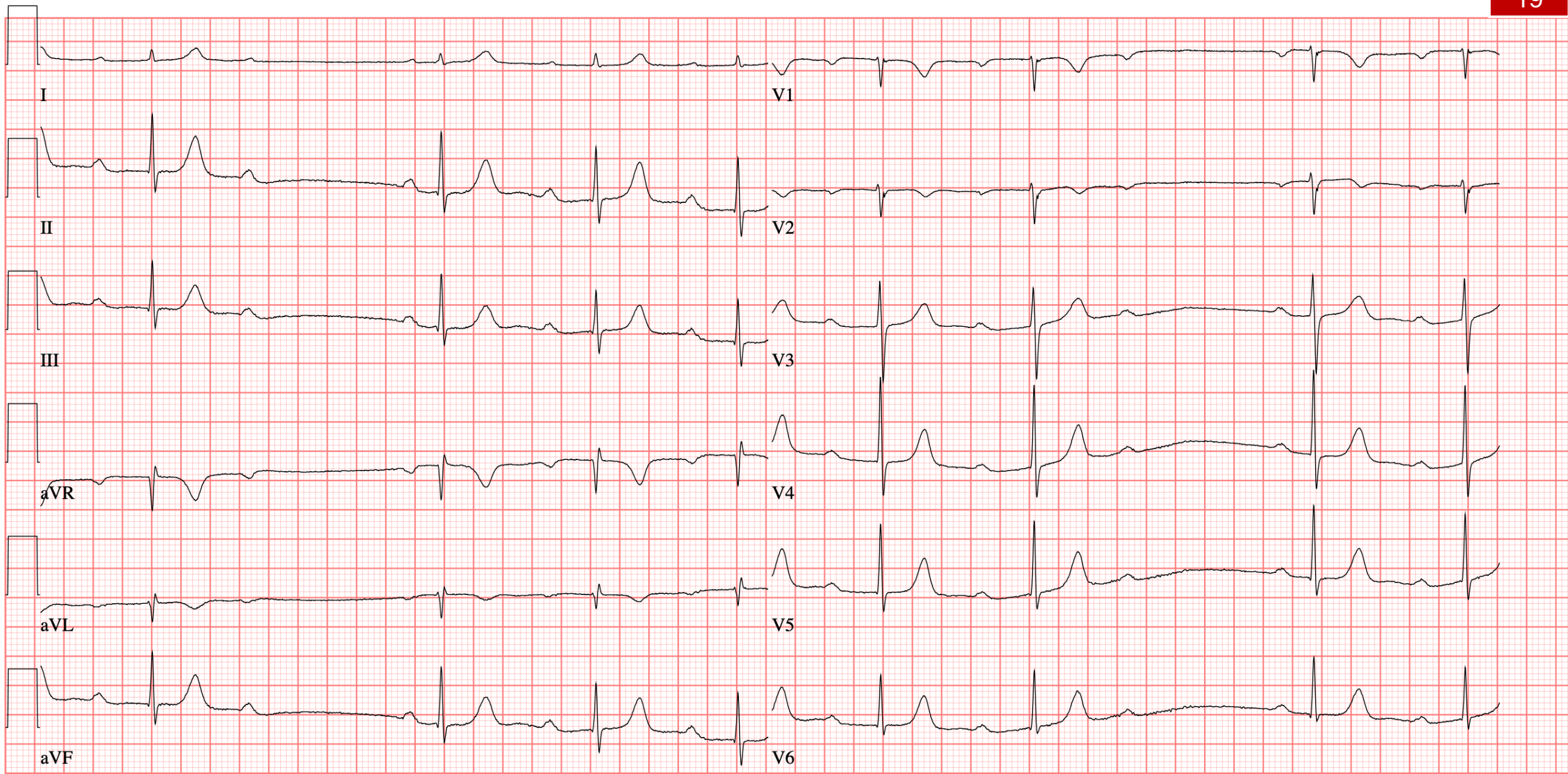
Régession des troubles conductifs sous antibiothérapie adaptée

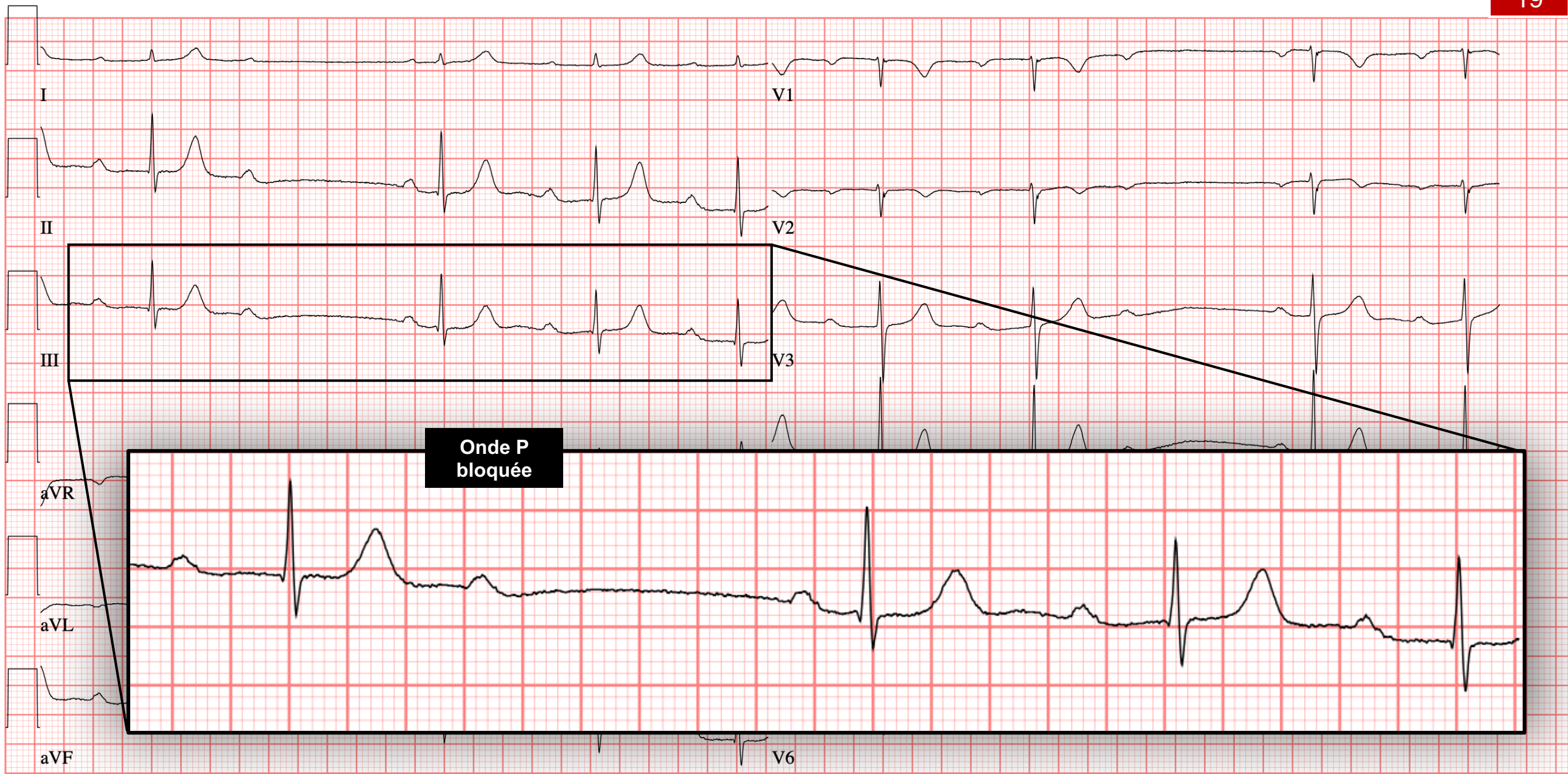
Régession du BAV complet

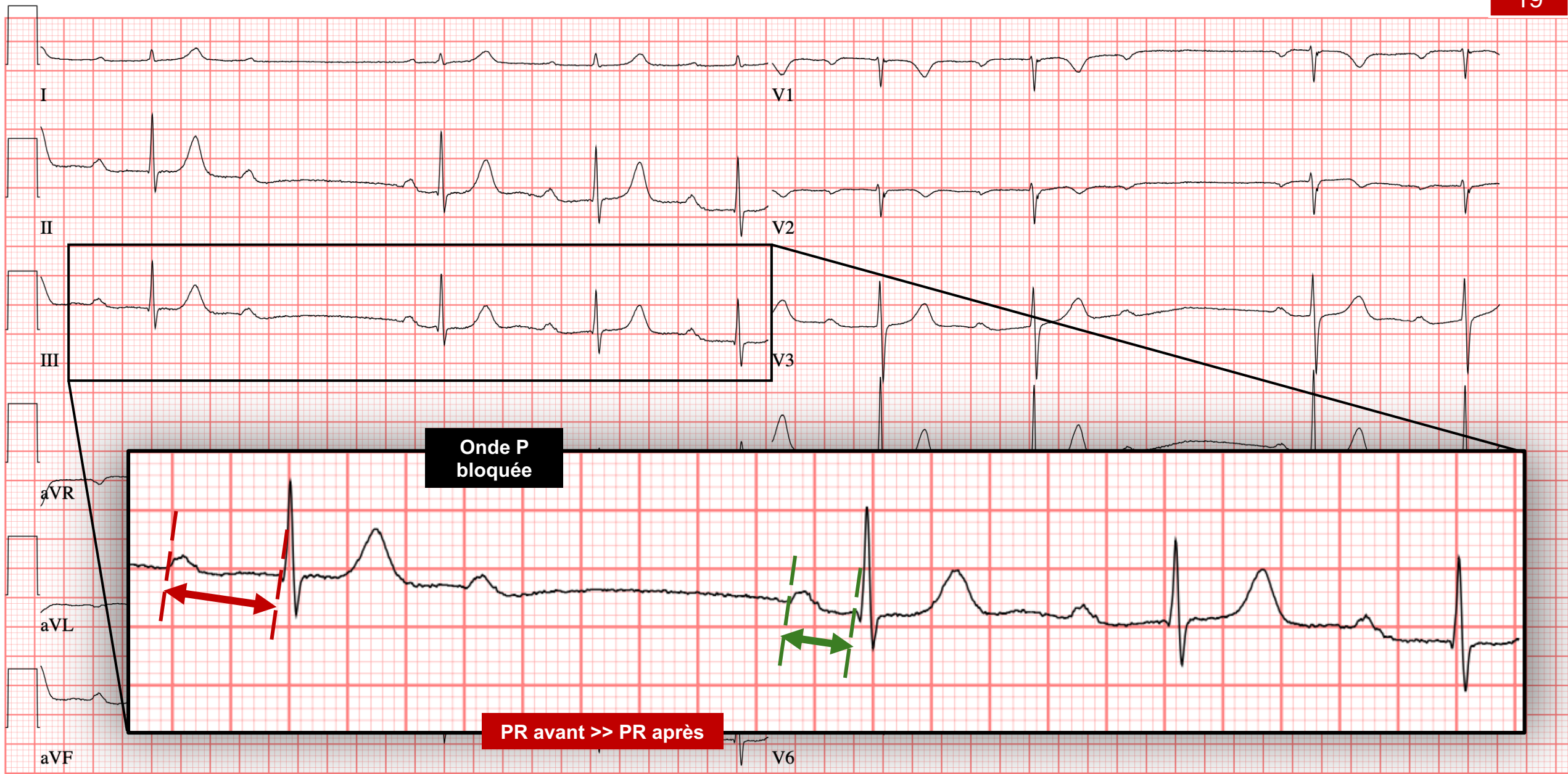
QRS fins

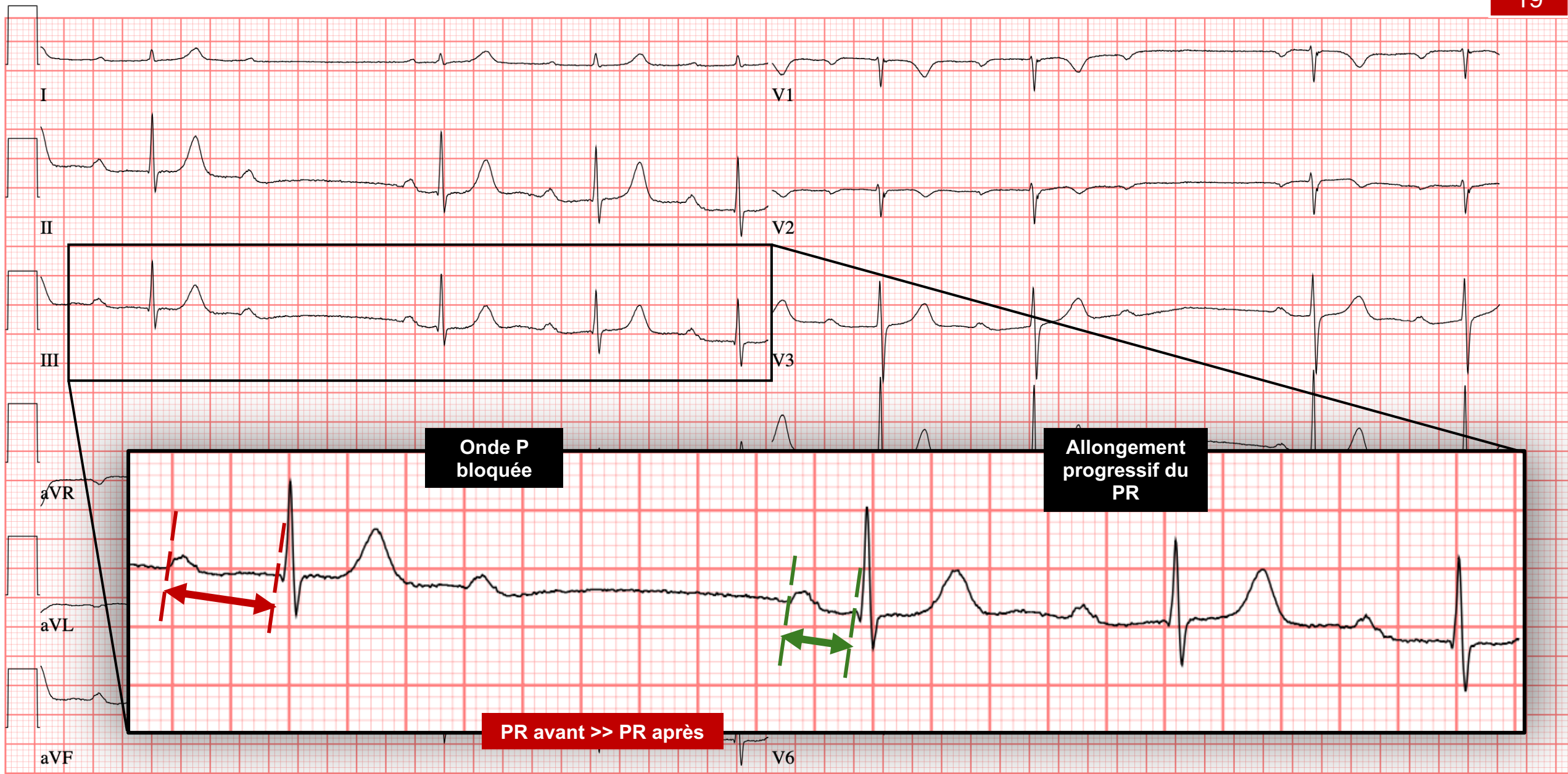
BAV du 1er degré











Bloc atrioventriculaire

P-R constant ≥ 200 ms



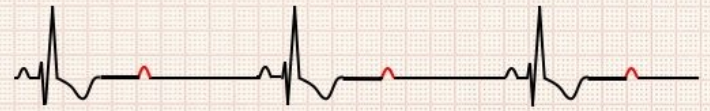
BAV I

P-R croissant
jusqu'à P bloquée



BAV II Mobitz 1
(Wenckebach)

P-R constant
ratio P/QRS = 2



BAV 2/1
(intranodal QRS fins,
infranodal QRS larges*)

P-R constant
P bloquée parfois



BAV II Mobitz 2
(infranodal*)

PP réguliers
 ≥ 2 P bloquées



BAV haut degré
(infranodal*)

