CARDIAC ARRHYTHMIAS

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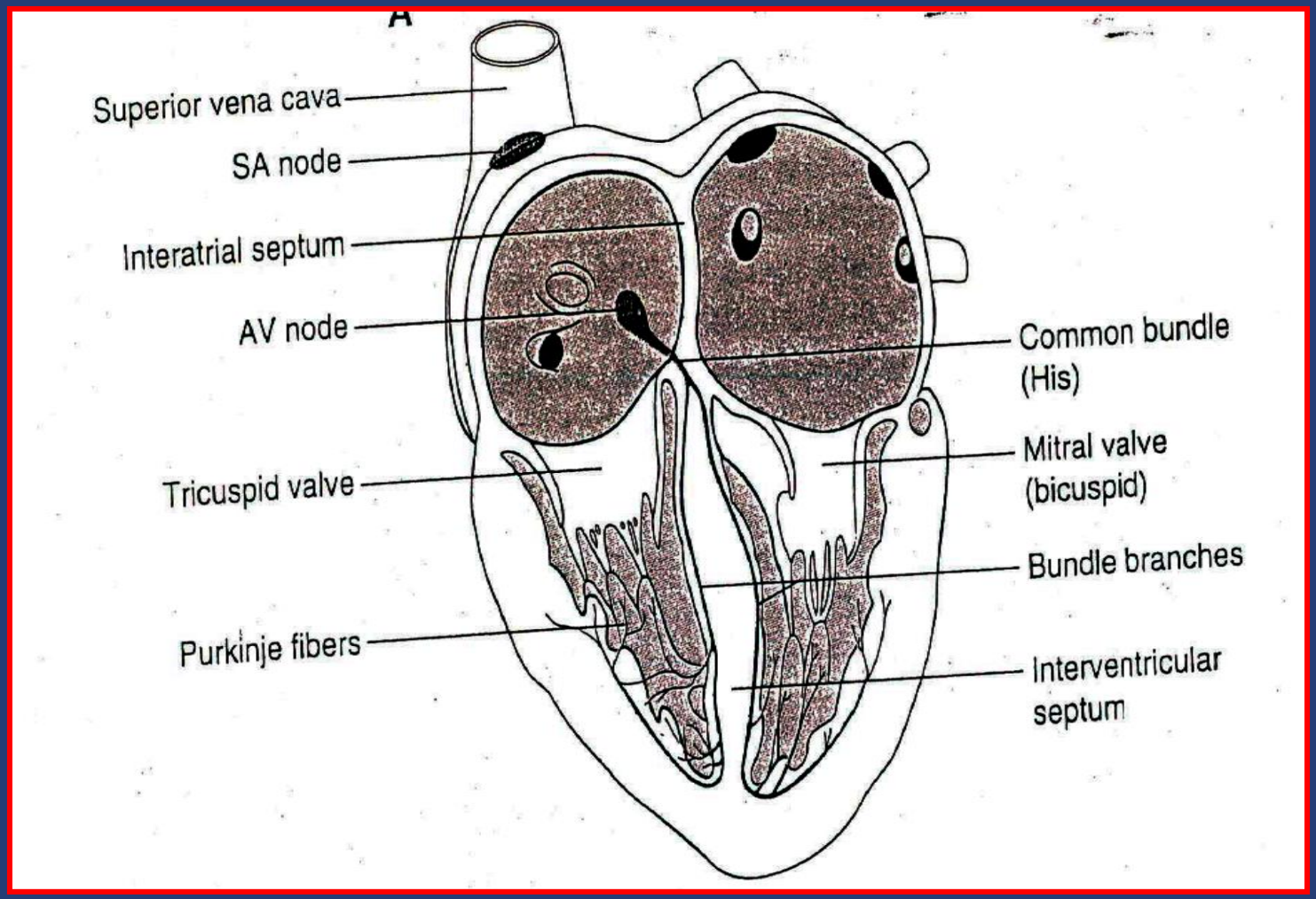
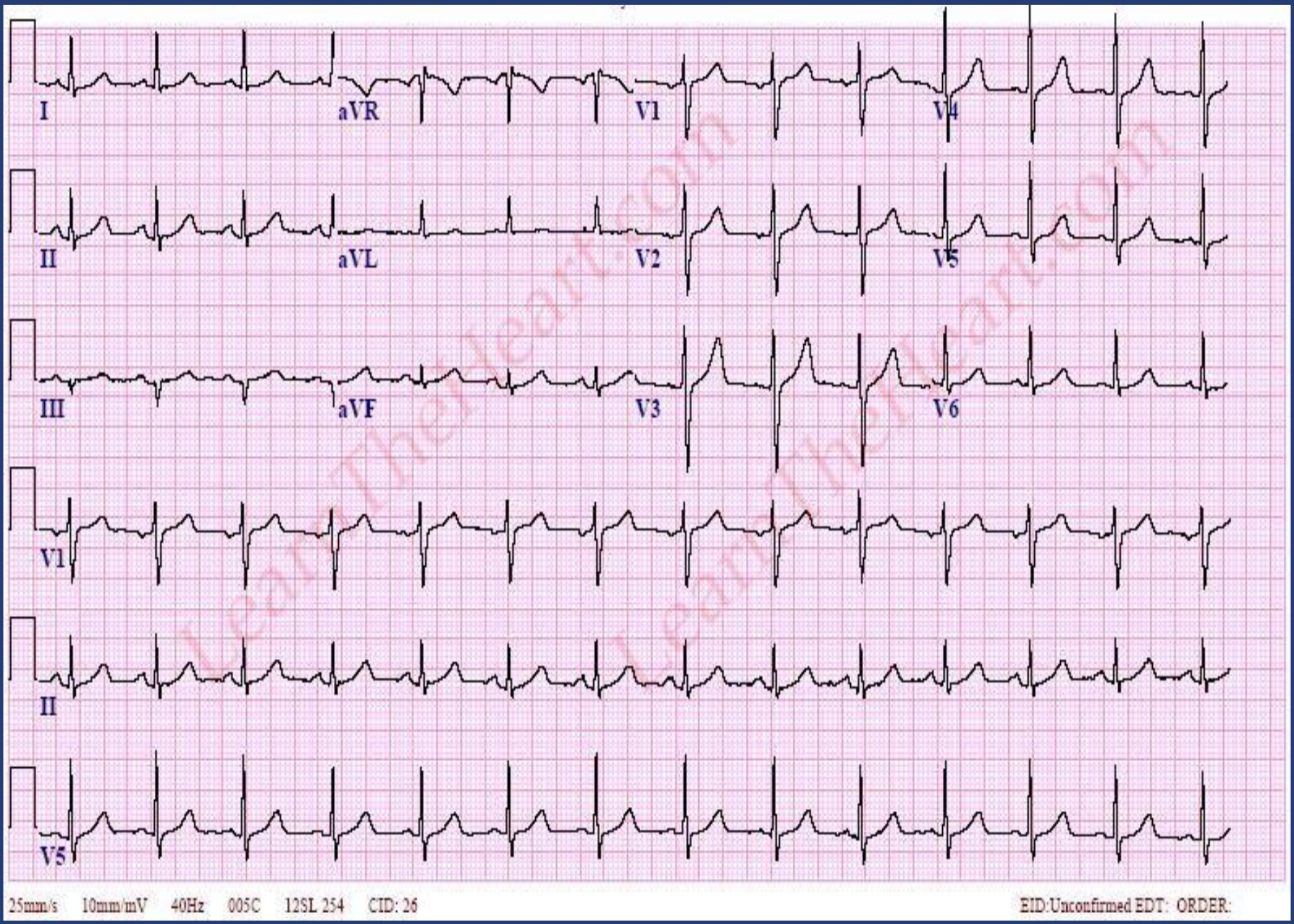
