

Clinical EP Studies Lab

Ravi Ranjan

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Normal ECG

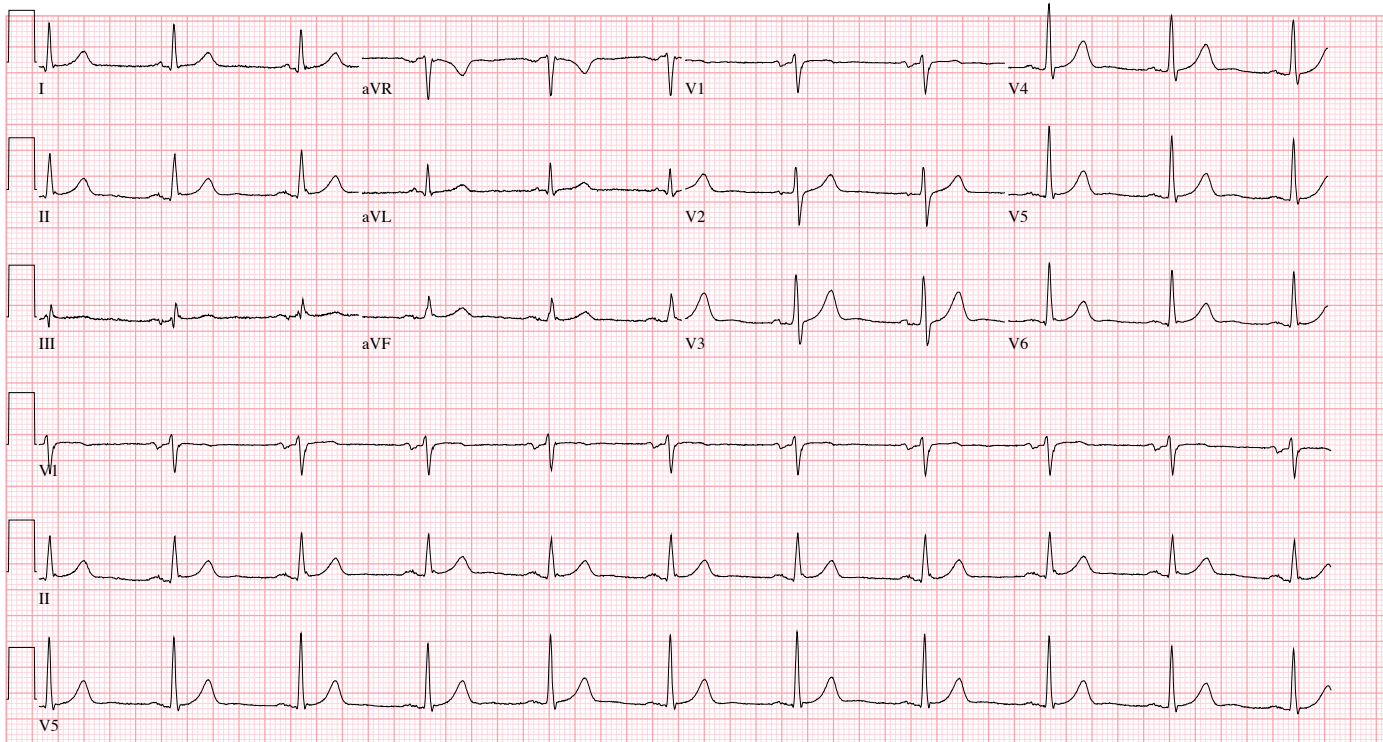
UNIVERSITY HEALTH CARE

Vent. rate	62	BPM
PR interval	154	ms
QRS duration	92	ms
QT/QTc	402/408	ms
P-R-T axes	36 38 40	