Dissociation entre P
et complexes QRS

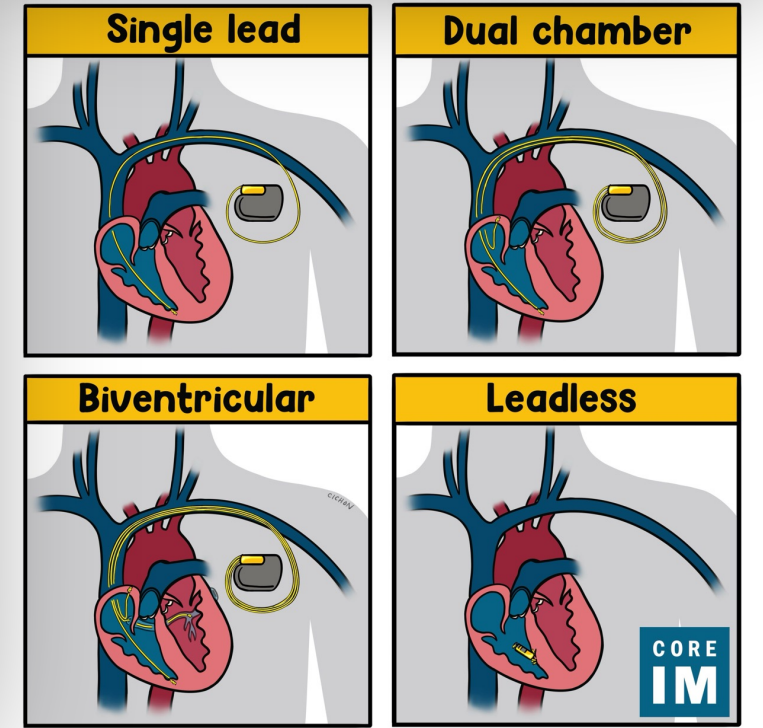


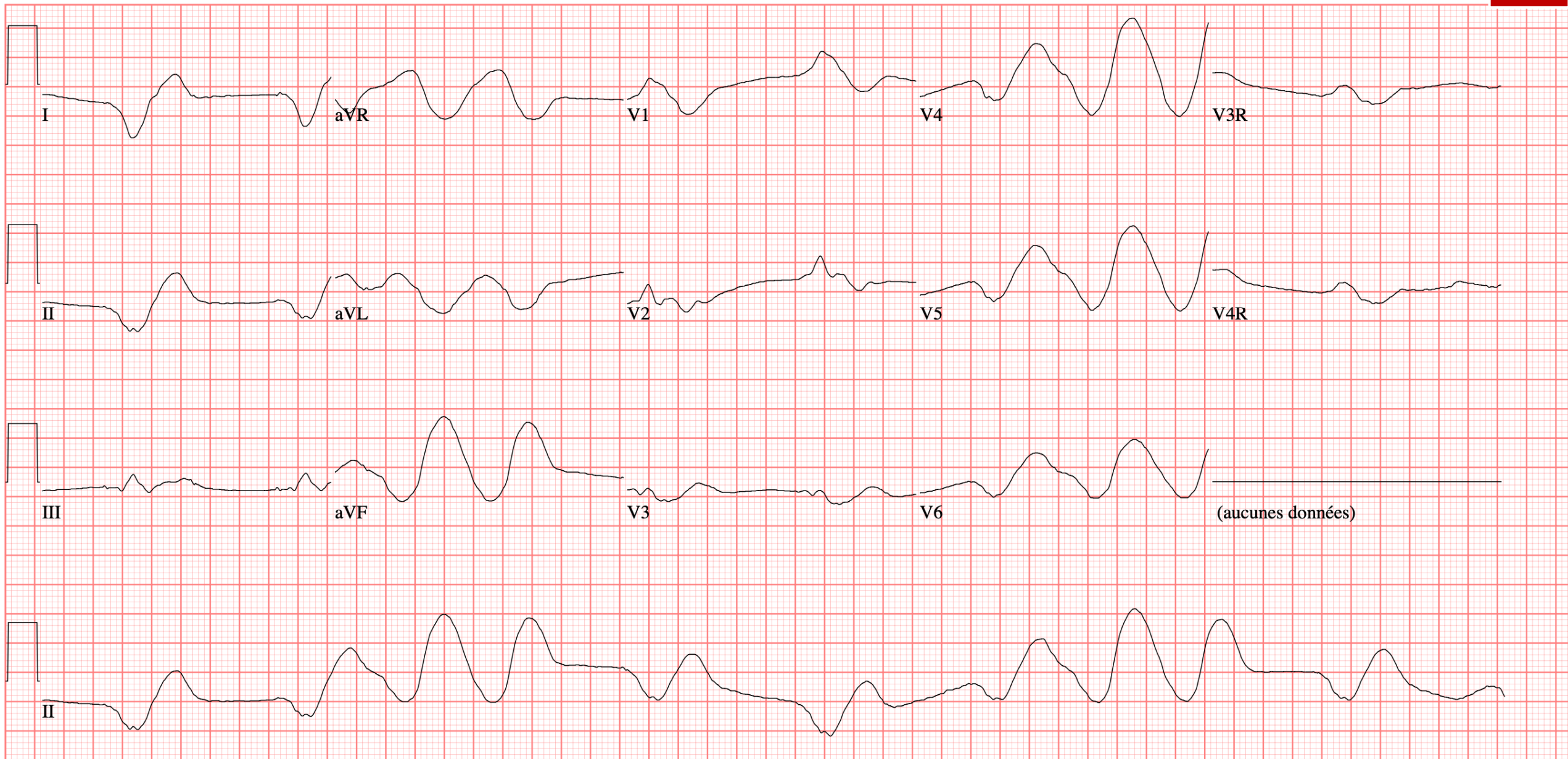
BAV III
(infranodal*)

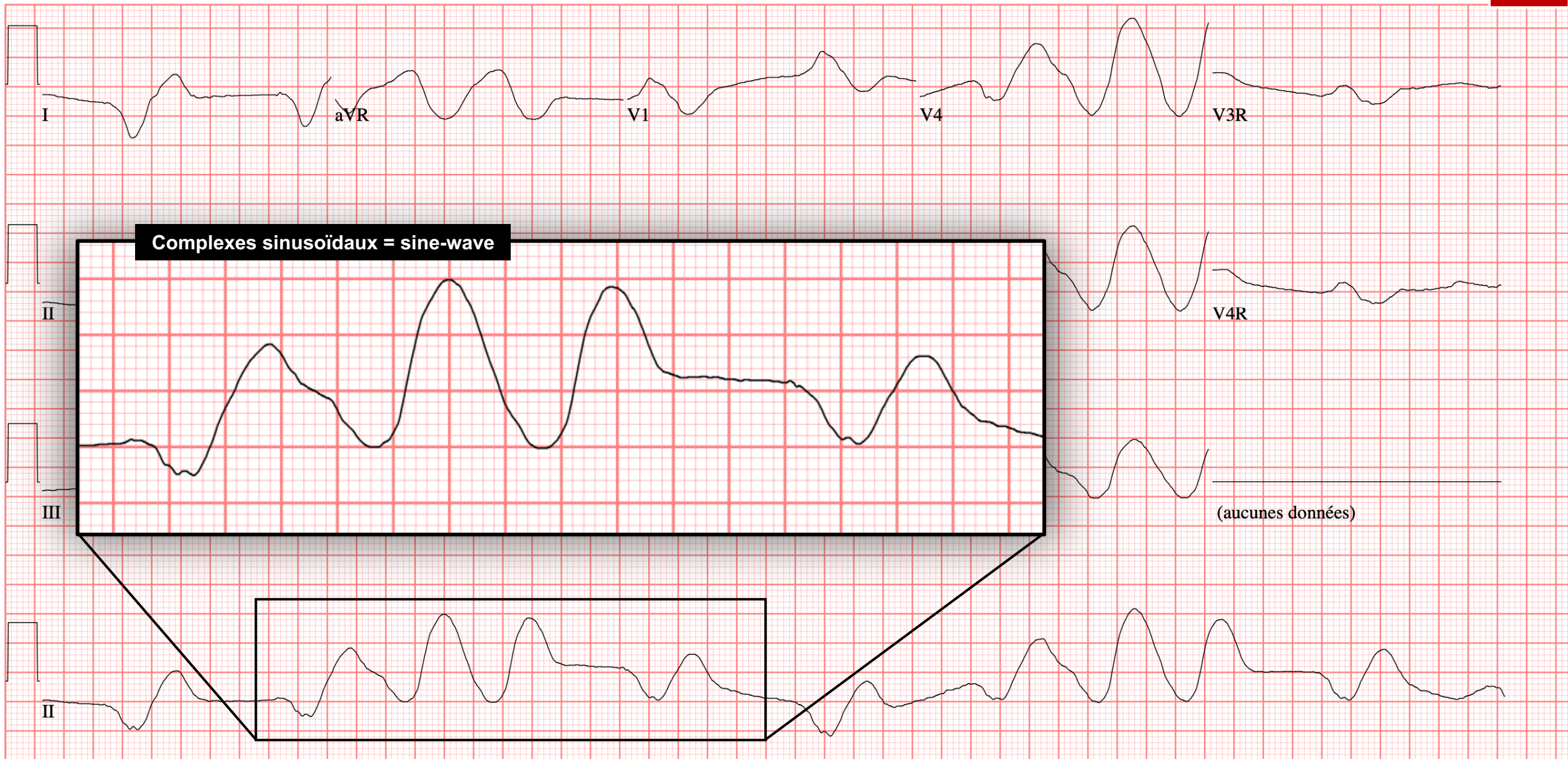
e-cardiogram.com

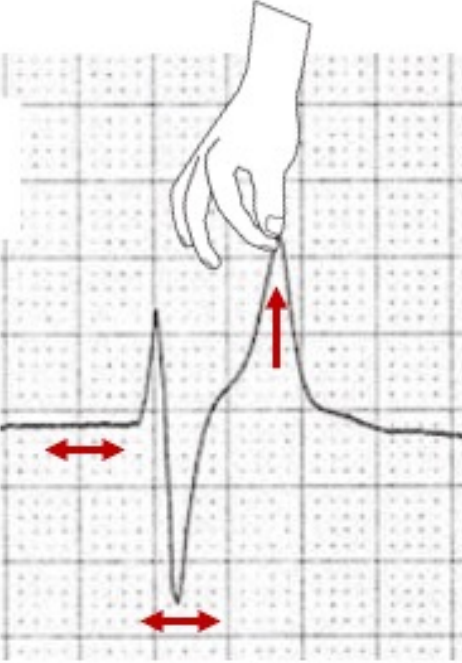
BAV nodal = BAV2M1
Stimulateur cardiaque uniquement si
symptômes (non pronostique).

BAV hisien / infrahisien
Stimulateur cardiaque systématique
si absence de cause réversible
(pronostique).










Hyperkalaemia

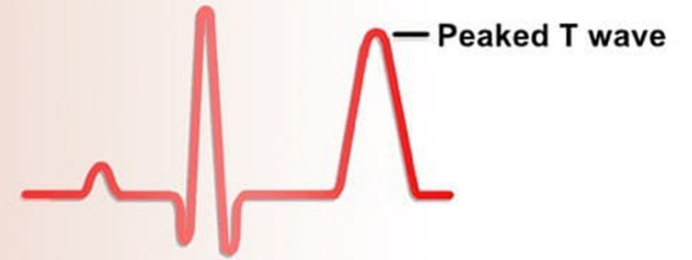
Peaked T waves
P wave flattening
PR prolongation
Wide QRS complex



litfl.com

Hyperkalemia

Serum potassium
(6-7 mmol/l)



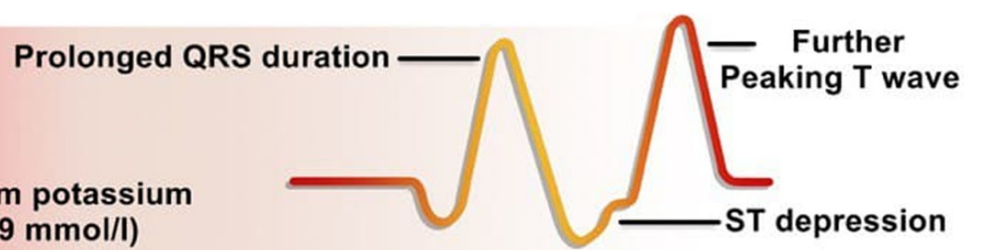
Hyperkalemia

Serum potassium
(7-8 mmol/l)



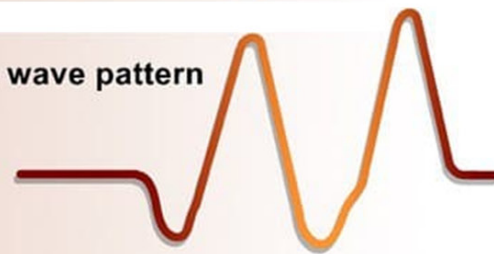
Hyperkalemia

Serum potassium
(8-9 mmol/l)

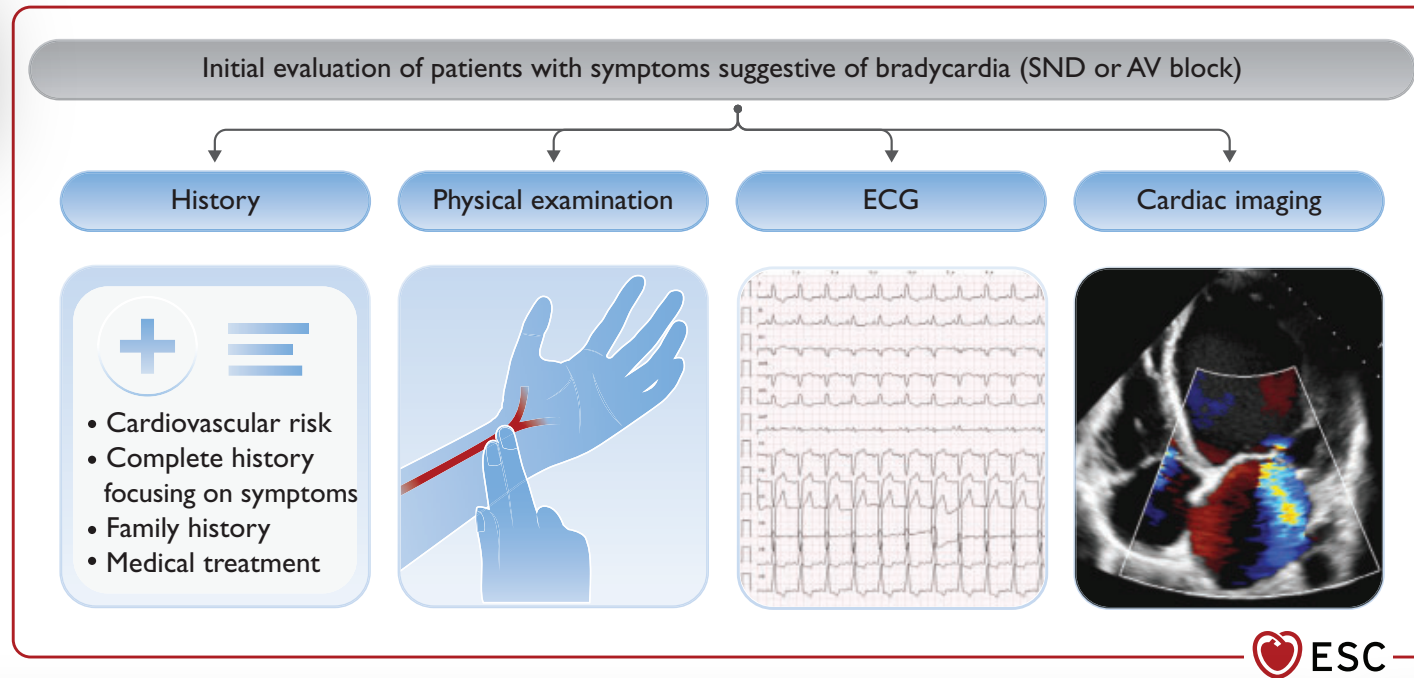


Hyperkalemia

Serum potassium
(>9 mmol/l)



BILAN INITIAL



Glikson M et al.
European Heart Journal (2021) 00, 194

BILAN ETIOLOGIQUE

Rechercher une **cause aiguë potentiellement réversible** :

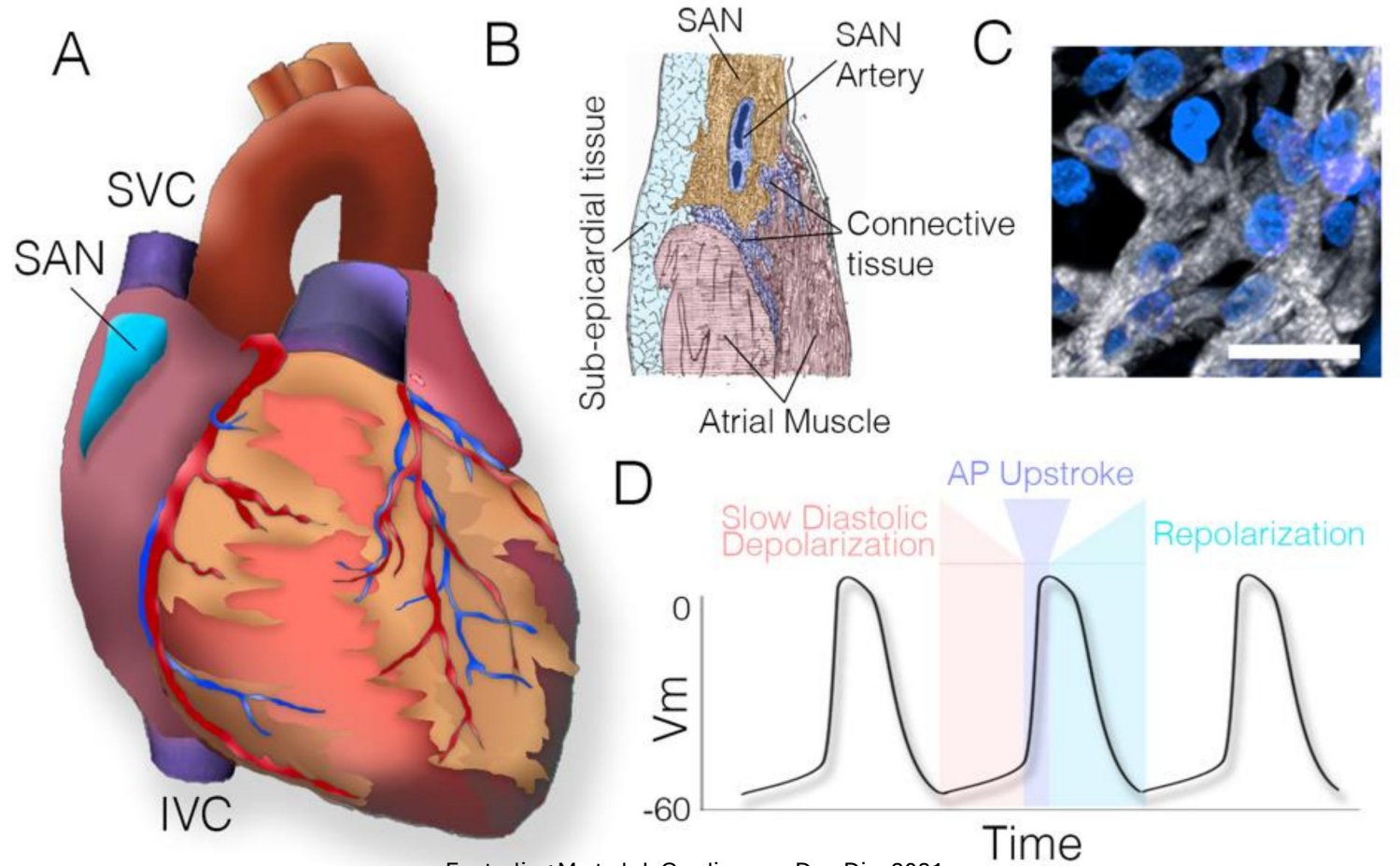
- Traitements
- Ischemie
- Hyper/hypokaliémie
- Hypercalcémie
- Endocardite infectieuse
- Myocardite / cardiopathie inflammatoire