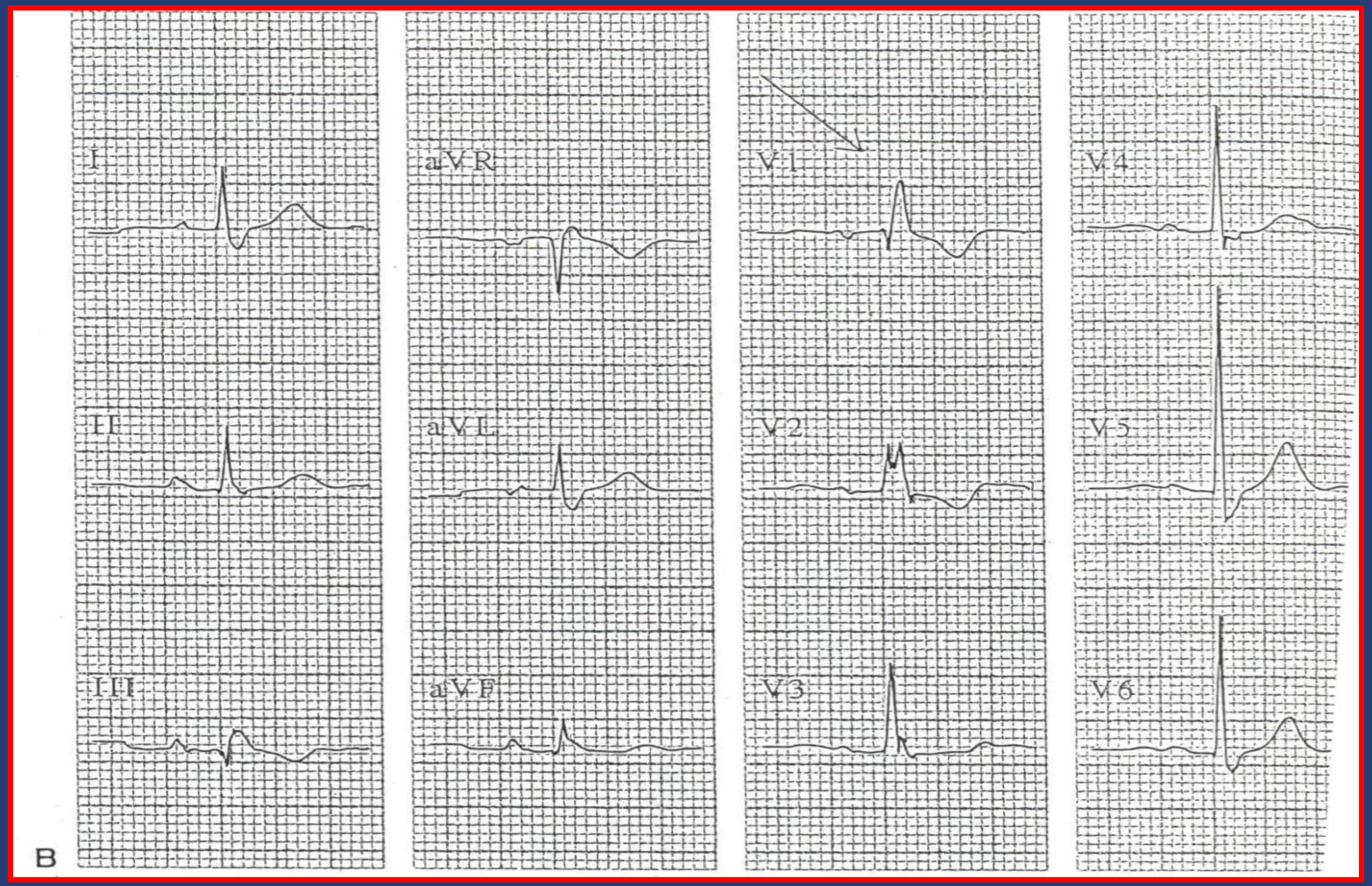
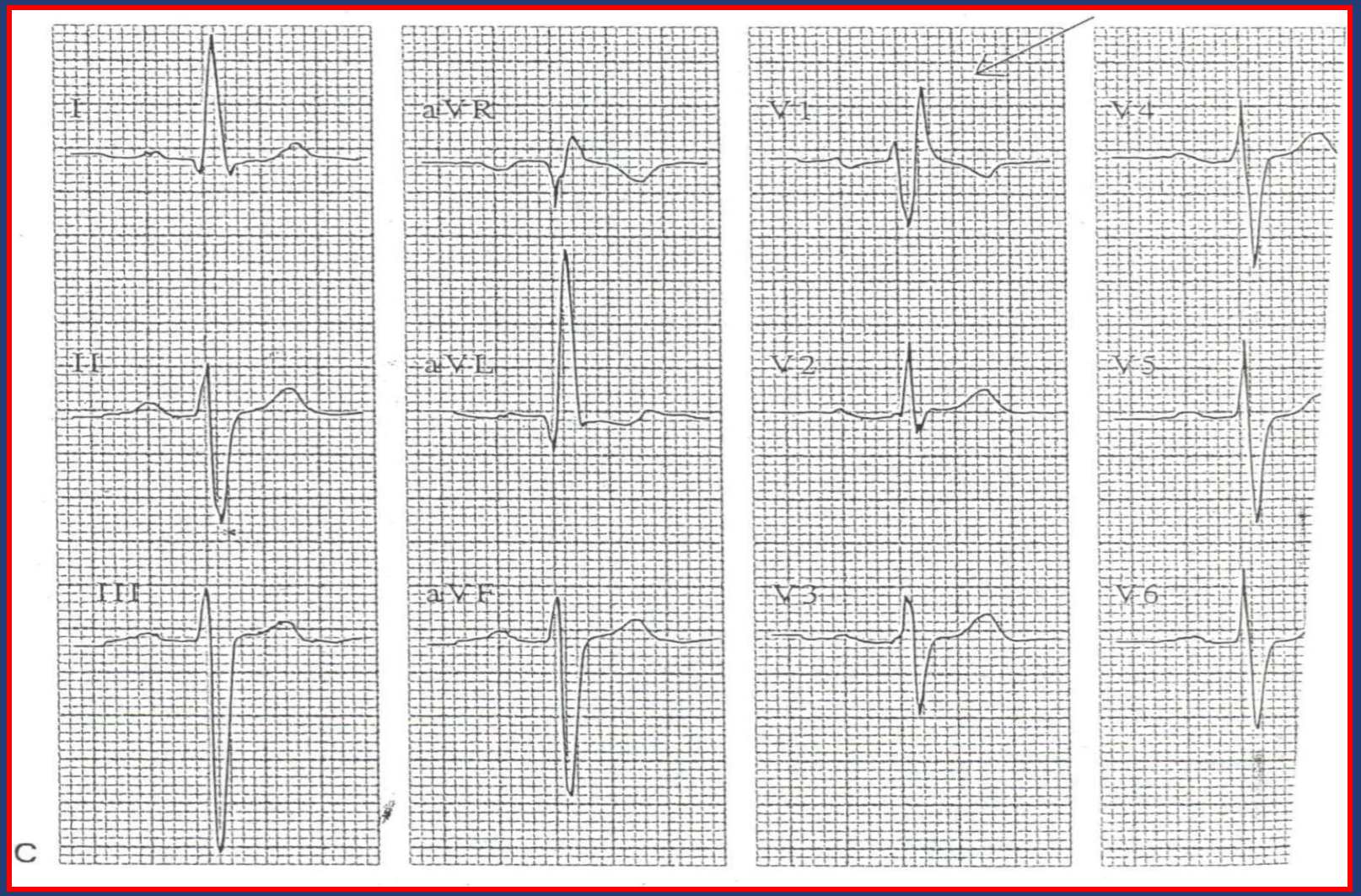
Anatomy of Conduction System