Technician: AMBER
Test ind:780.2

Referred by: MOHAMED HAMDAN

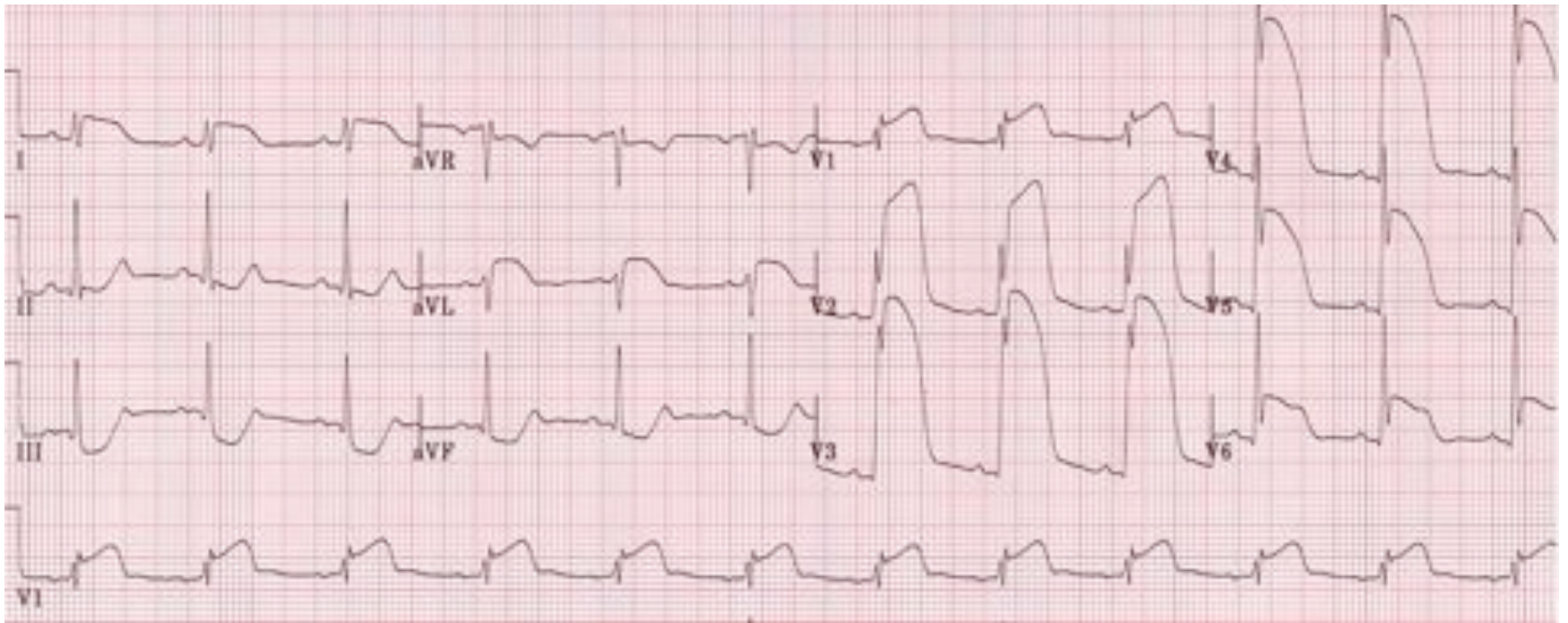
Confirmed By: Ravi Ranjan



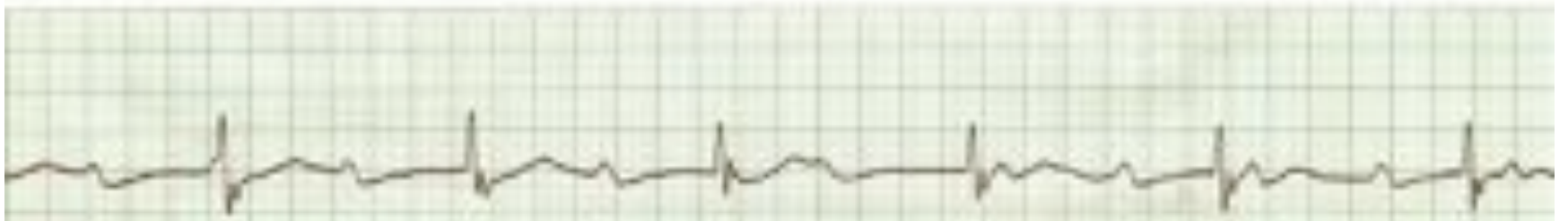
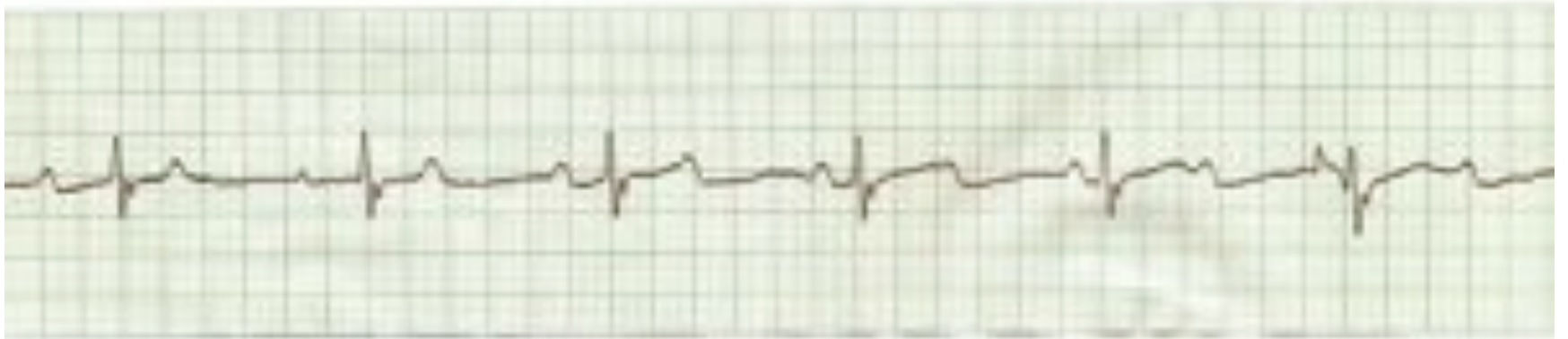
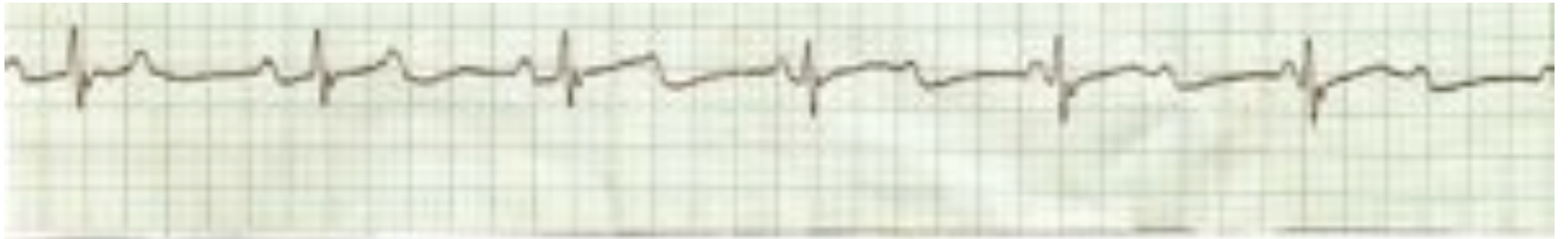
STEMI



STEMI



Heart Block



2:1 Heart Block



LBBB

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Vent. rate	64	BPM
PR interval	234	ms
QRS duration	184	ms
QT/QTc	516/532	ms
P-R-T axes	-23 -57	117

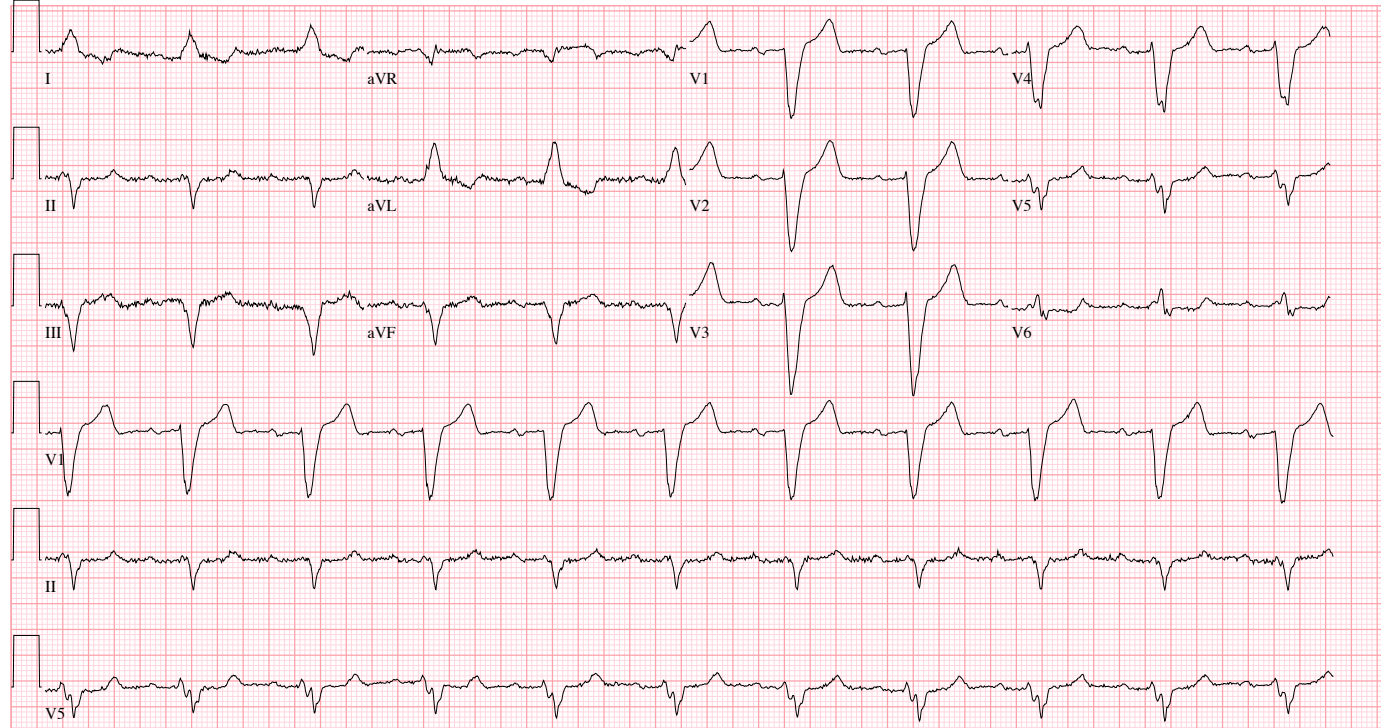
Technician: TSS
Test ind: VT

Referred by: HAMDAN

Confirmed By: Ravi Ranjan

Comment: 185310459

Study:



RBBB

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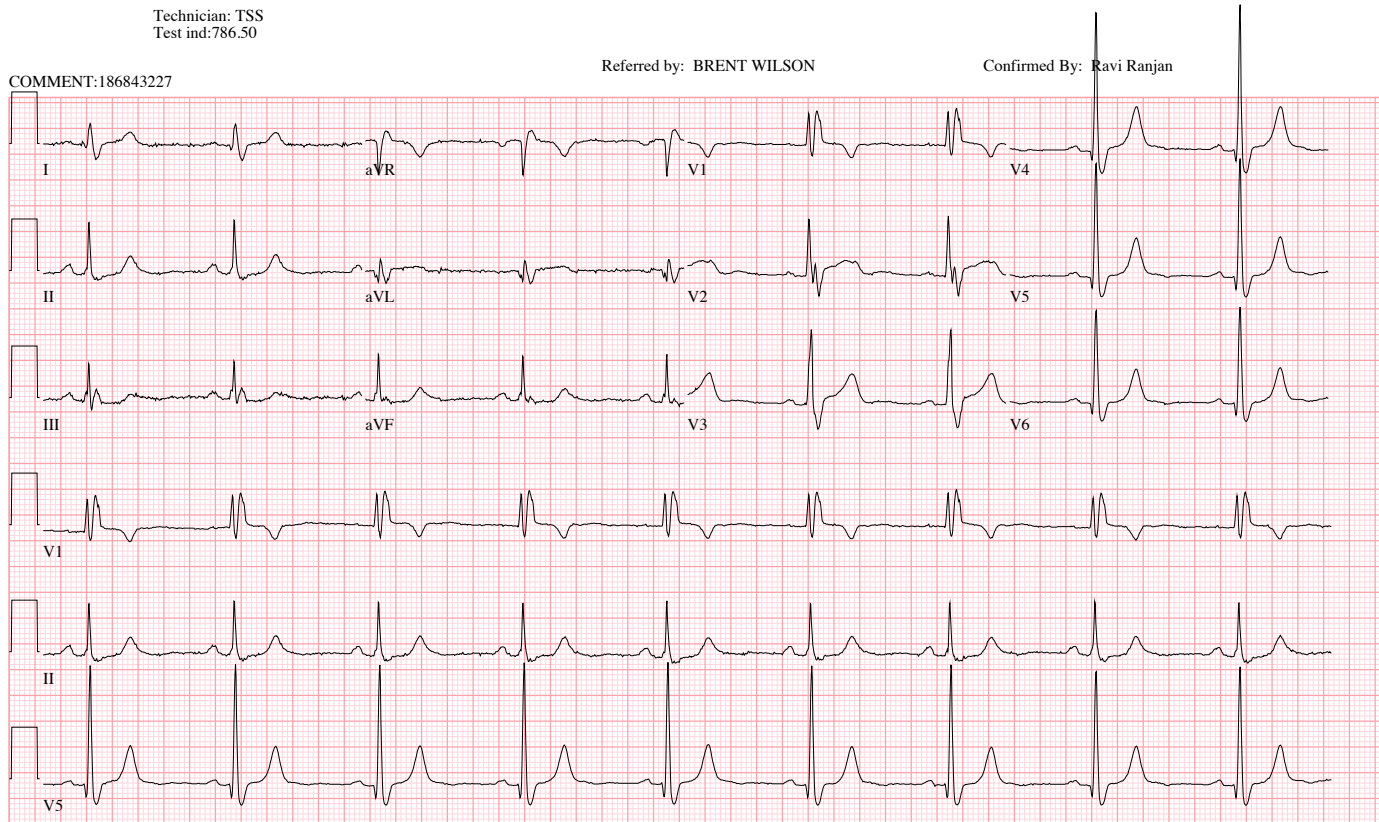
Vent. rate	53	BPM
PR interval	174	ms
QRS duration	138	ms
QT/QTc	458/429	ms
P-R-T axes	76 78	46