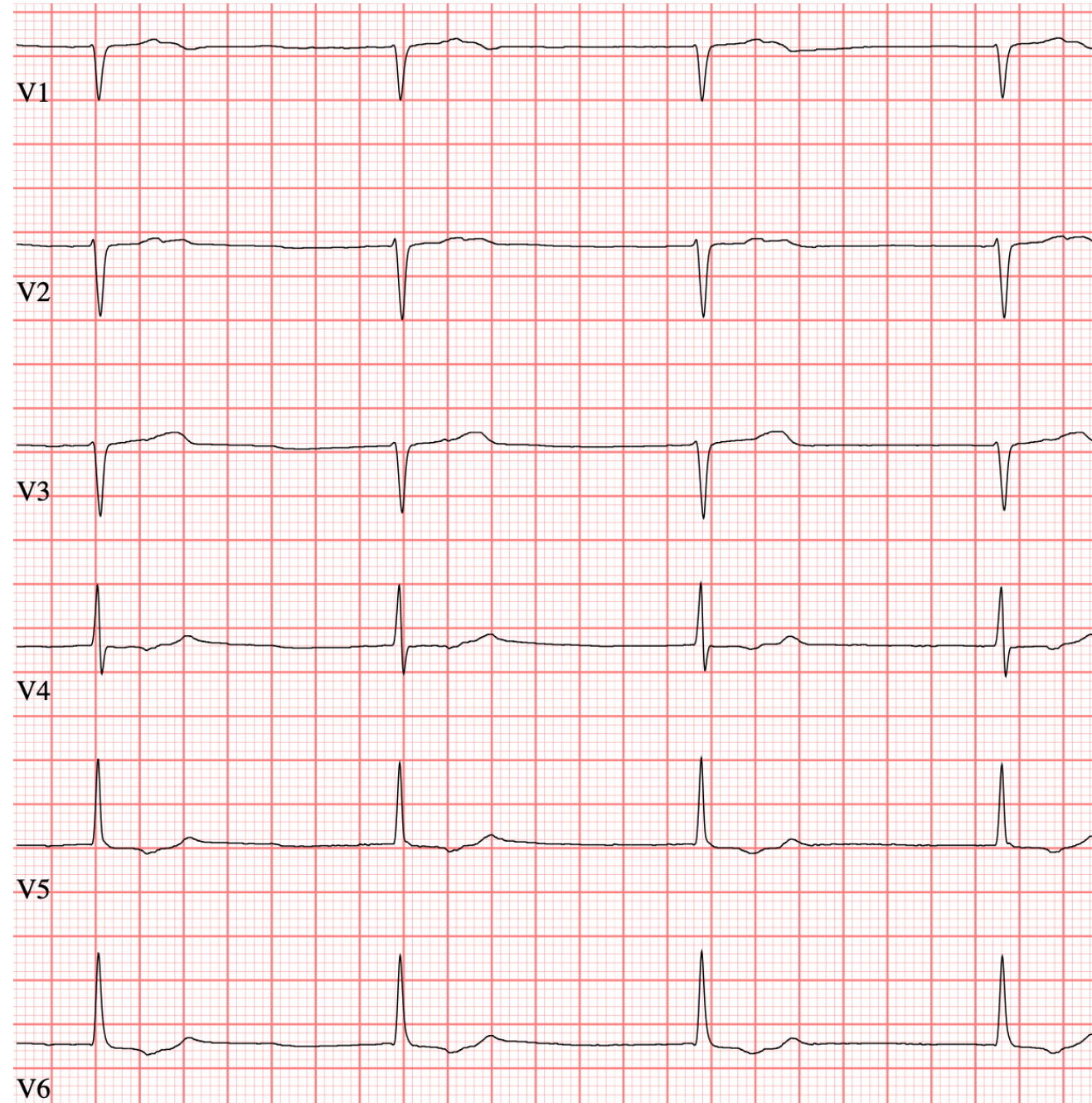
Bilan minimal

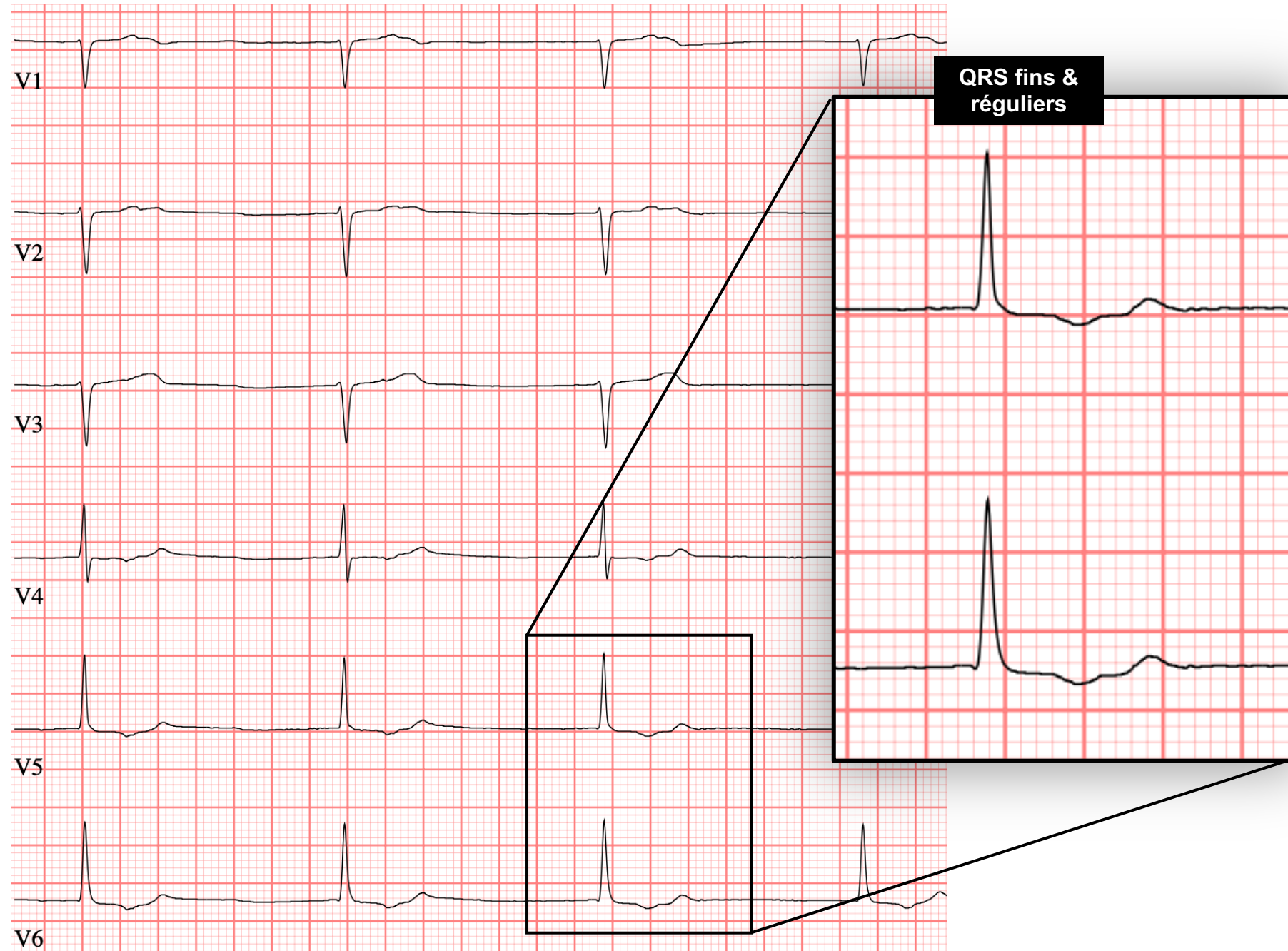
- **Biologie :**
 - Kaliémie
 - Calcémie
 - Troponinémie
 - CRP
- **Echocardiographie**

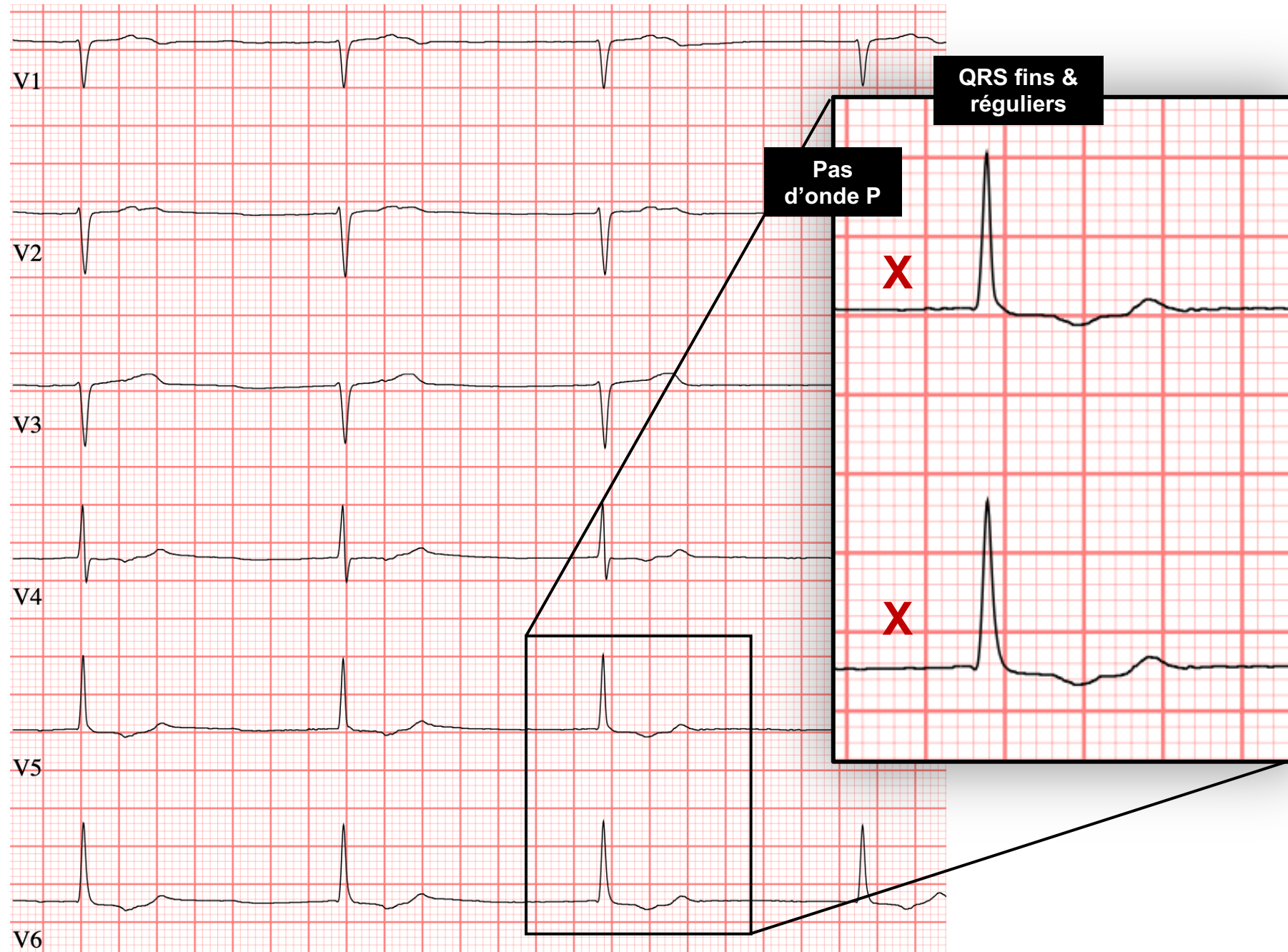
- **Autres bilans guidés par contexte**
- **< 50/60 ans :**
 - IRM cardiaque
 - Discuter Génétique