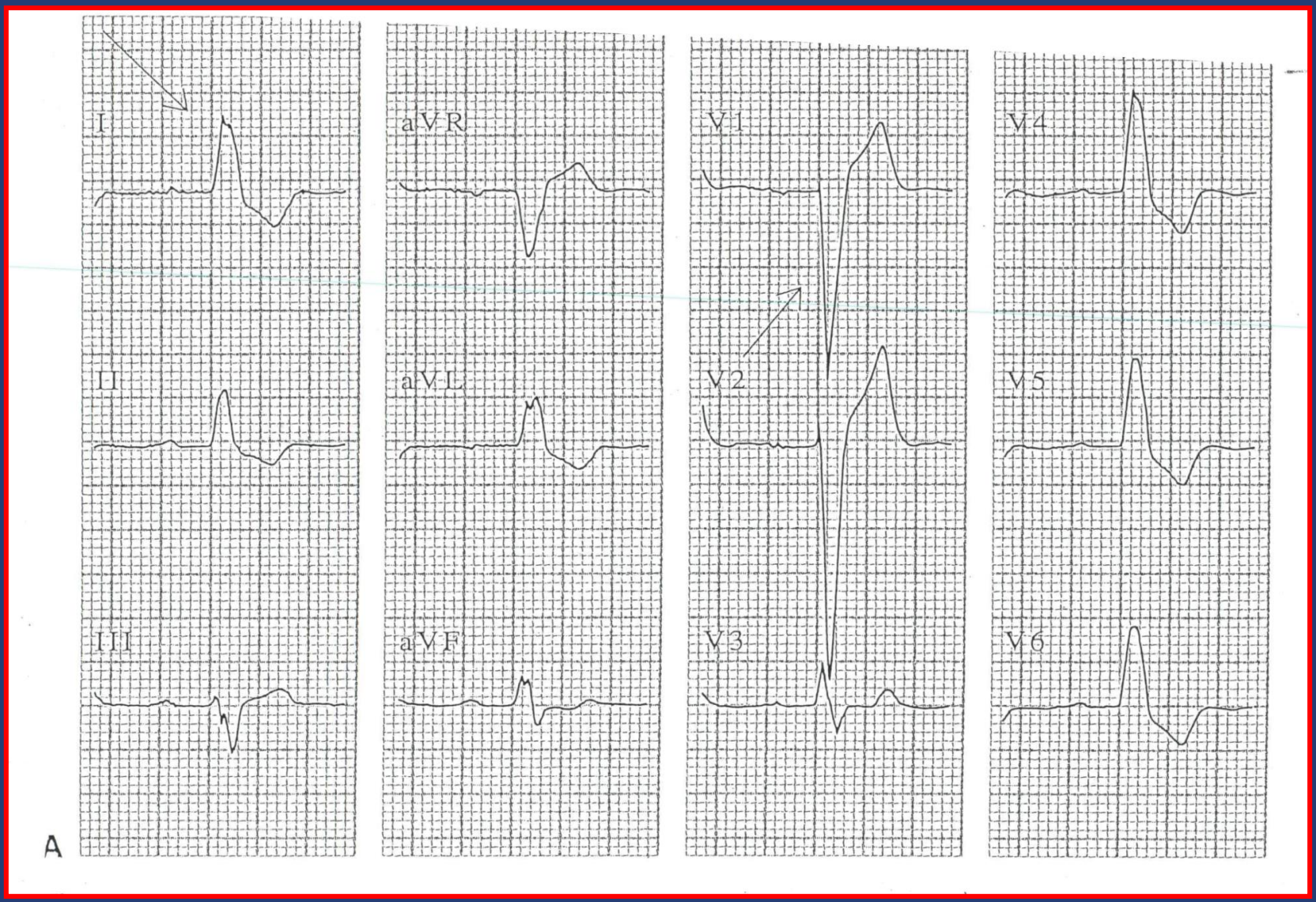

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