Technician: TSS
Test ind:786.50

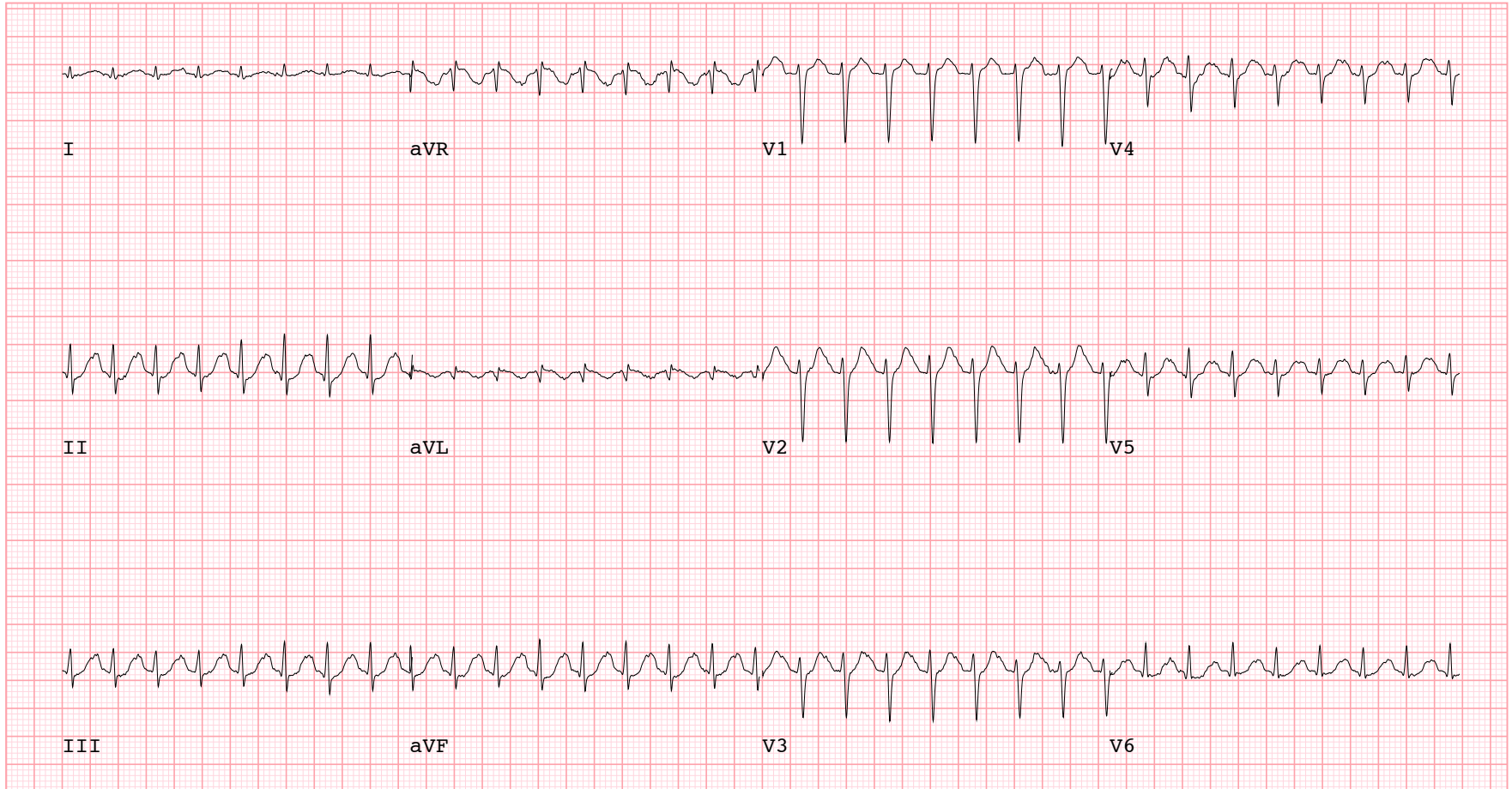
Referred by: BRENT WILSON

Confirmed By: Ravi Ranjan

COMMENT:186843227



Supra Ventricular Tachycardia



GE Medical Systems IT
CASE V5.02

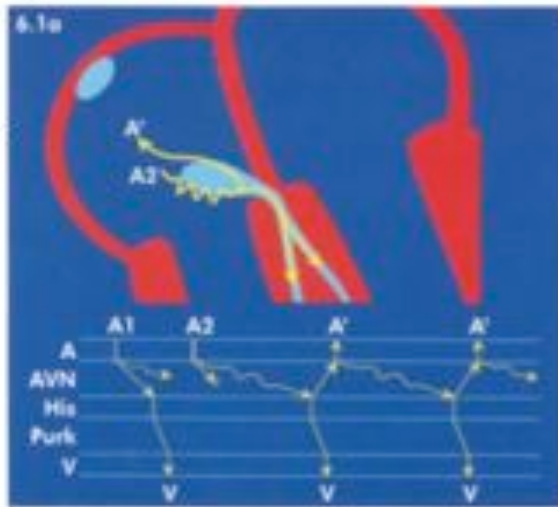
25mm/s 10mm/mV 60Hz 0.01-40Hz S+ HR(V1,V2)

Supra Ventricular Tachycardia (SVT)

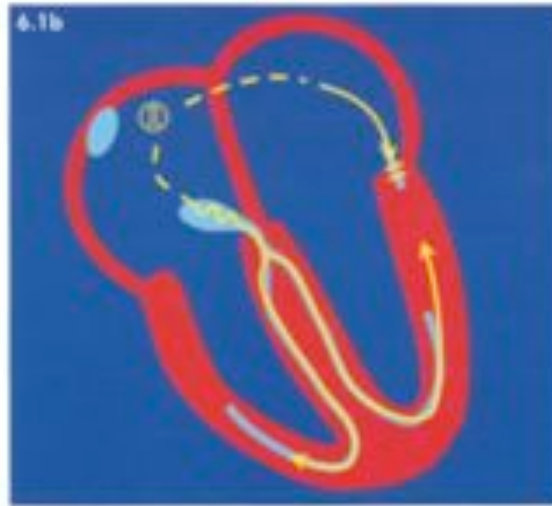
- AVNRT – AV nodal re-entrant tachycardia
- AVRT – Atrio-ventricular re-entrant tachycardia
- AT – atrial tachycardia