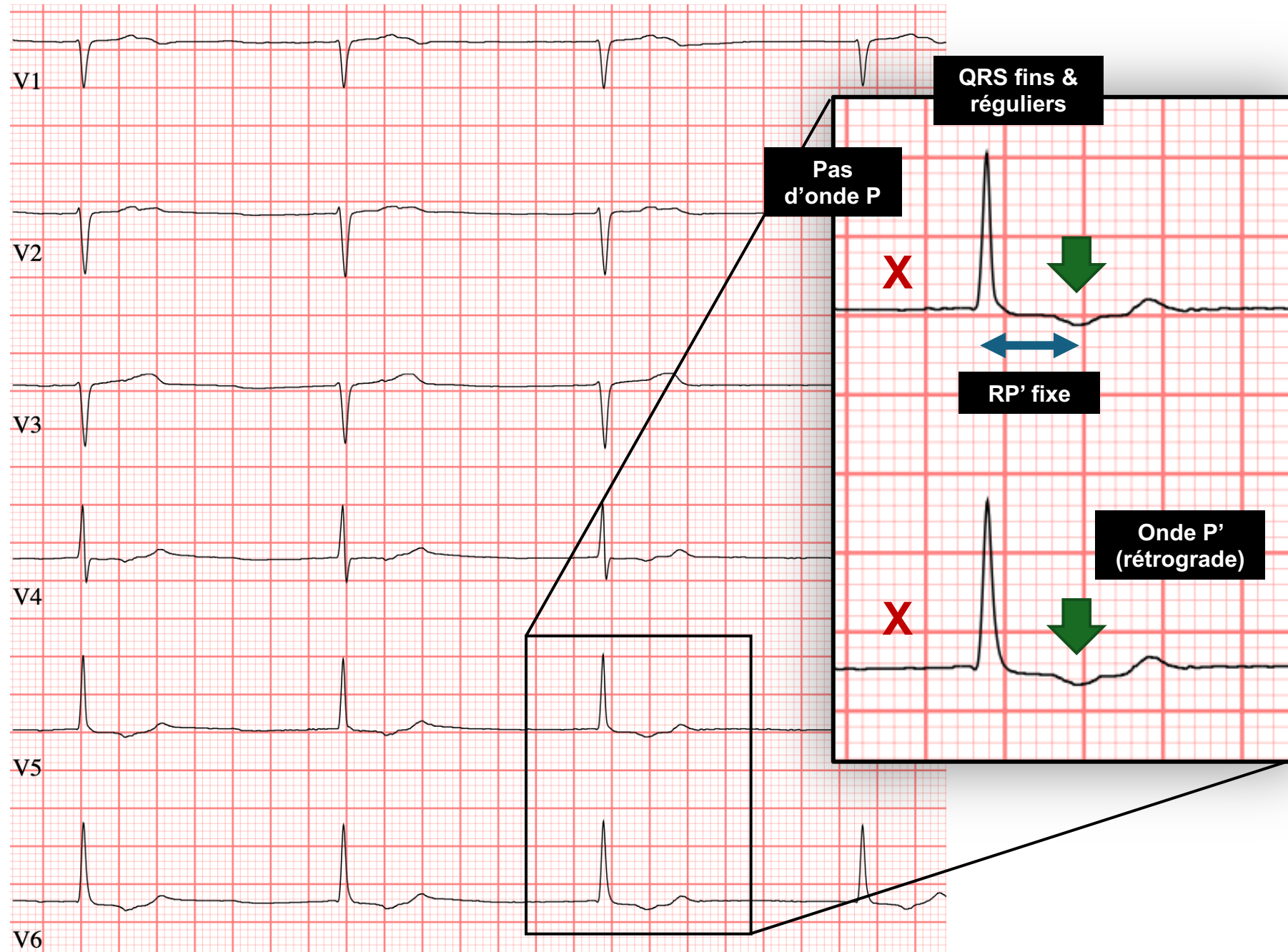
Troubles conductifs sino-atriaux



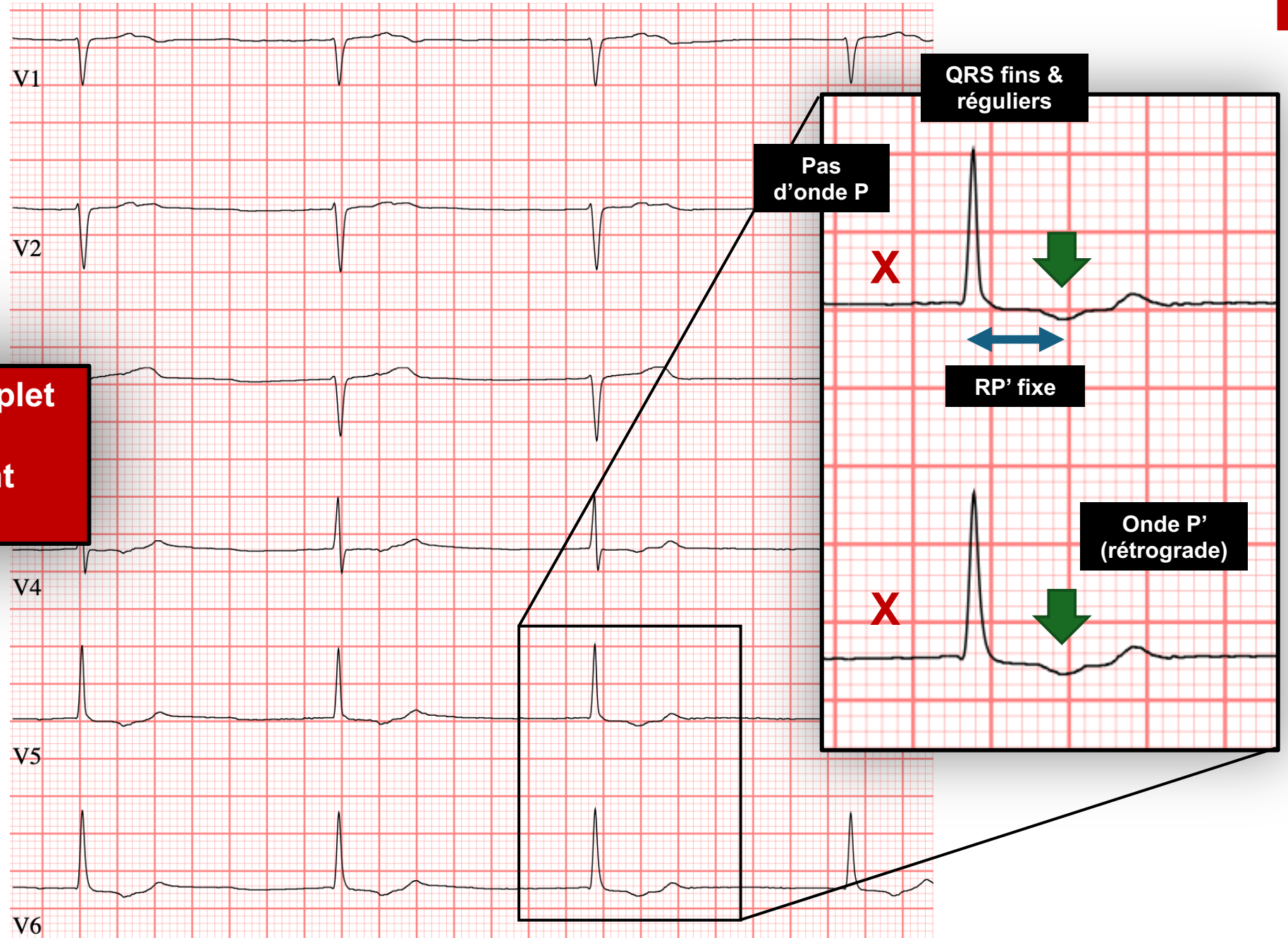




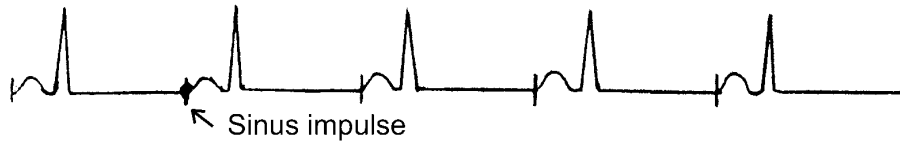




**Bloc sino-atrial complet
(BSA3)
avec échappement
jonctionnel**

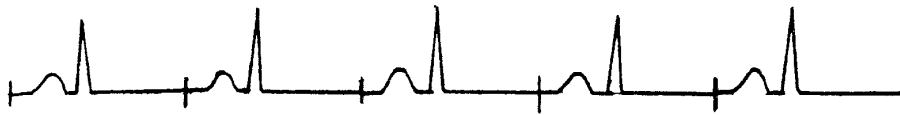


Normal

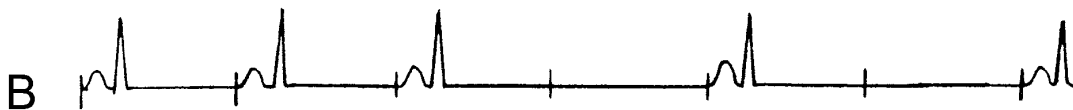
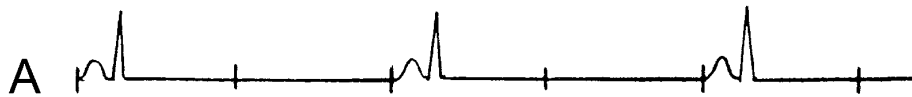


Suawicz B, Knilans TK.
Chou's
electrocardiography in
clinical practice. 5th
edition. Philadelphia: WB
Saunders; 2001.

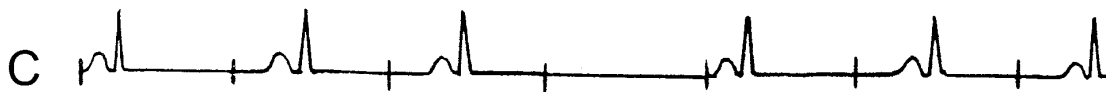
1° SA Block



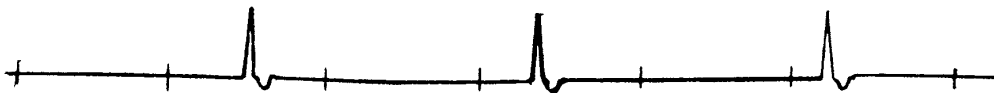
2° SA Block



Wenckebach



3° SA Block

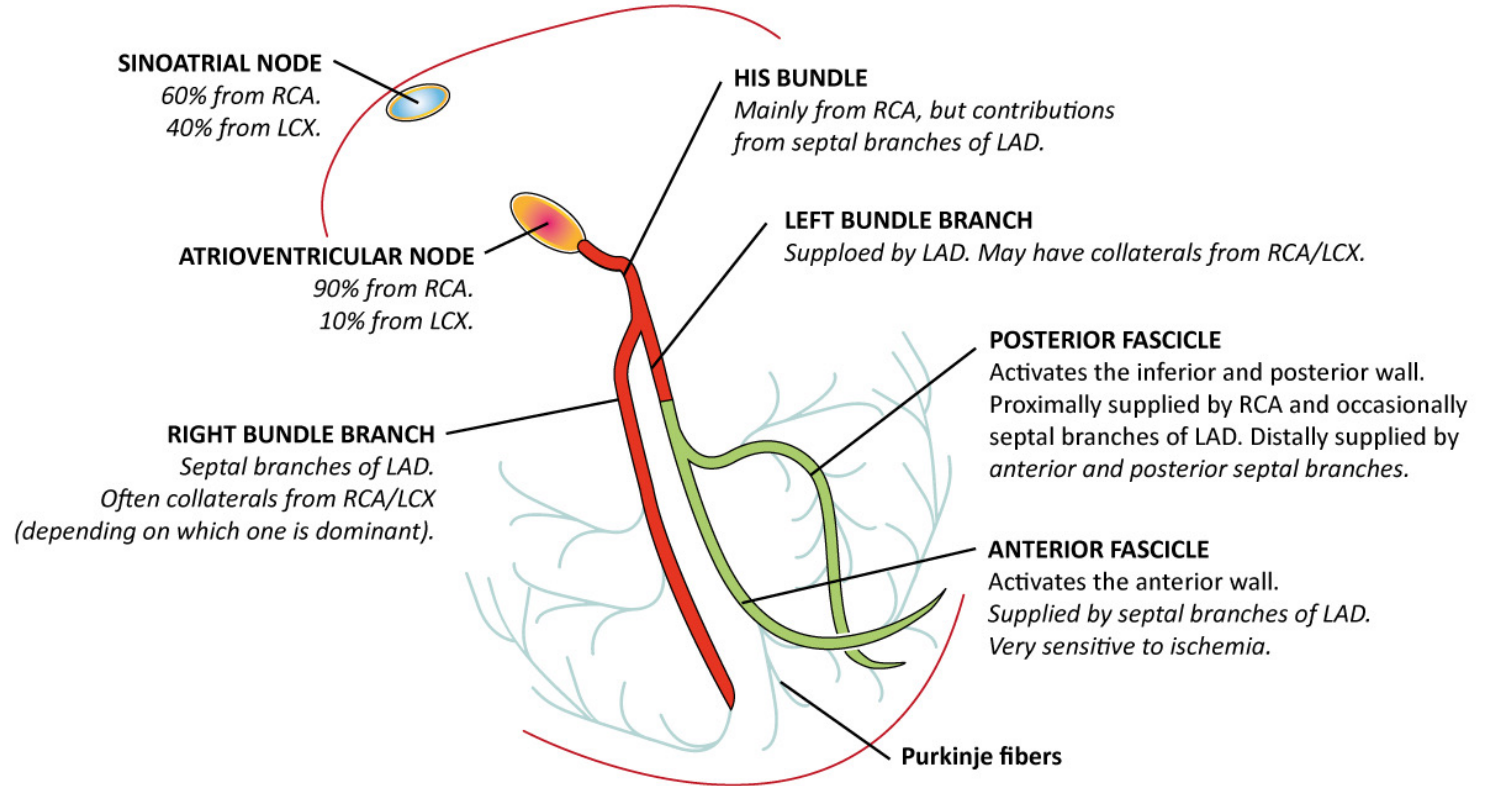


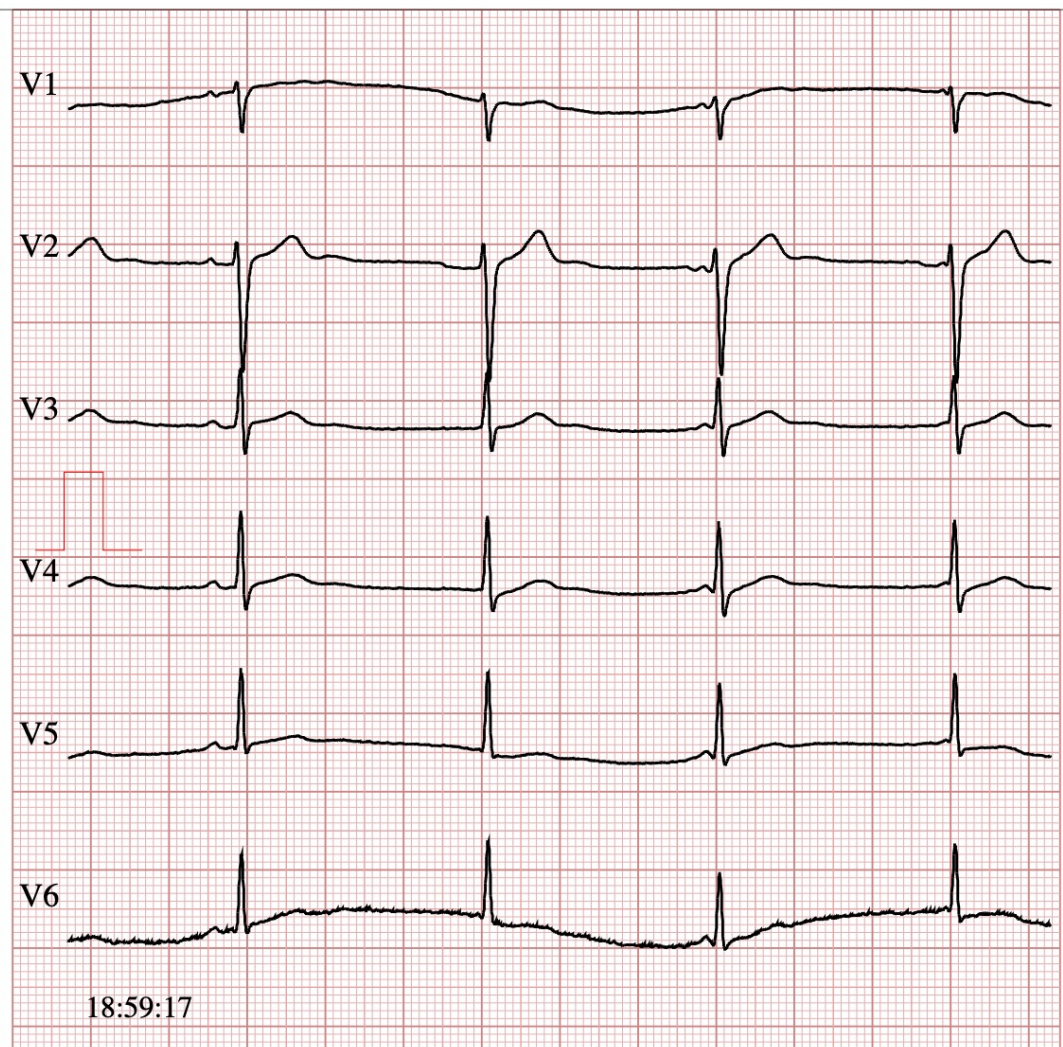
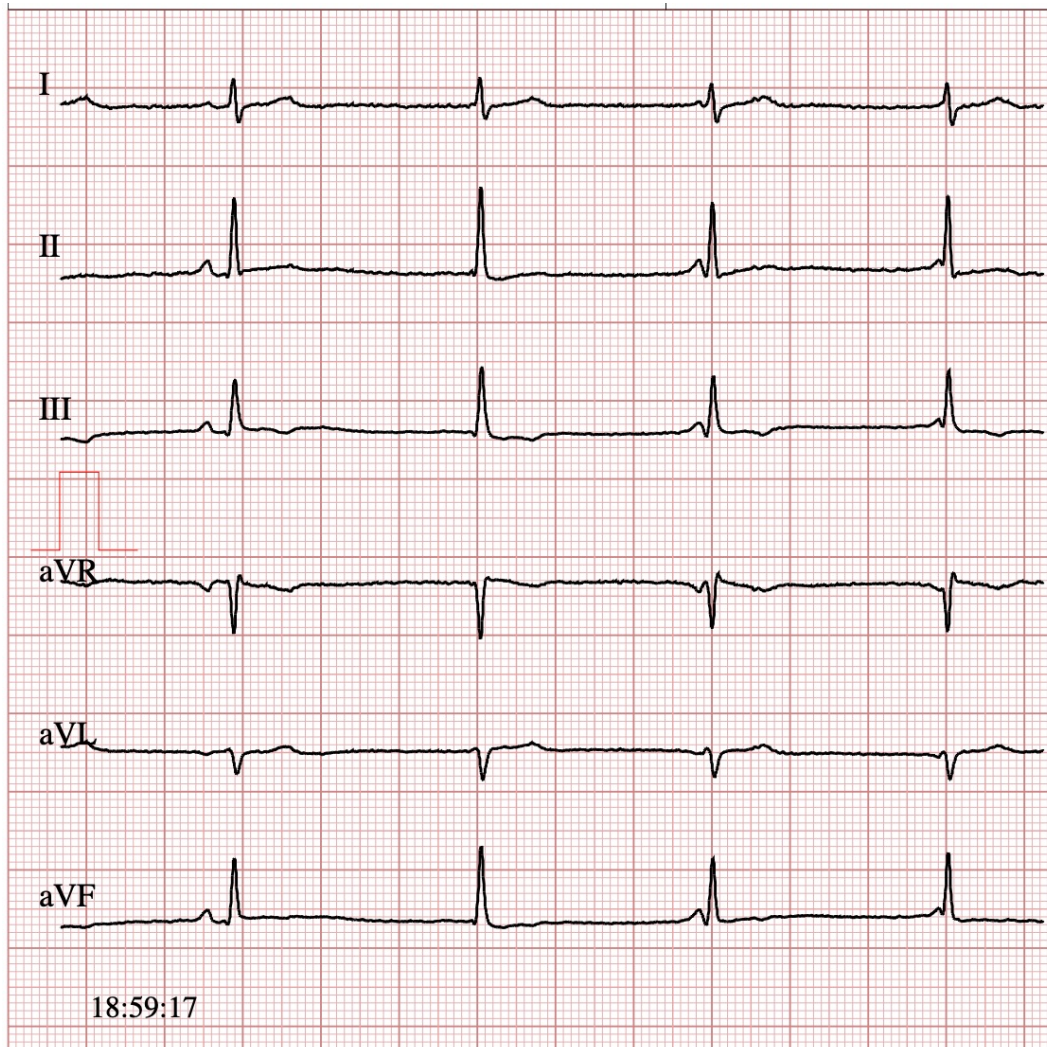
**Stimulateur cardiaque
uniquement si :**