5
25mm/s 10mm/mV 40Hz 005C 12SL 254 CID: 26
EID:Unconfirmed EDT: ORDER:



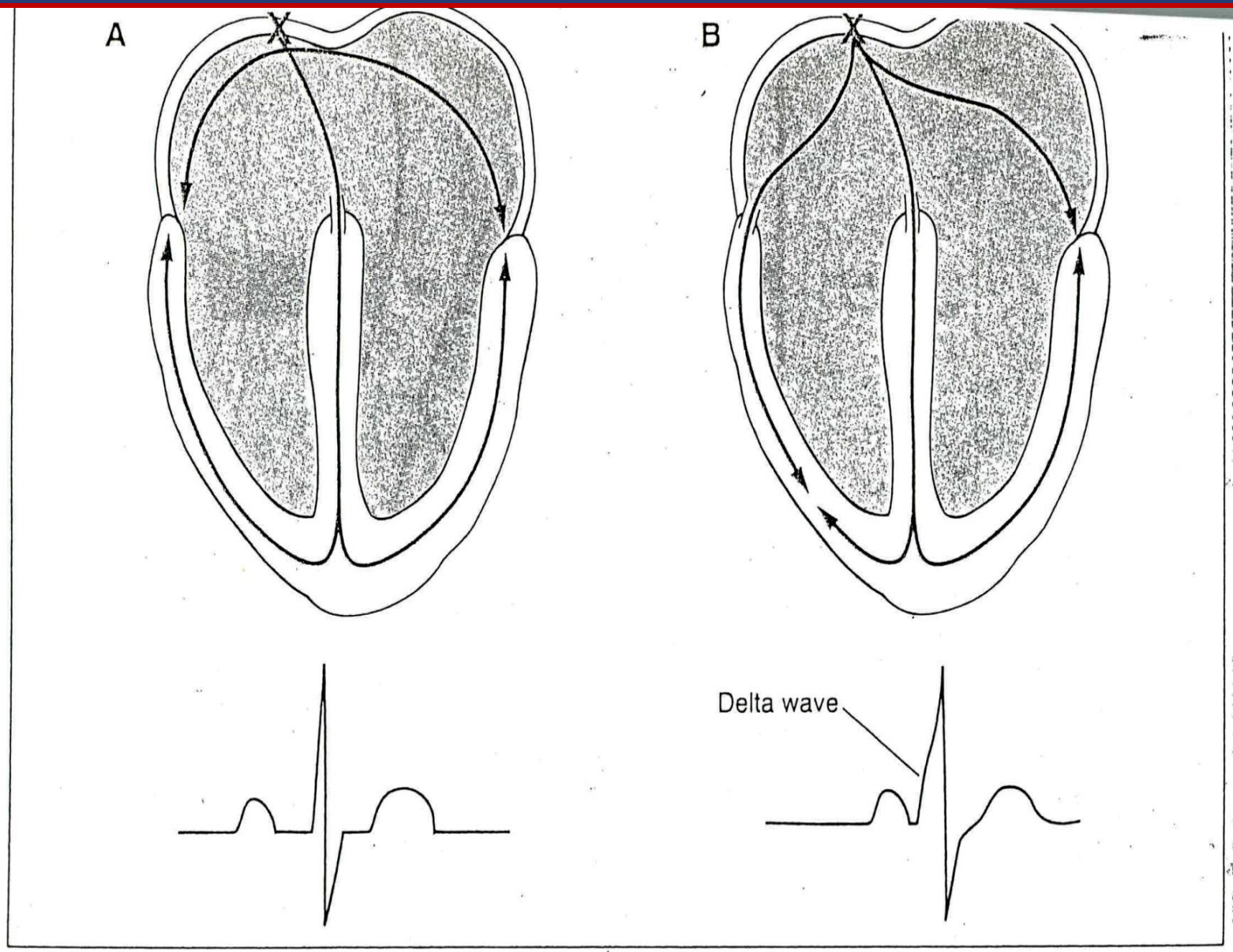
Right Bundle Branch Block