SVT initiation

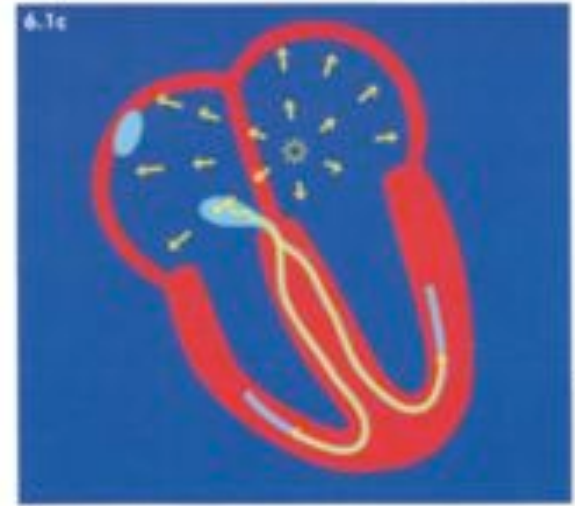
AVNRT
AV nodal re-entrant
tachycardia



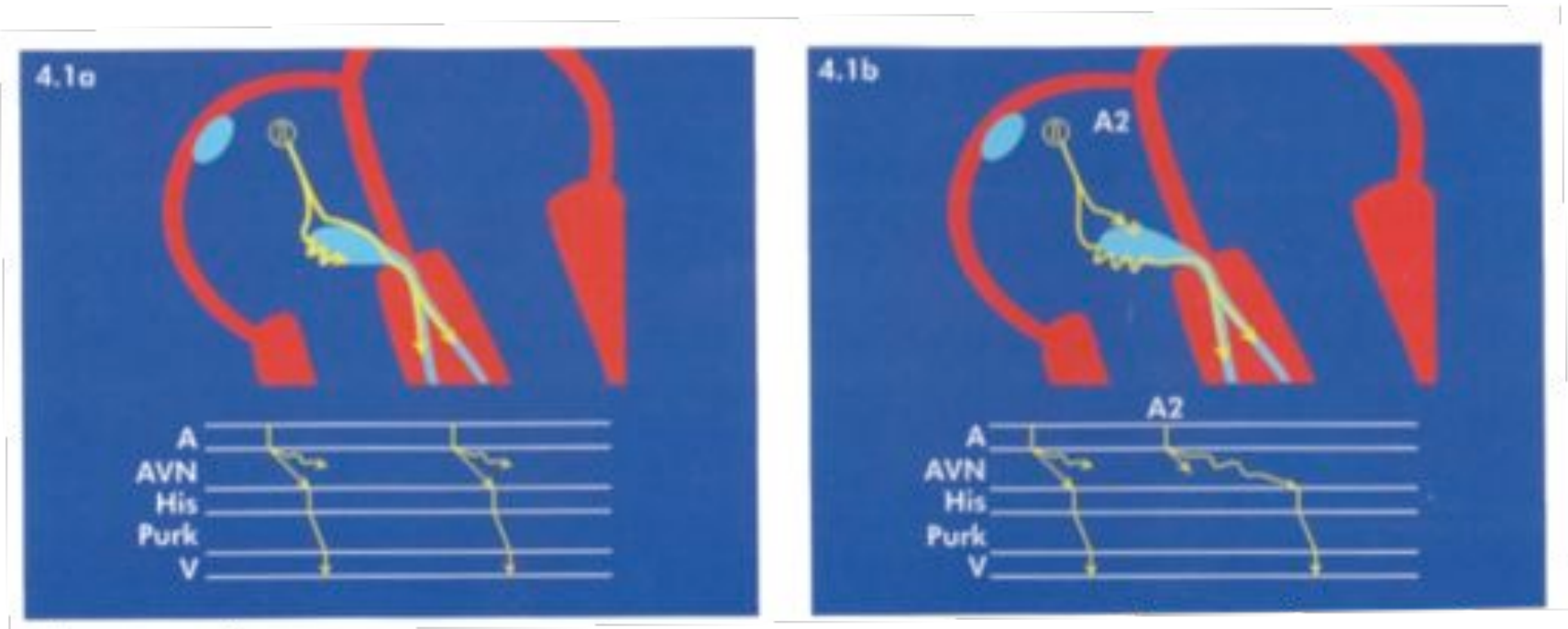
ORT
Orthodromic re-entrant
tachycardia



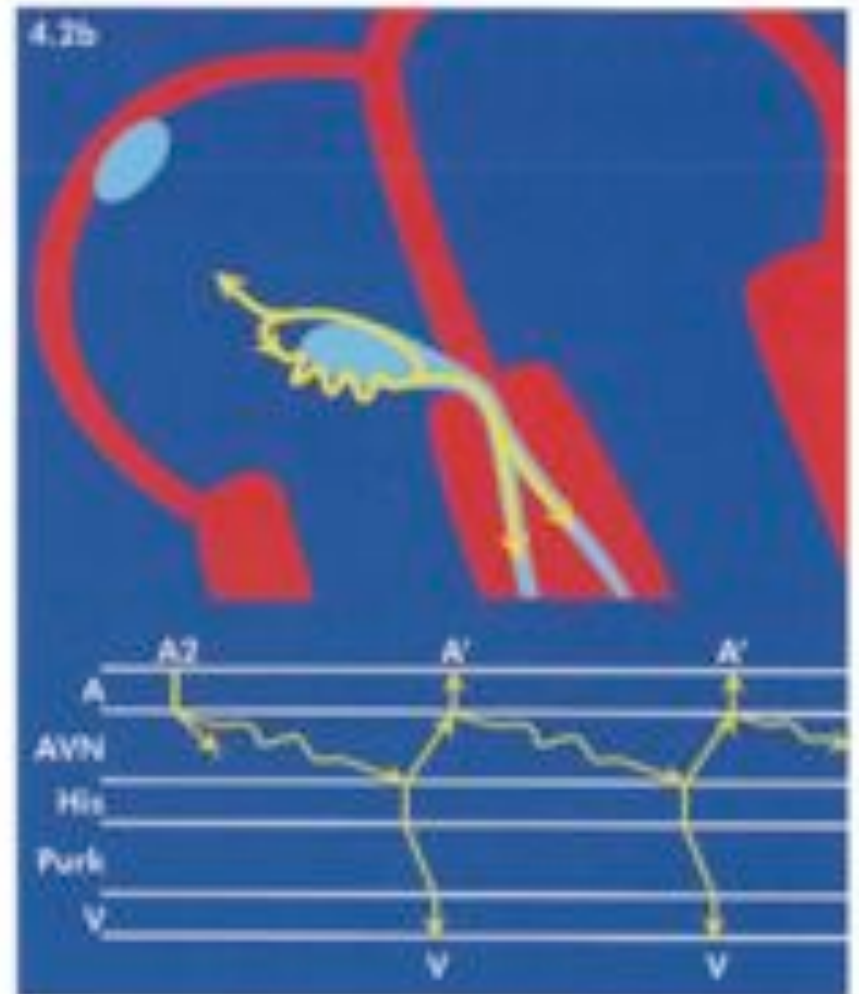
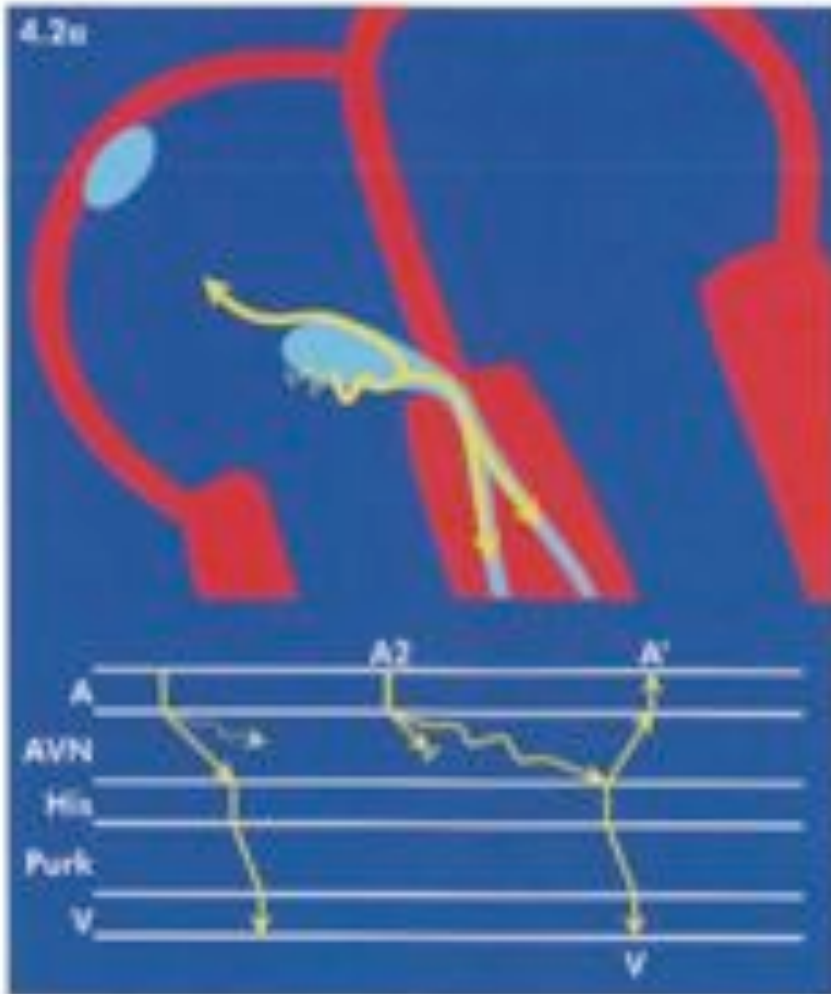
AT
Atrial Tachycardia