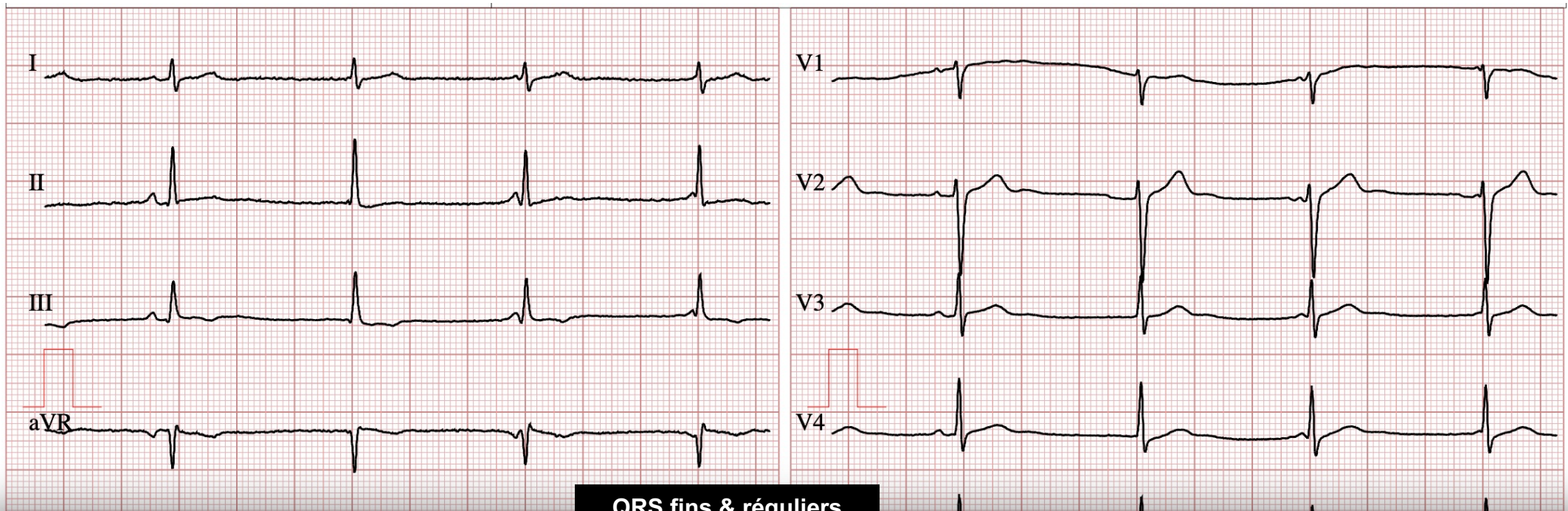
- **Symptômes**
- **Pauses prolongées**

En l'absence de cause
réversible

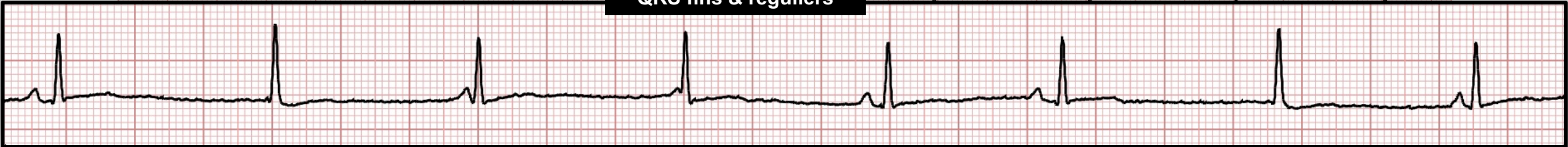
Varia







QRS fins & réguliers

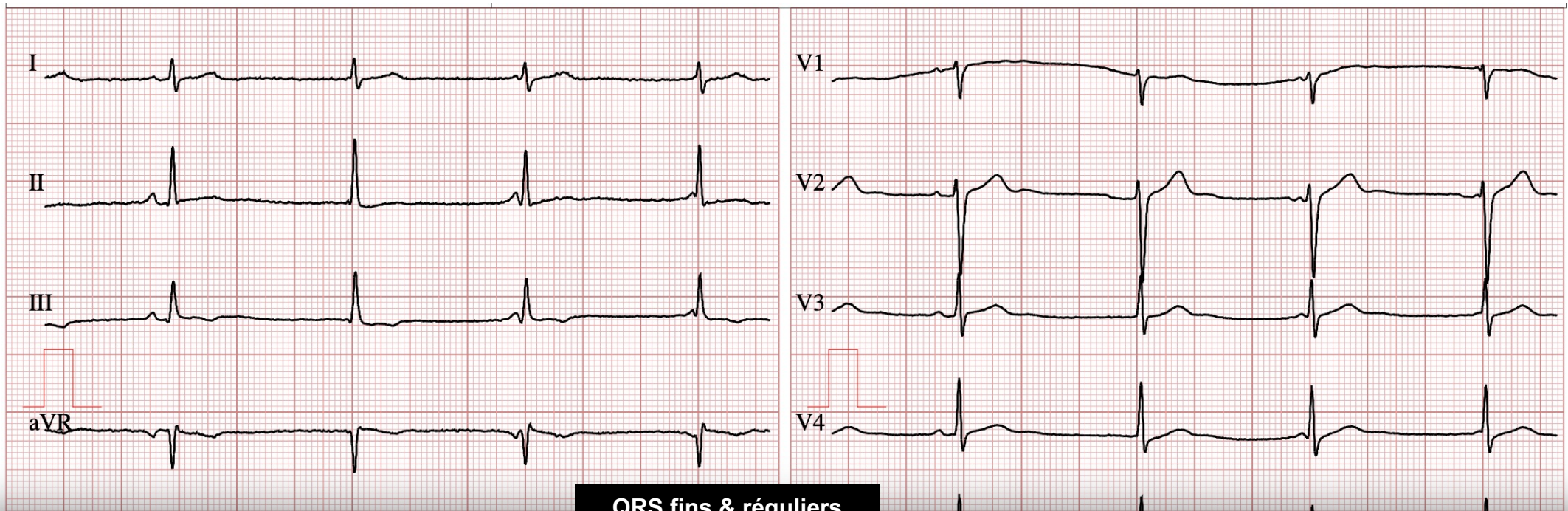


18:59:17

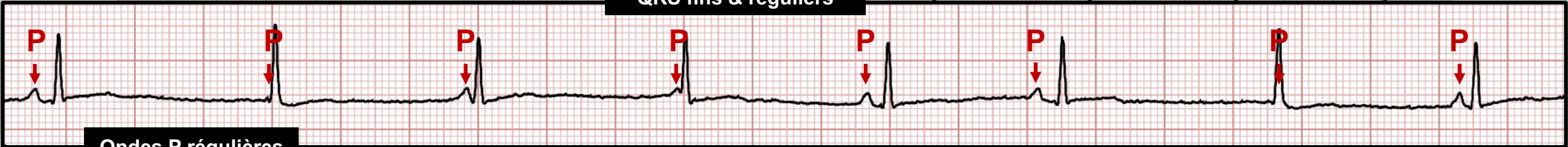
18:59:17



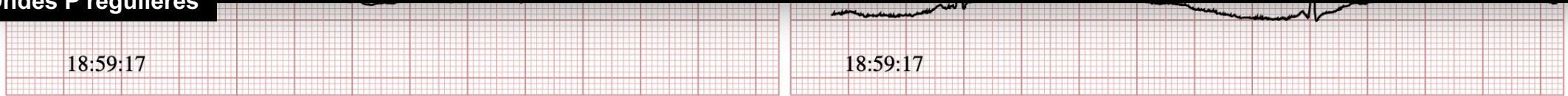
18:59:17

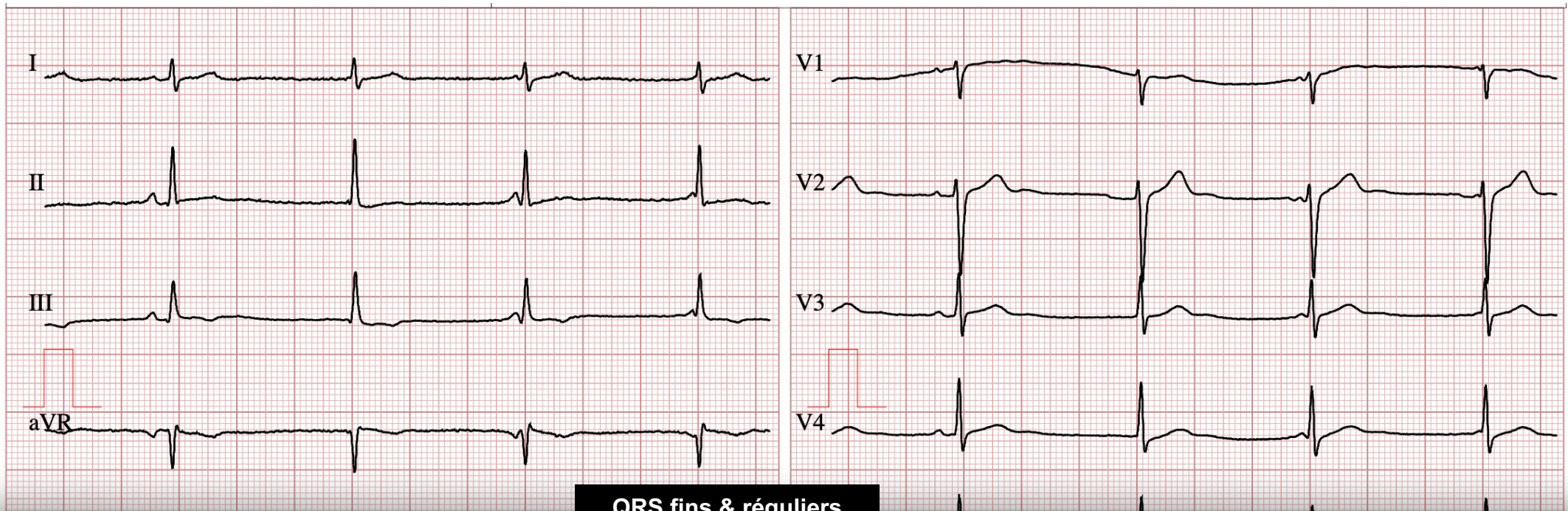


QRS fins & réguliers

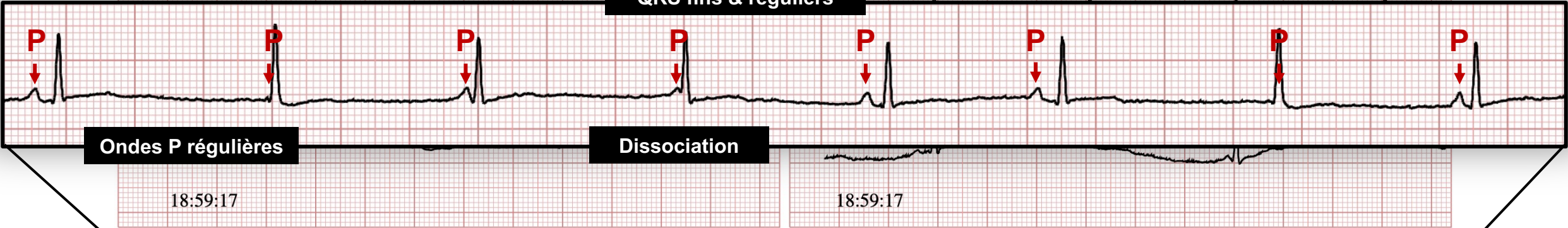


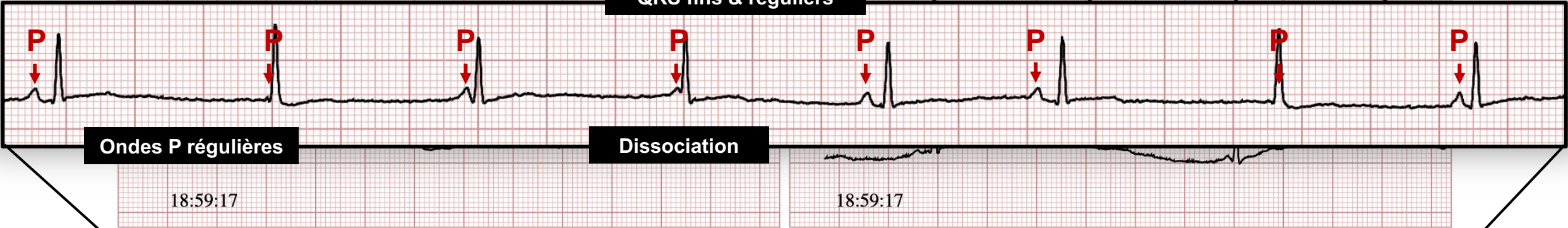
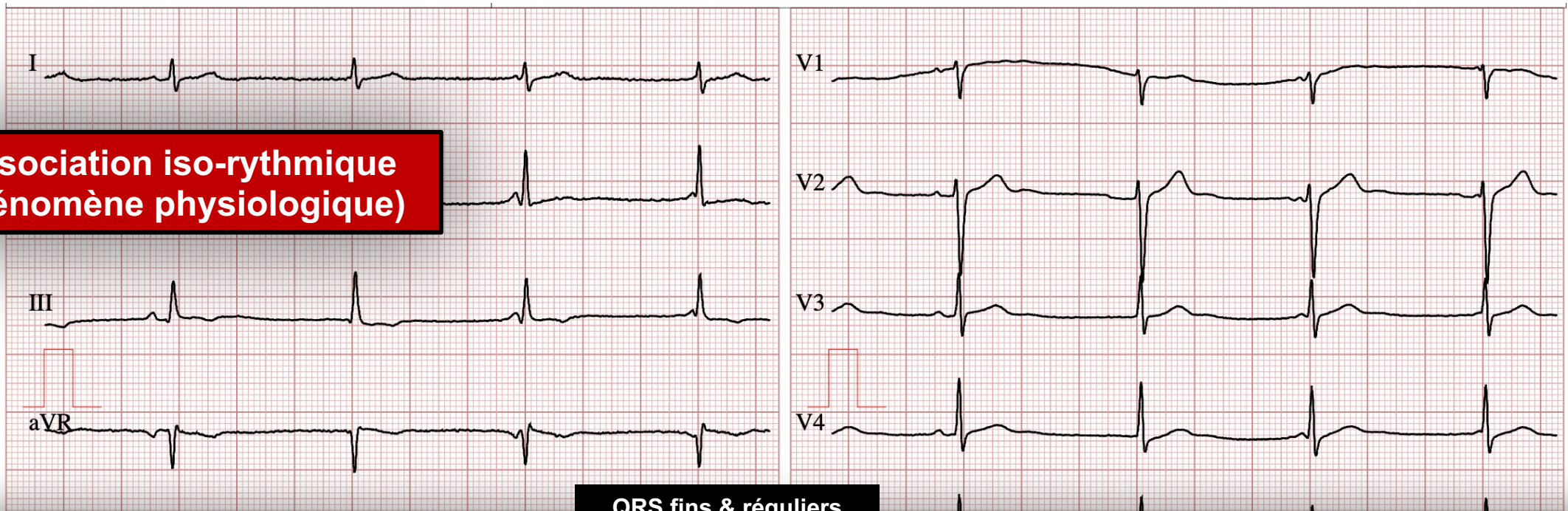
Ondes P régulières