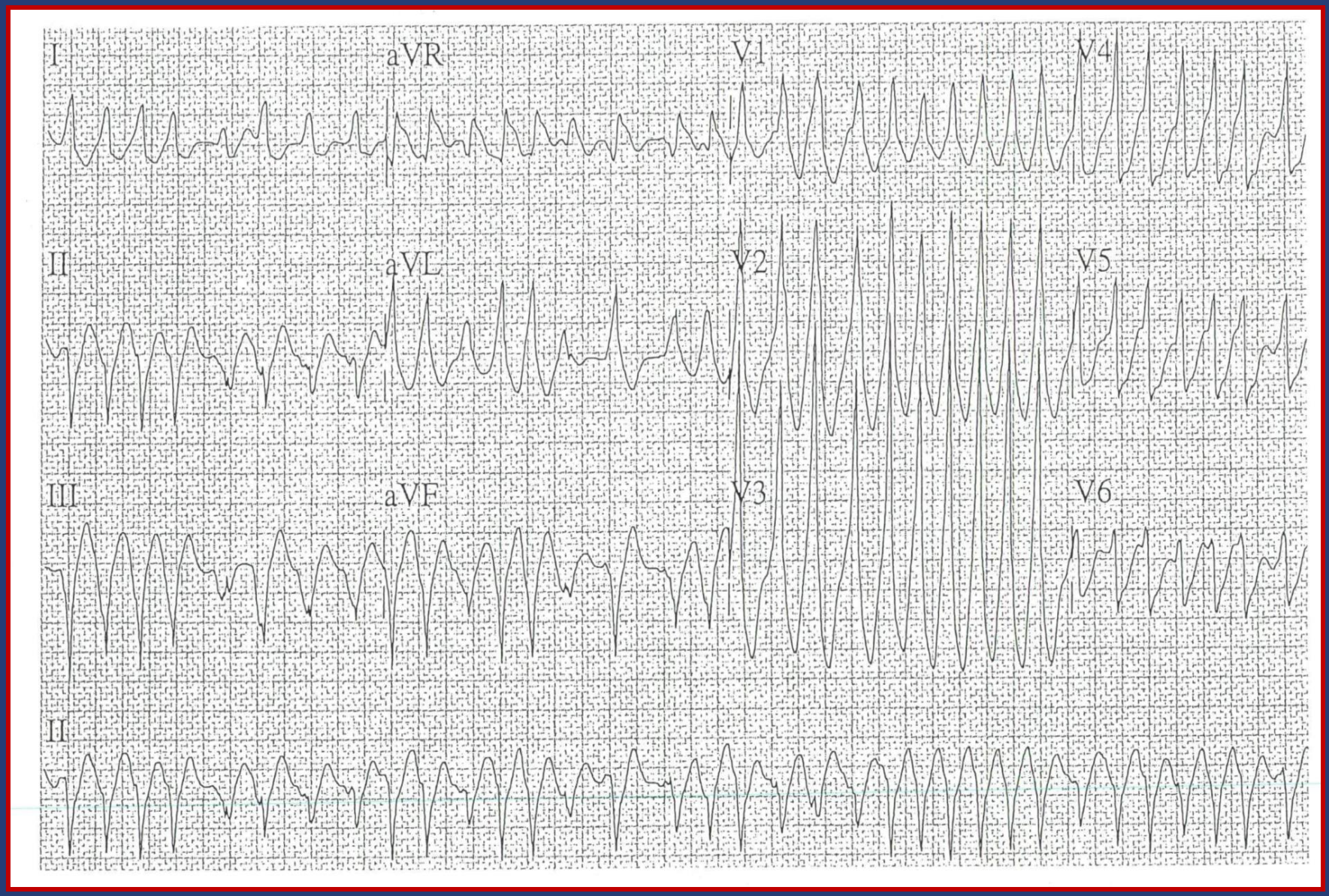


RBBB with LAHB

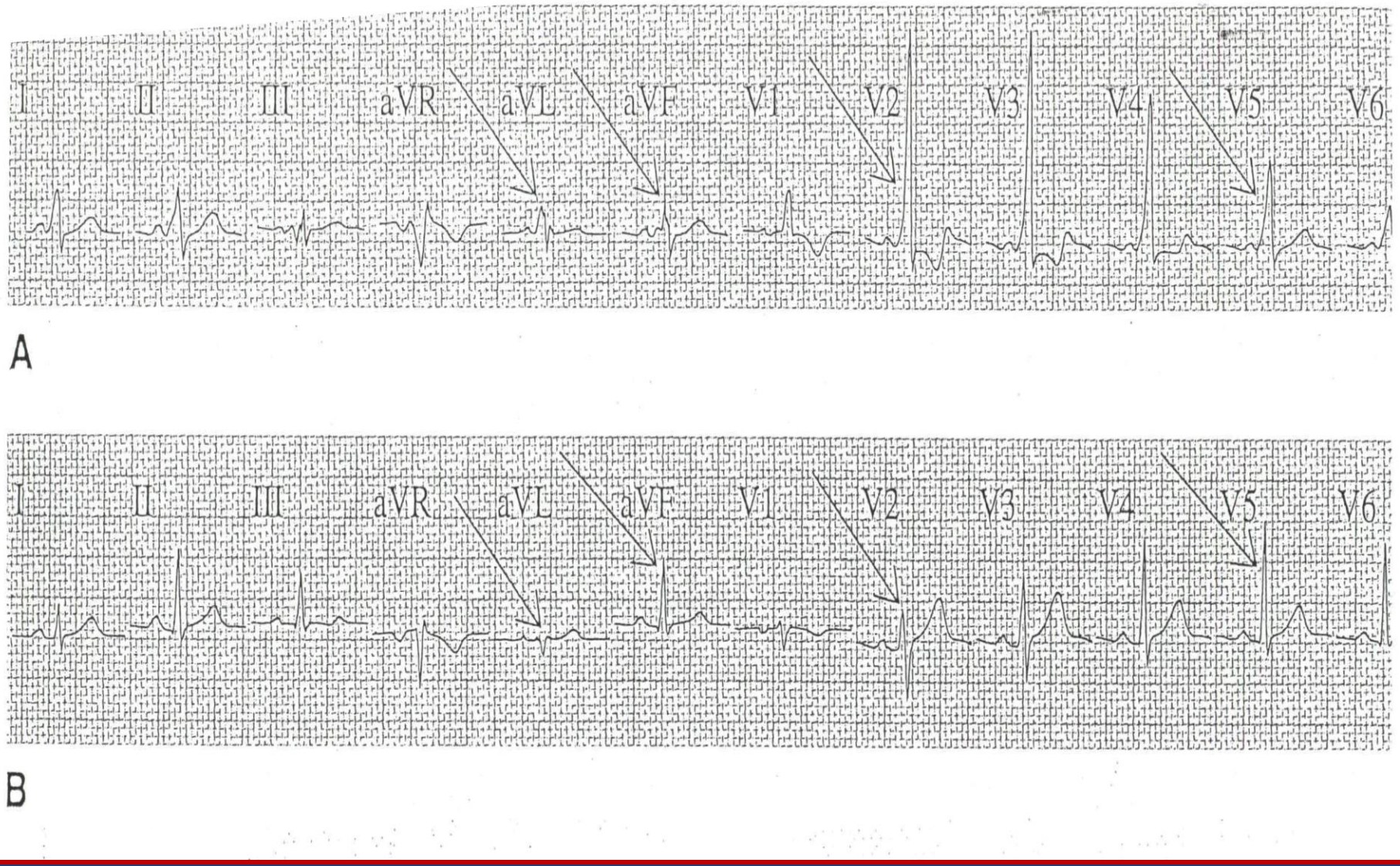