Dual Node Pathway



AVNRT



Basic EP recordings

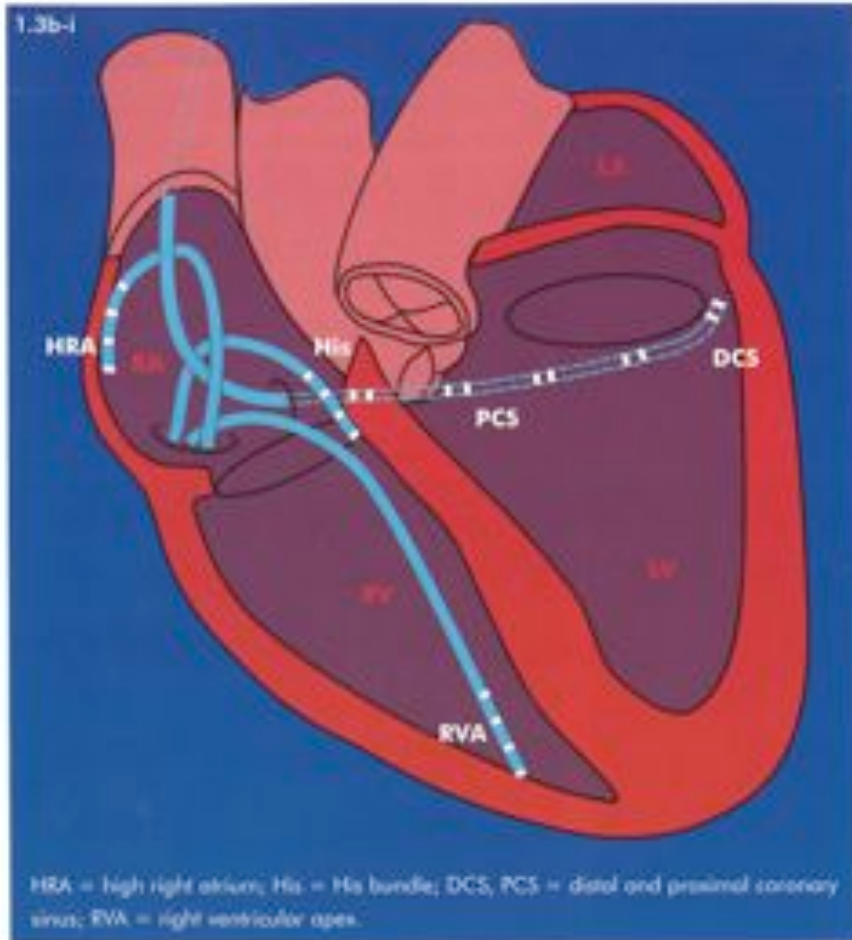
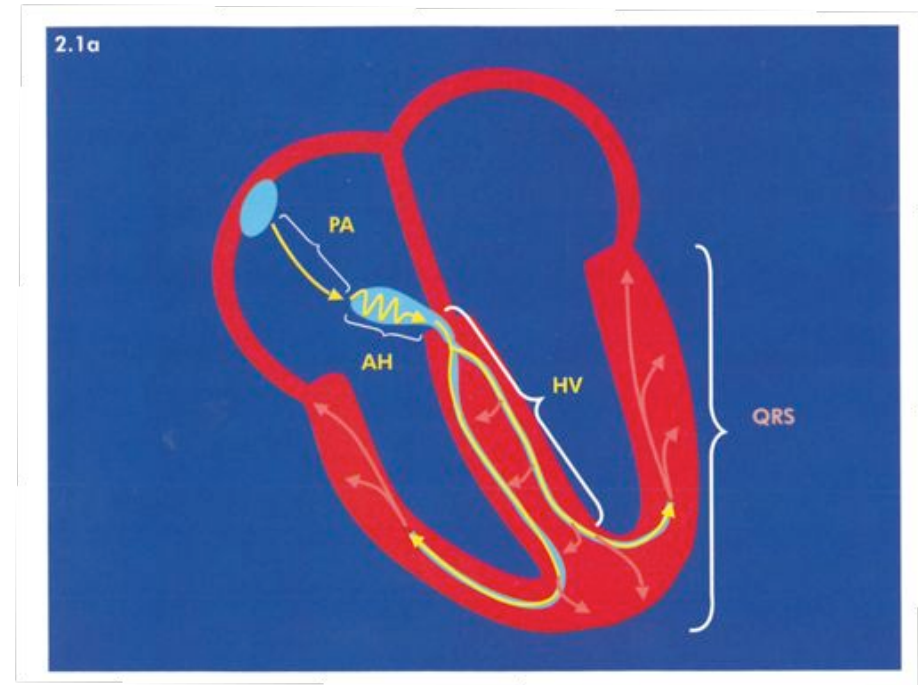
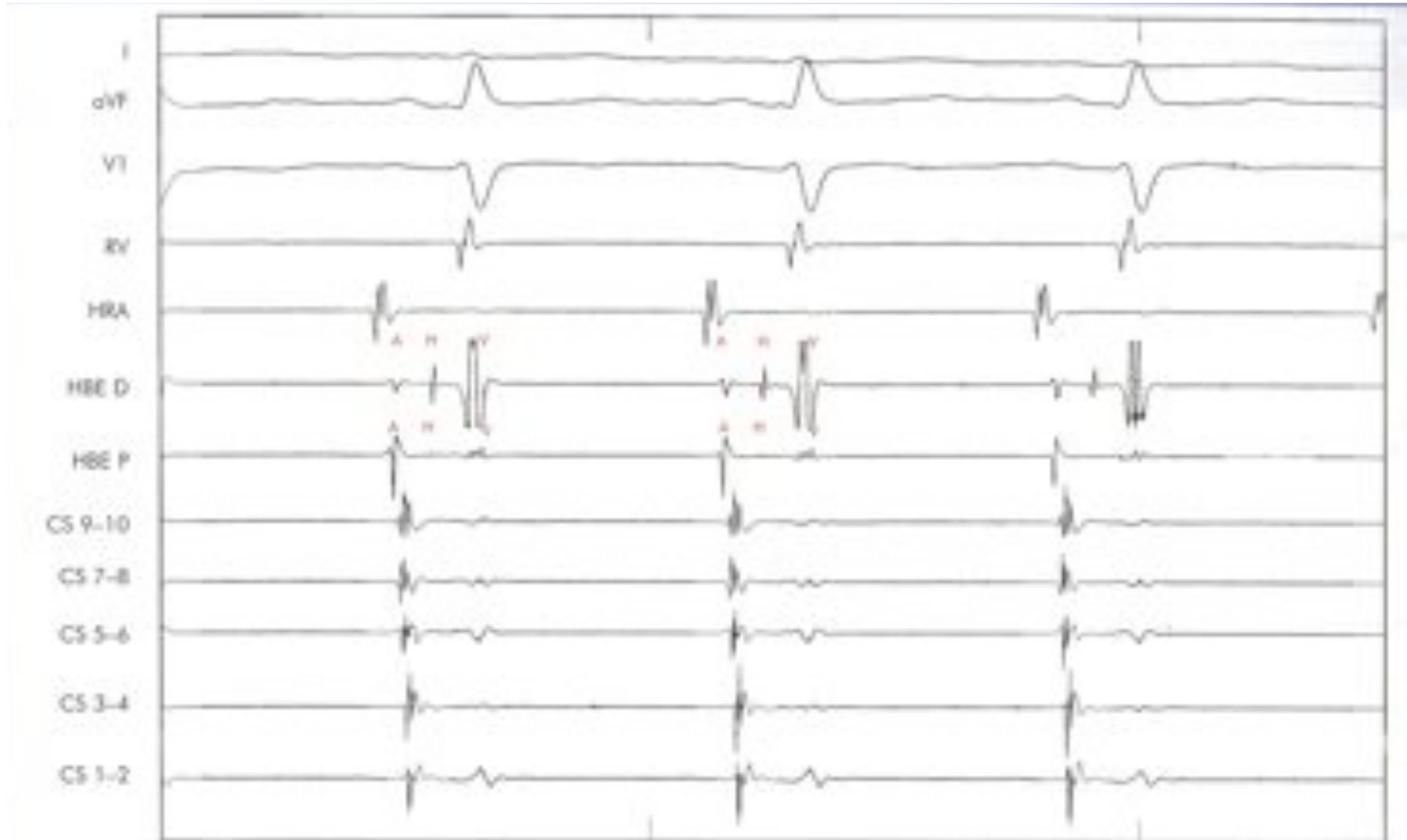


Figure 1.3b-1 illustrates the standard catheter positions for a 'four-wire' diagnostic EP study.