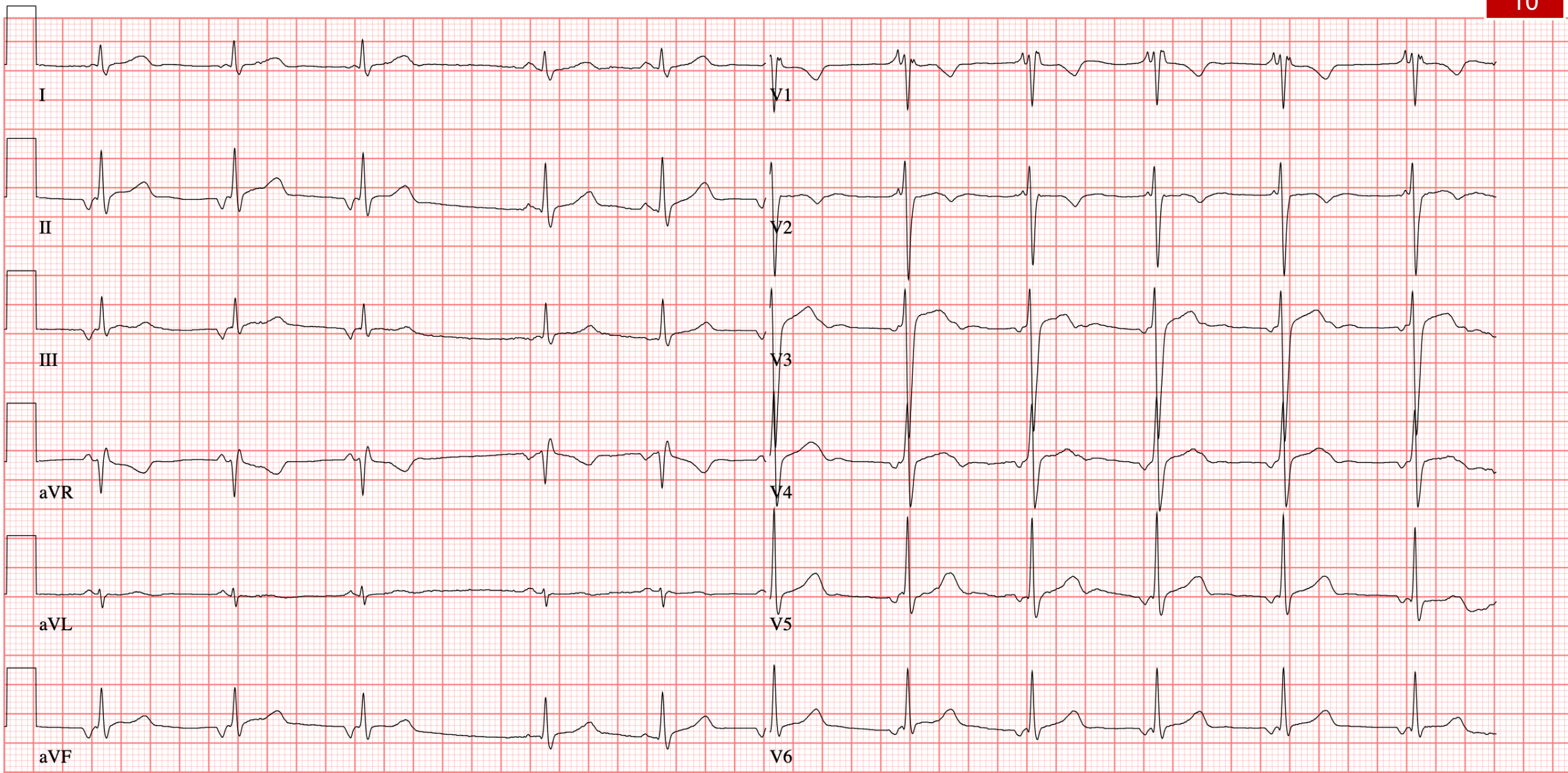


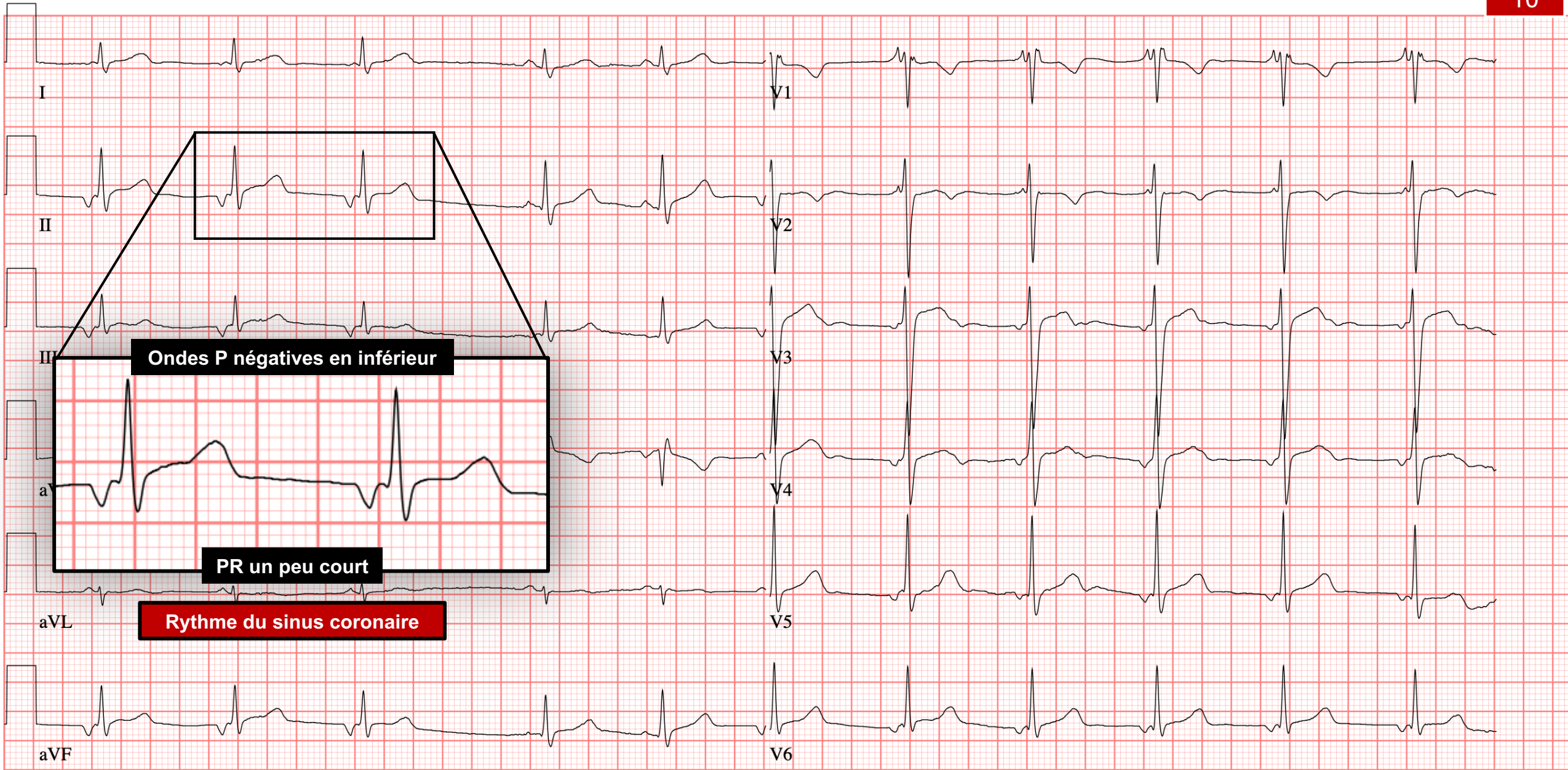


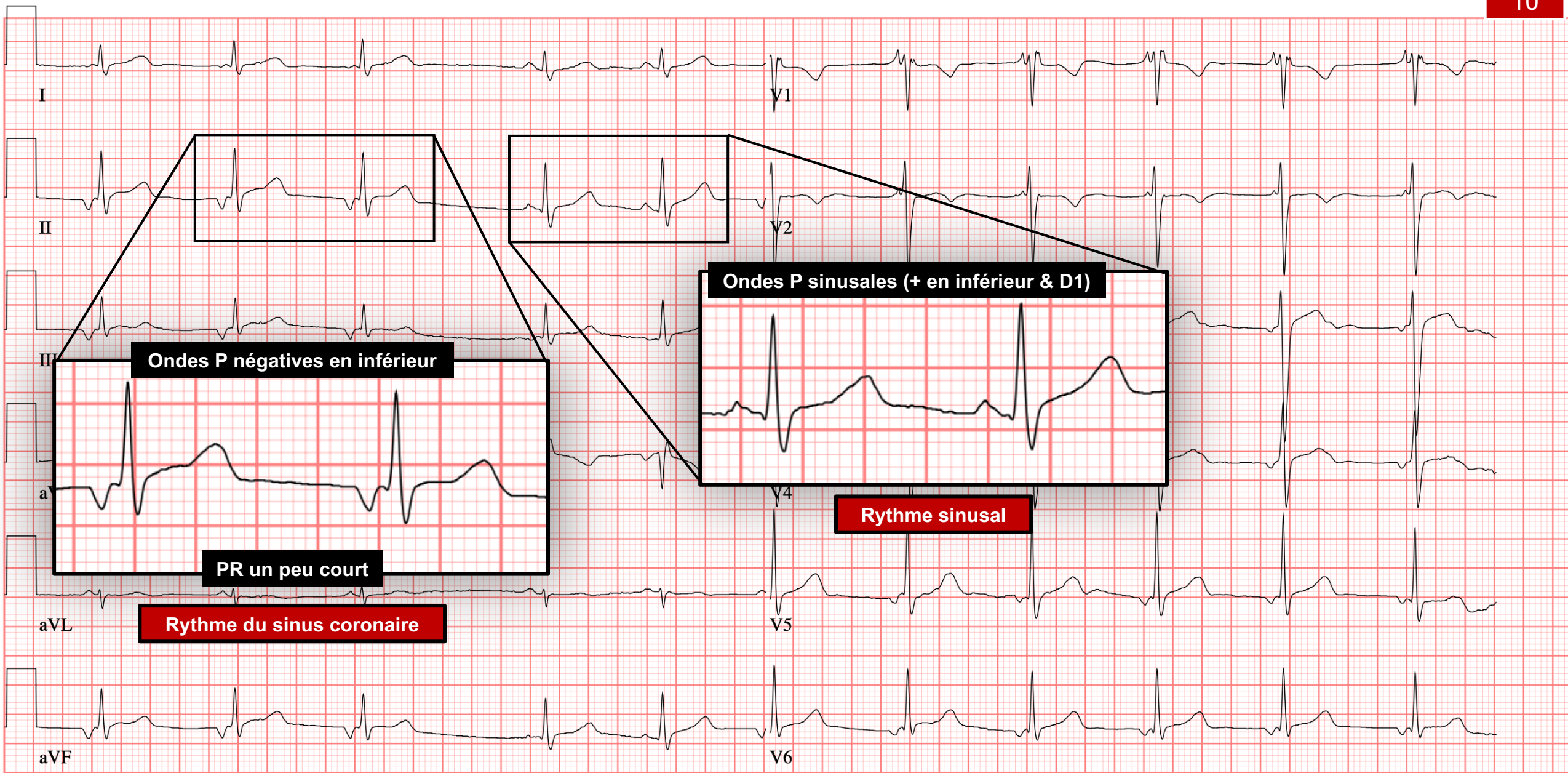
QRS fins & réguliers

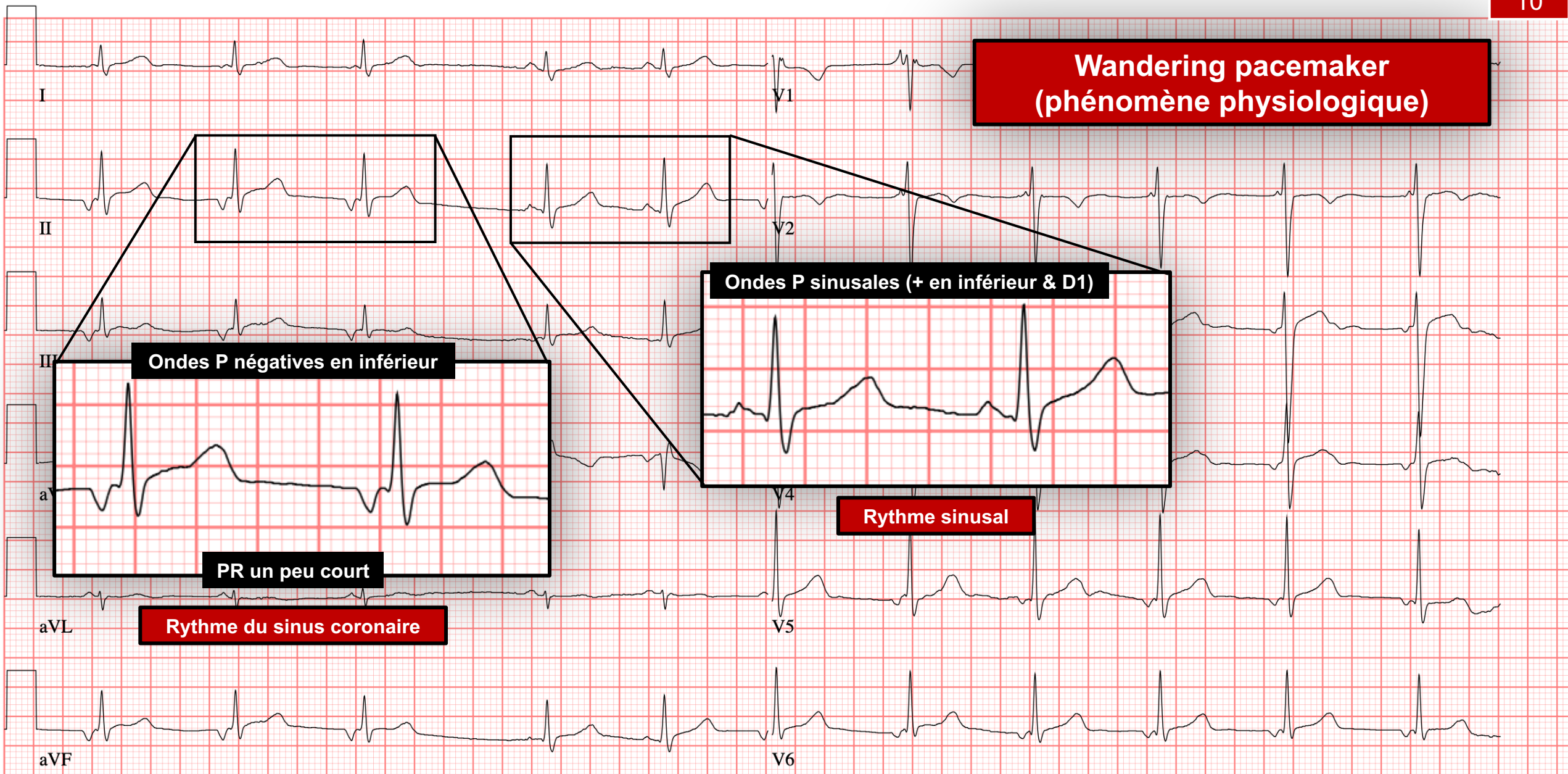


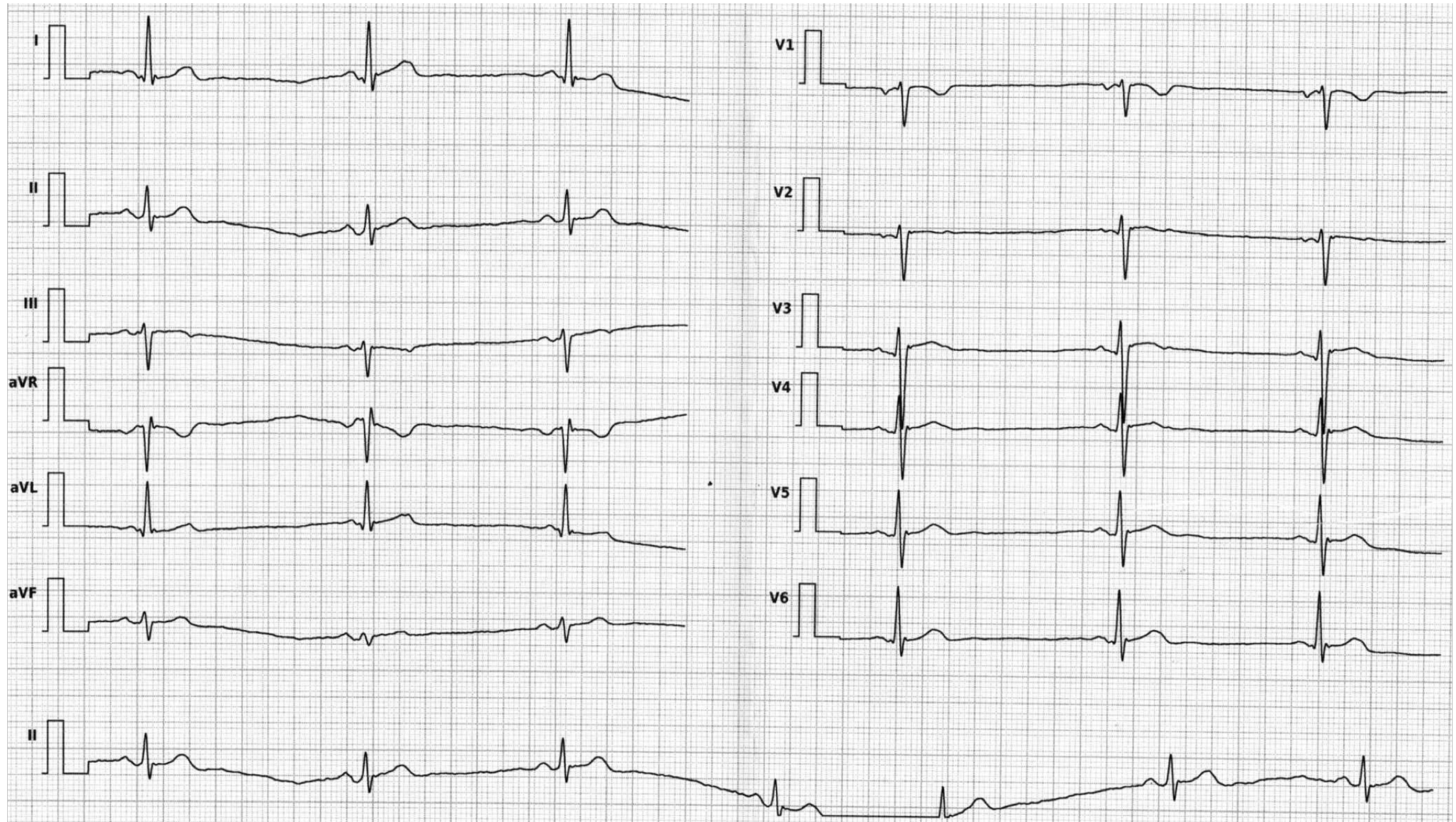


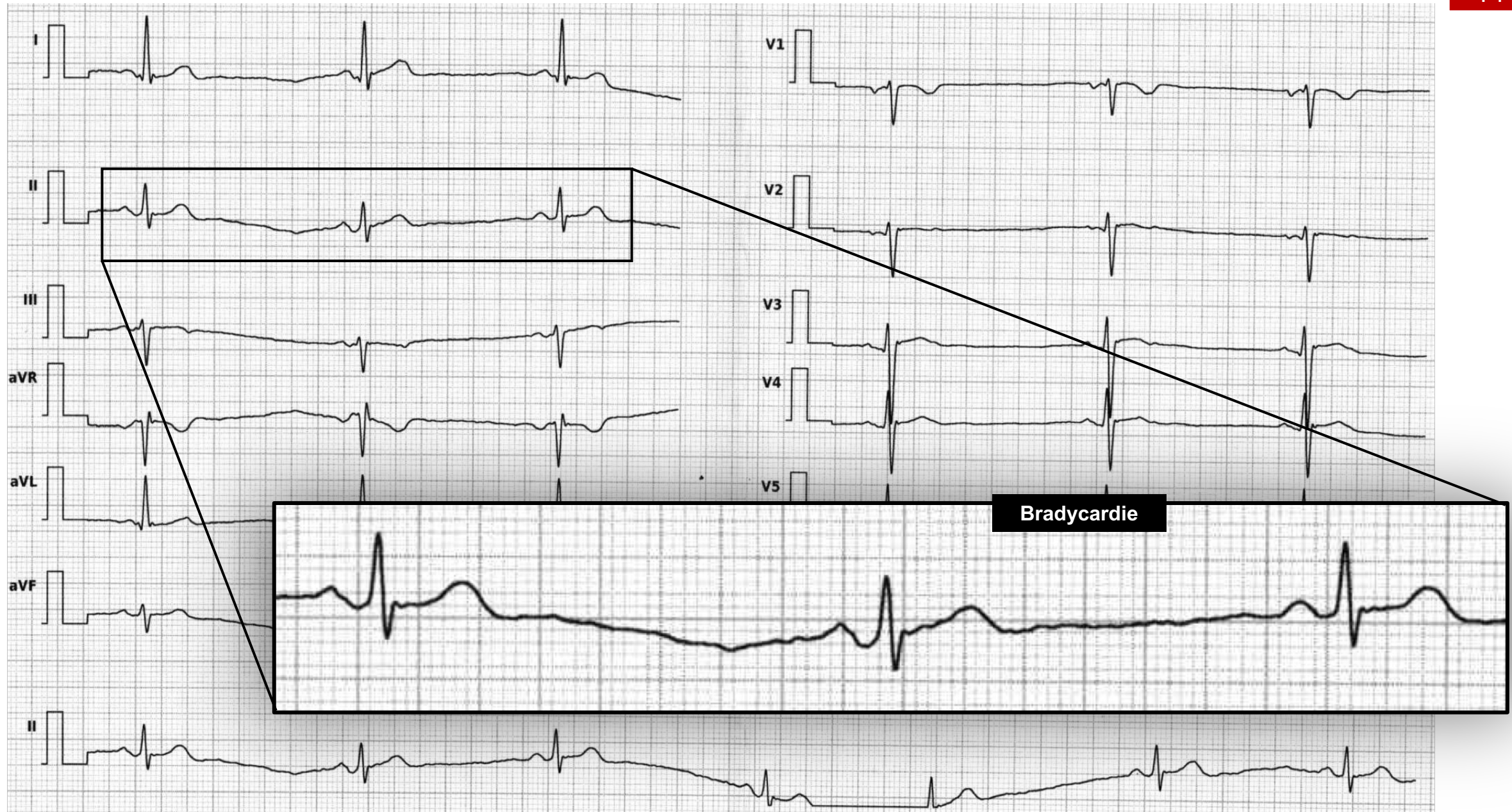


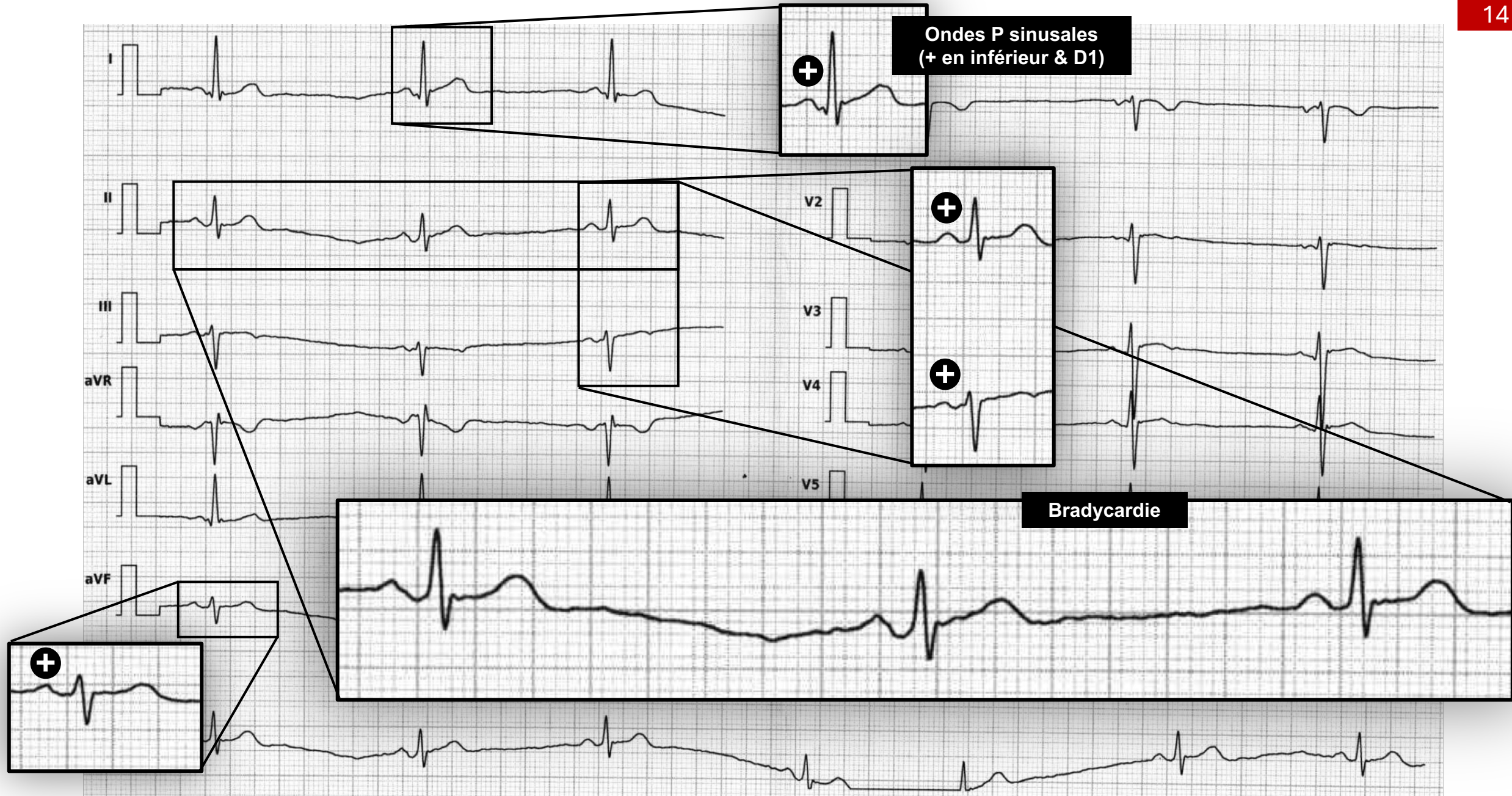


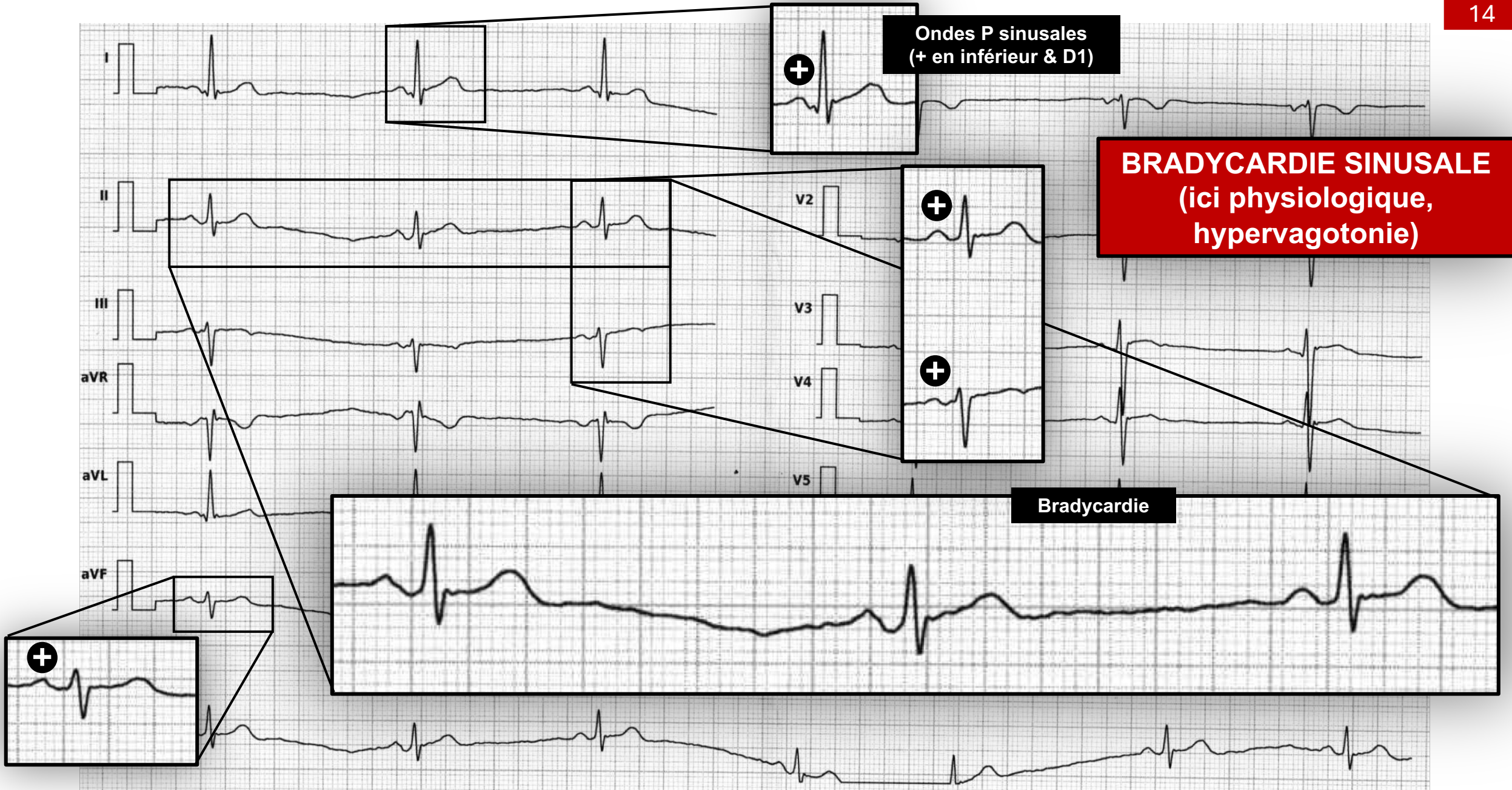


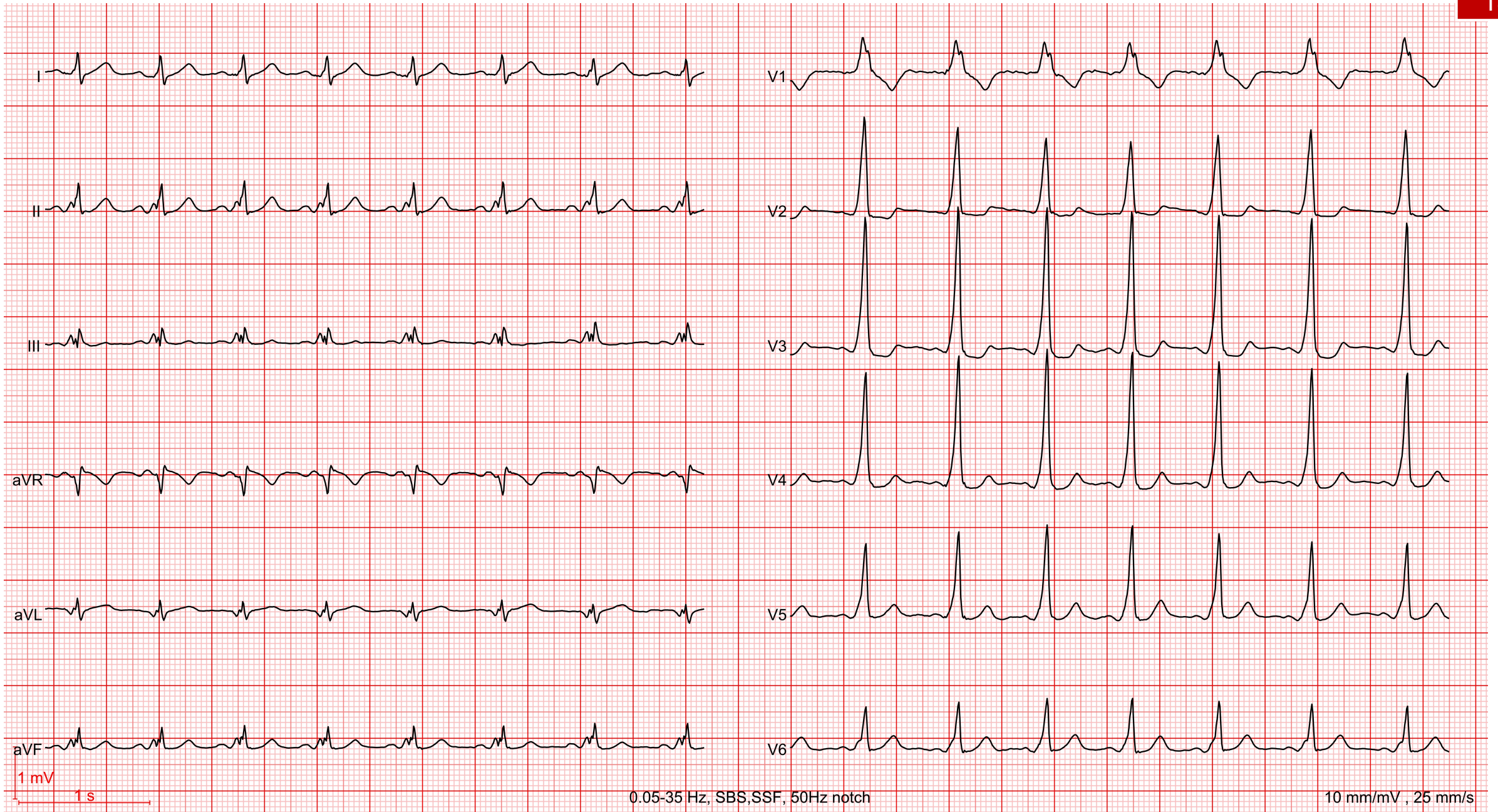


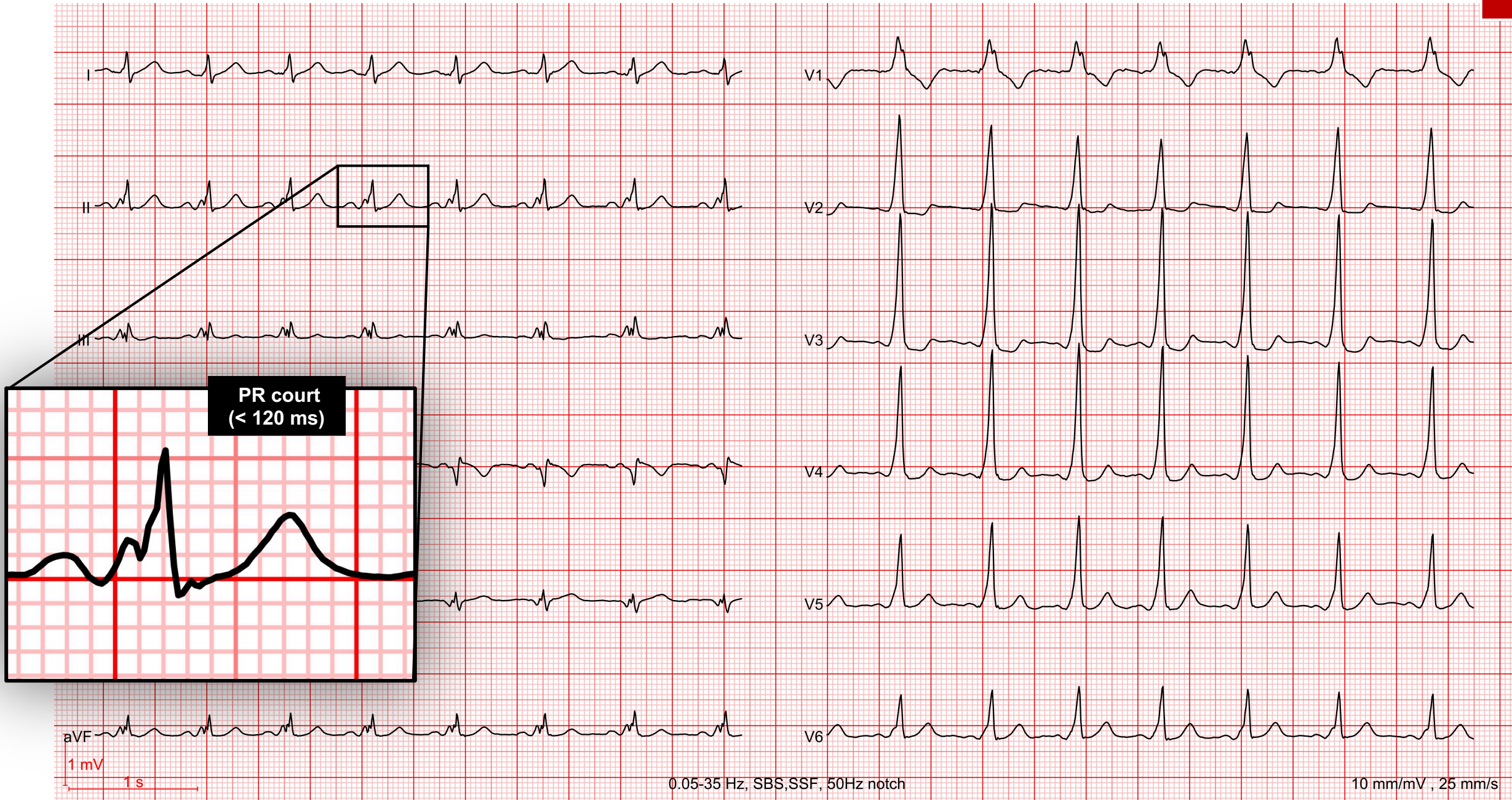


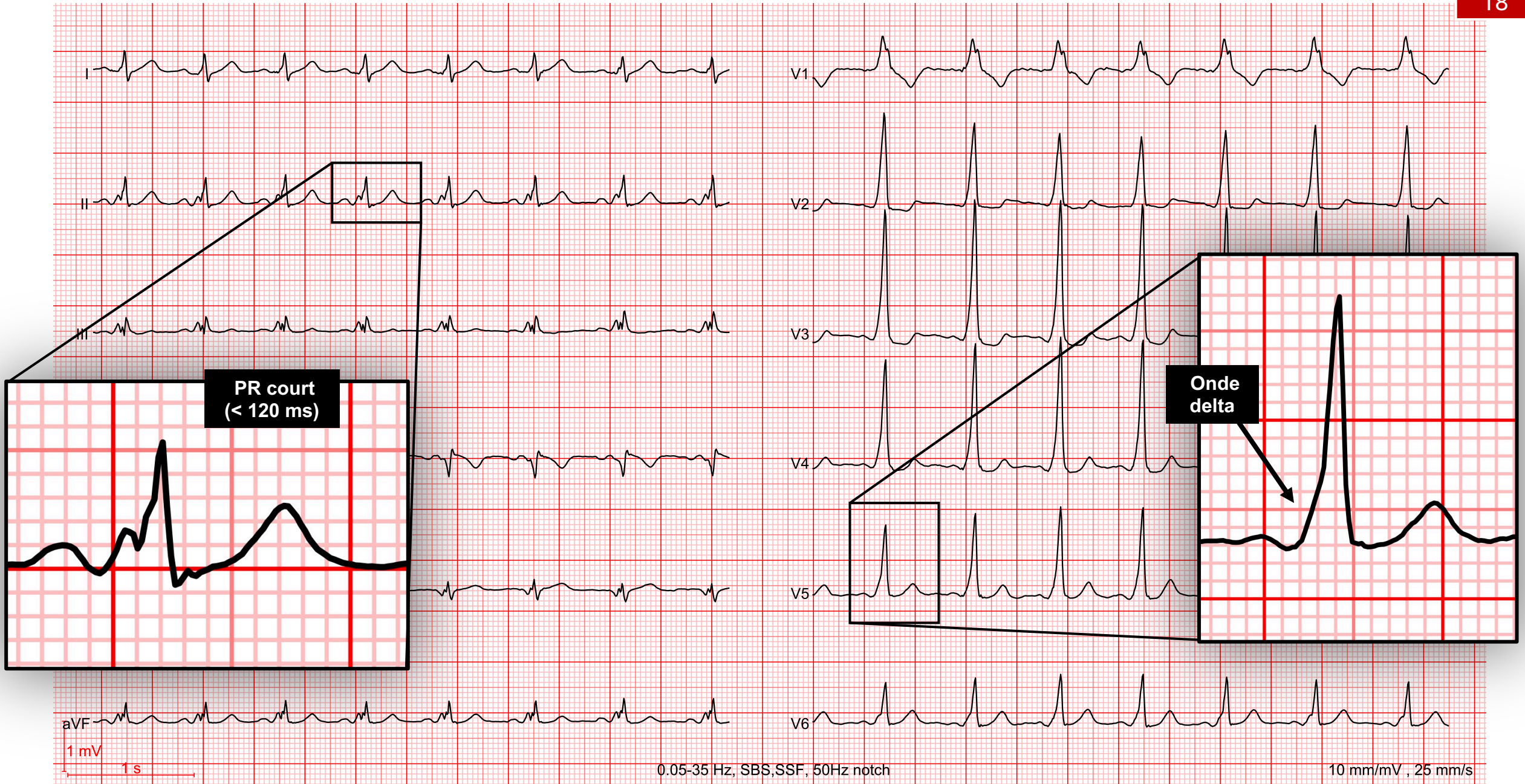


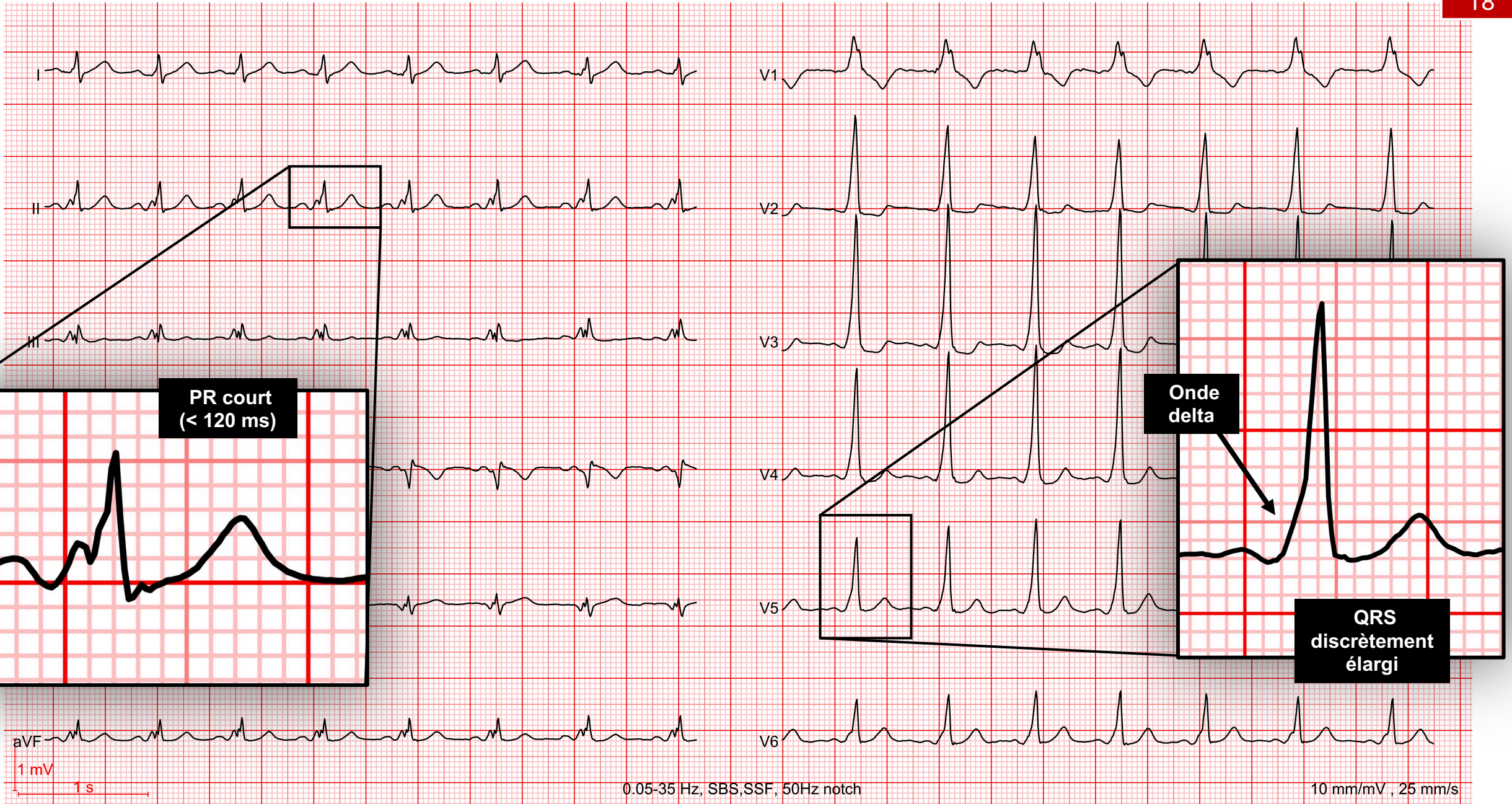