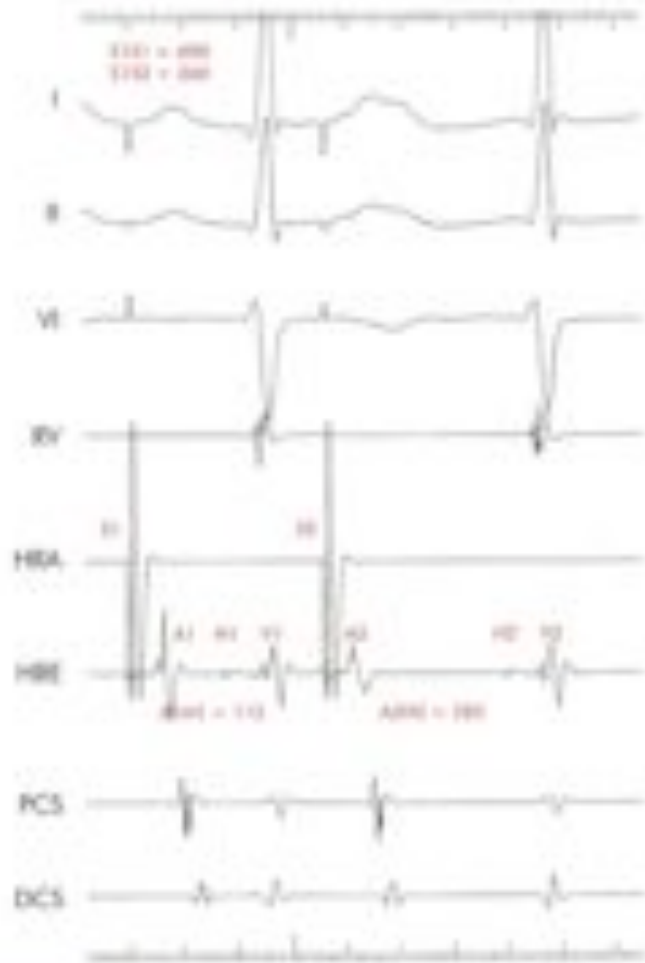


Basic EP recordings



Tracing 1.3 Electrograms displayed during standard four-vire study in sinus rhythm. Although all twelve surface ECG leads are recorded, only three approximately orthogonal leads are shown, for clarity. The right ventricular apex (RV) and high right atrium (HRA) leads show sharp single chamber electrograms. The His bundle catheter records activity adjacent to the AV node, the distal bipole (HBE D) showing the His bundle electrogram (H) and the adjacent ventricular myocardium (V), while the proximal bipole (HBE P) shows a large atrial electrogram (A). Note that, although the ventricular spike recorded by the His bundle comes from tissue adjacent to the bundle of His, the earliest ventricular activity is at the apex (RV). The electrograms recorded by the bipolar of the decapolar coronary sinus catheter are labeled CS 9-10 (proximal) to CS 1-2 (distal), each shows a sharp atrial electrogram followed by a smaller ventricular electrogram.

Dual Node Pathway



Tracing 4.1a Following an atrial drive train (A1A2) = 400 ms, an atrial premature stimulus is given (A3) = 300 ms. The AH interval of the premature stimulus (AH2) is greater than that of the drive train (AH1) because of decrement in the AF node.



Tracing 4.1b An atrial premature stimulus is delivered in the same patient, with a slightly shorter coupling interval (A3) = 300 ms, (A2) = 200 ms. The AH2 is less than the ERP of the fast pathway, which blocks, and the impulse can now only conduct down the slow pathway. The AH interval of the premature stimulus increases from 200 to 210 ms, a "jump" of 10 ms.

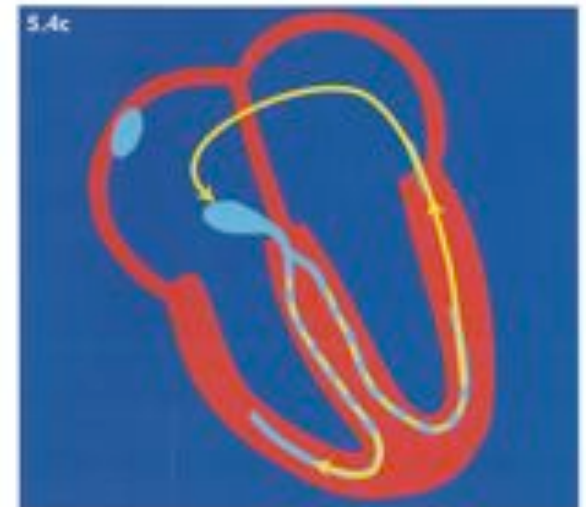
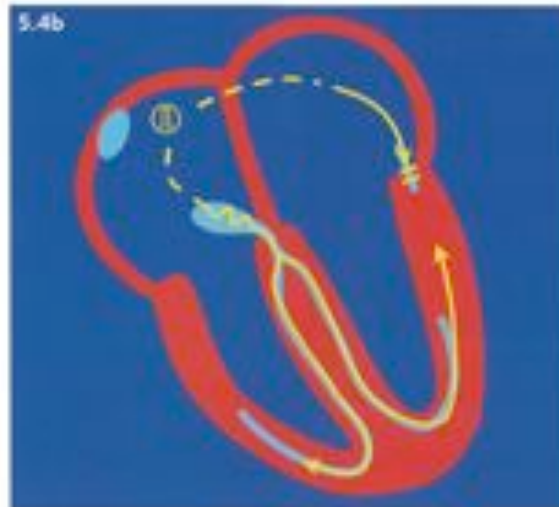
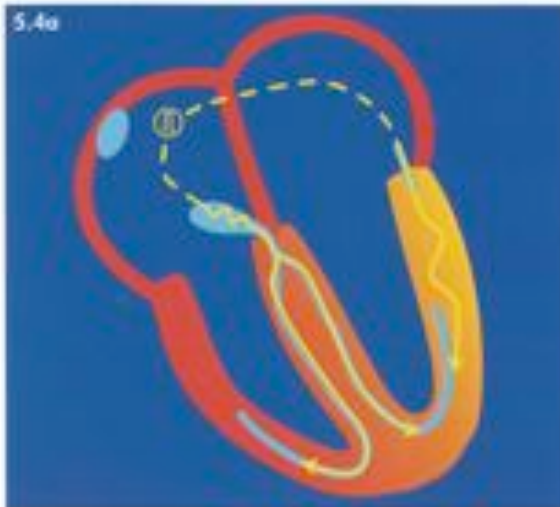
AVNRT



Tracing 8.7a The onset of tachycardia may differ according to the tachycardia mechanism. AV nodal reentry is induced by an atrial ectopic focus, which results in block in the fast pathway and conduction over the slow pathway. The AVF prolongation is obvious but the mechanism can also be seen in the surface leads.