PRE-EXCITATION
(PR court, onde Delta, QRS discrètement élargi)

Correspondant ici à une
VOIE ACCESSOIRE LATÉRALE GAUCHE

Responsable d'un
SYNDROME DE WOLFF-PARKINSON-WHITE
(car arythmies paroxystiques)

PR court
(< 120 ms)

Onde delta

QRS
discrètement élargi

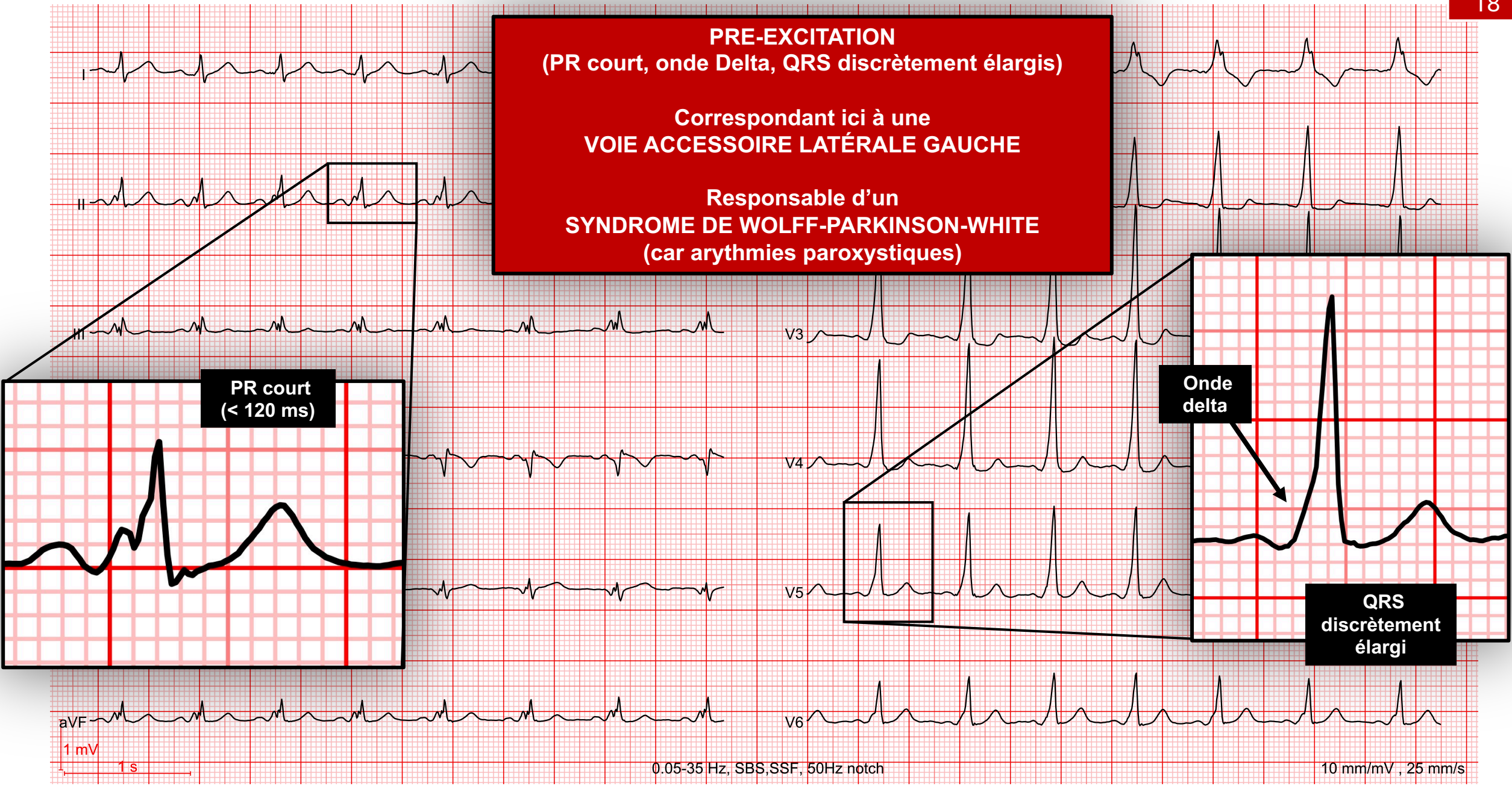
aVF

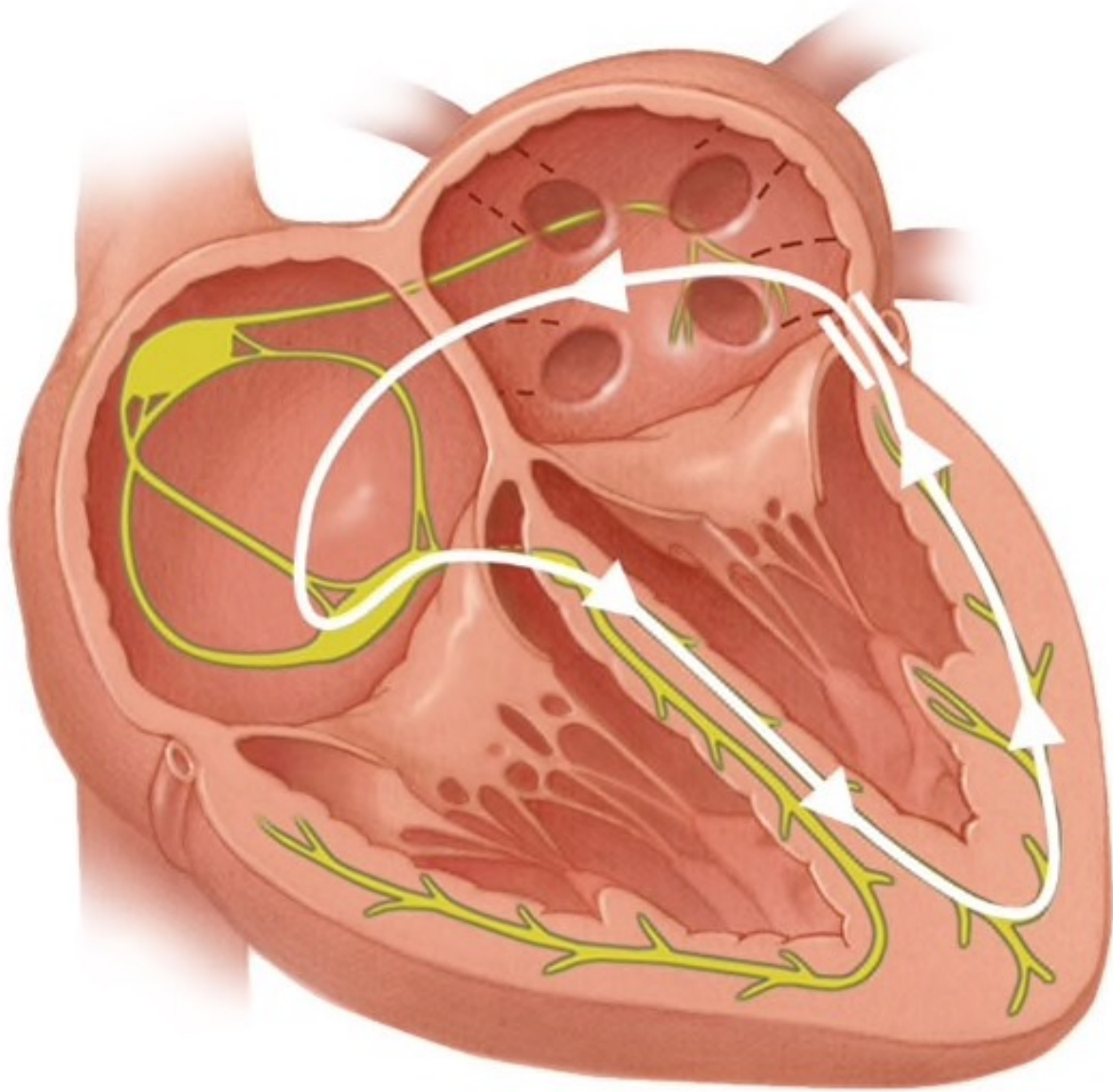
1 mV
1 s

V6

0.05-35 Hz, SBS,SSF, 50Hz notch

10 mm/mV, 25 mm/s





Persistance d'un pont musculaire embryologique autour d'une valve atrioventriculaire, shuntant le filtre nœud atrioventriculaire.

En cas d'arythmie dans l'oreillette risque de transmission en I:I aux ventricules et de MS

MERCI POUR VOTRE ATTENTION



antoine.deliniere@chu-lyon.fr



European
Reference
Network

for rare or low prevalence
complex diseases

Network
Heart Diseases
(ERN GUARD-HEART)



cardiogen

filière nationale de santé
maladies cardiaques héréditaires ou rares
www.filiere-cardiogen.fr



CERA
CEntre de Référence
des Arythmies
héréditaires - Lyon



Mechanisms in integrated Life Sciences