AVRT – initiation

Orthodromic Re-entrant Tachycardia (ORT)

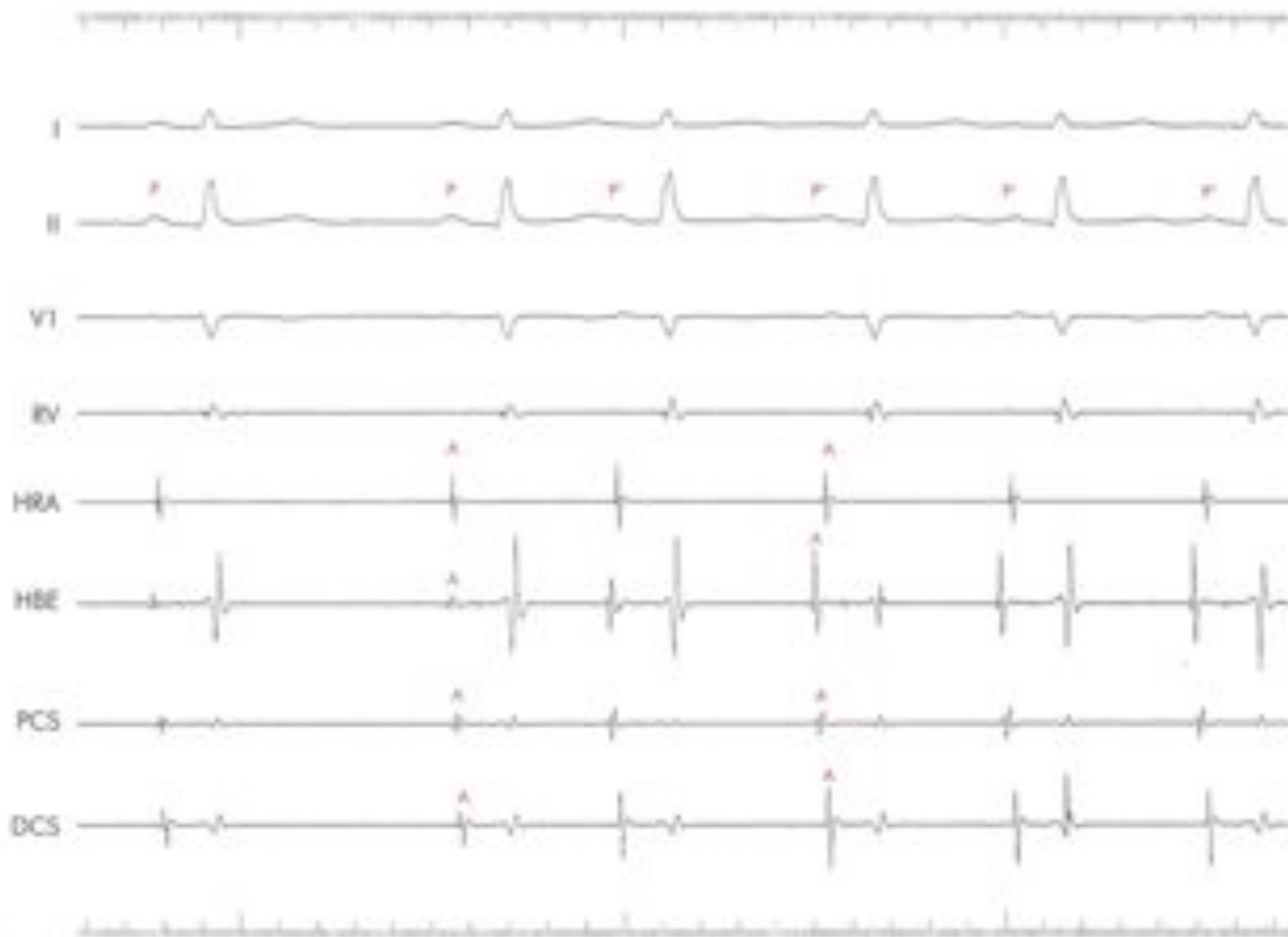


ORT



Tracing 4.1b Orthodromic AVRT is induced by an atrial extrasystole. The key element of induction of tachycardia is block in the accessory pathway with loss of pre-excitation (*), allowing retrograde conduction up the accessory pathway to the atrium, thereby completing the circuit (see Section 5.4).

AT



Tracing 6.1c In this example, the onset of atrial tachycardia is accompanied by a trivial increase in the AH interval, related to the increased atrial rate. However, subtle changes occur in the P-wave morphology between sinus rhythm (P) and tachycardia (P'), which correspond to slight changes in the atrial activation sequence seen on the intracardiac recordings. The observed AH interval makes AV node reentry and AV node reentry very unlikely, since these are almost always associated with obvious AH prolongation.

Case Study

- 74 year old female with a long standing history of palpitations since 1999
- More frequent over the last one year
- In the past, episodes were resolved with Valsalva but now they are not terminated with Valsalva
- Labs, Echo normal

Normal ECG

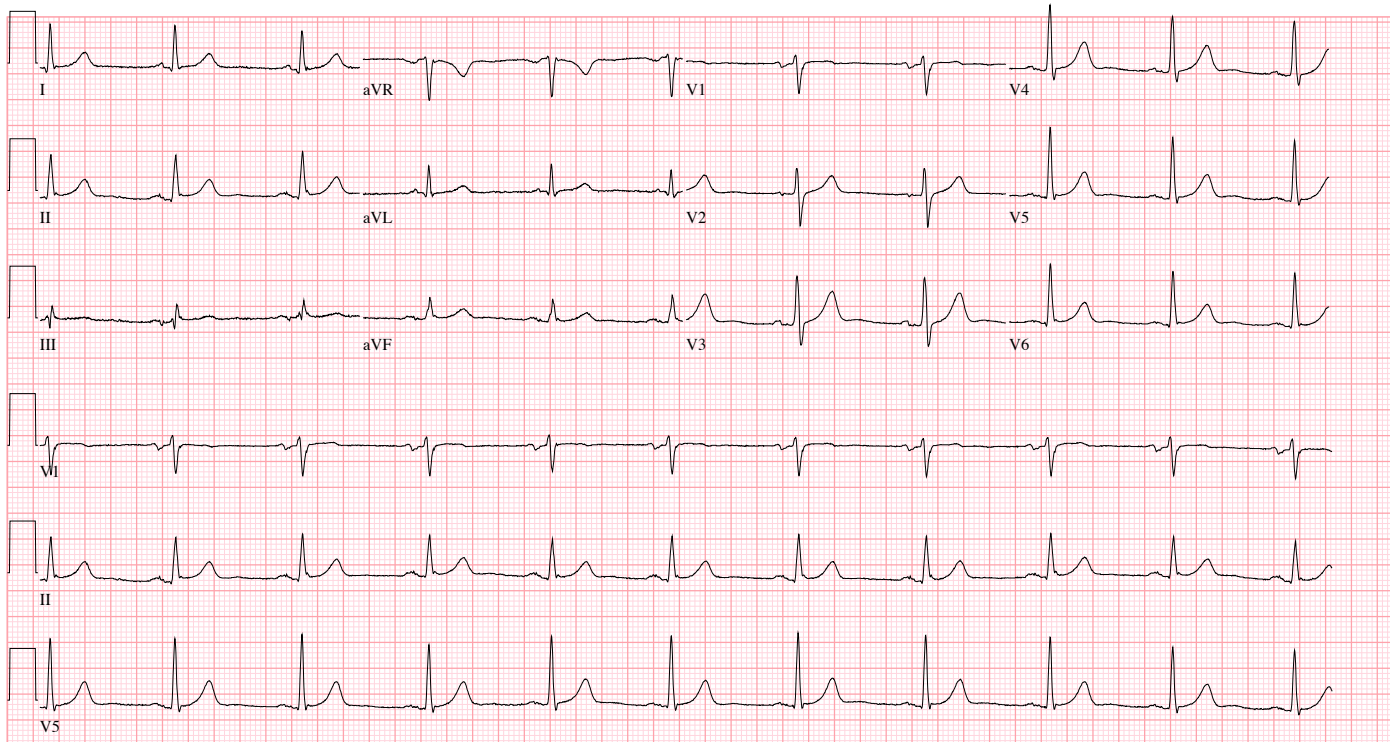
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Baseline