Left Bundle Branch Block

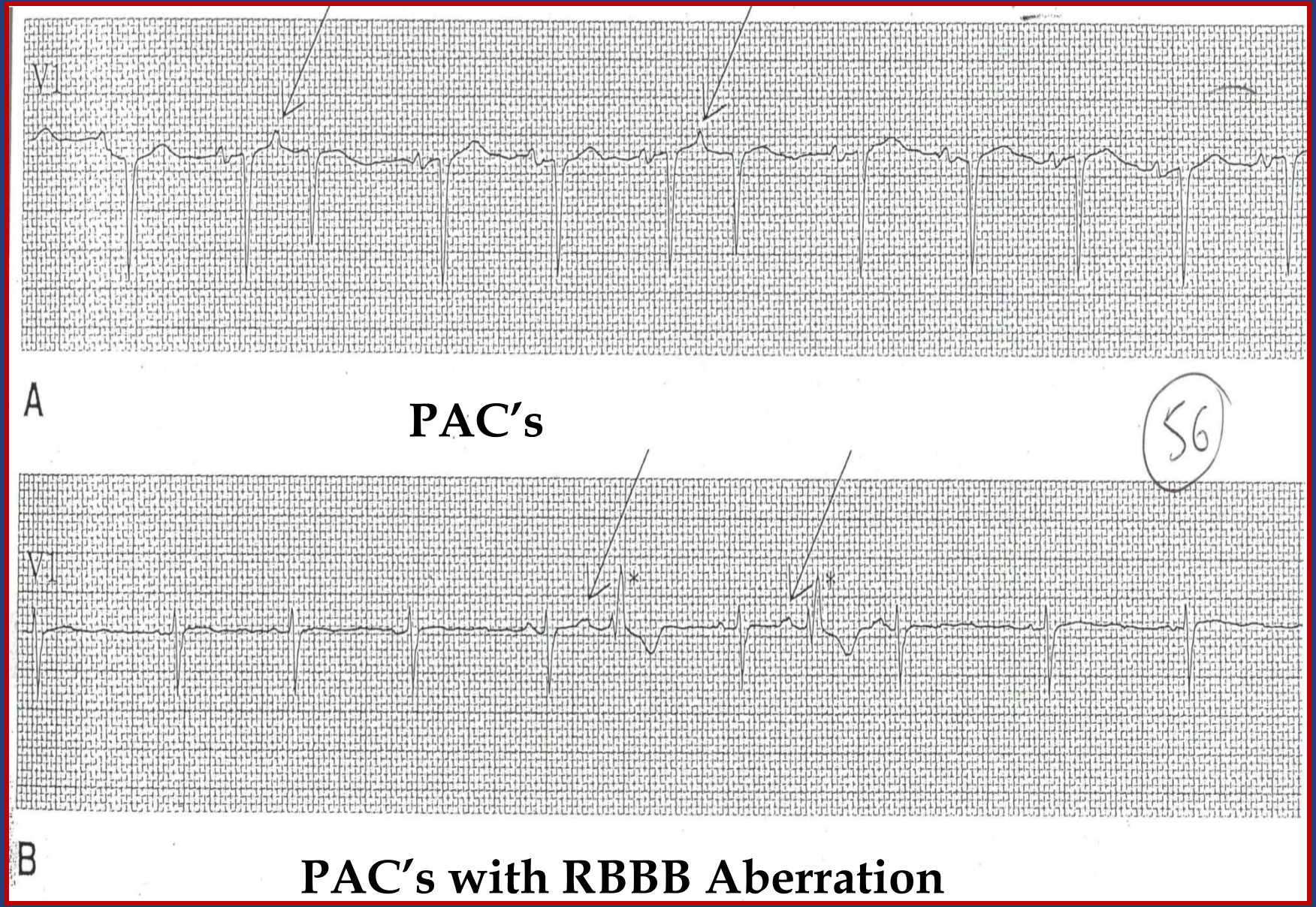

A
B
Delta wave

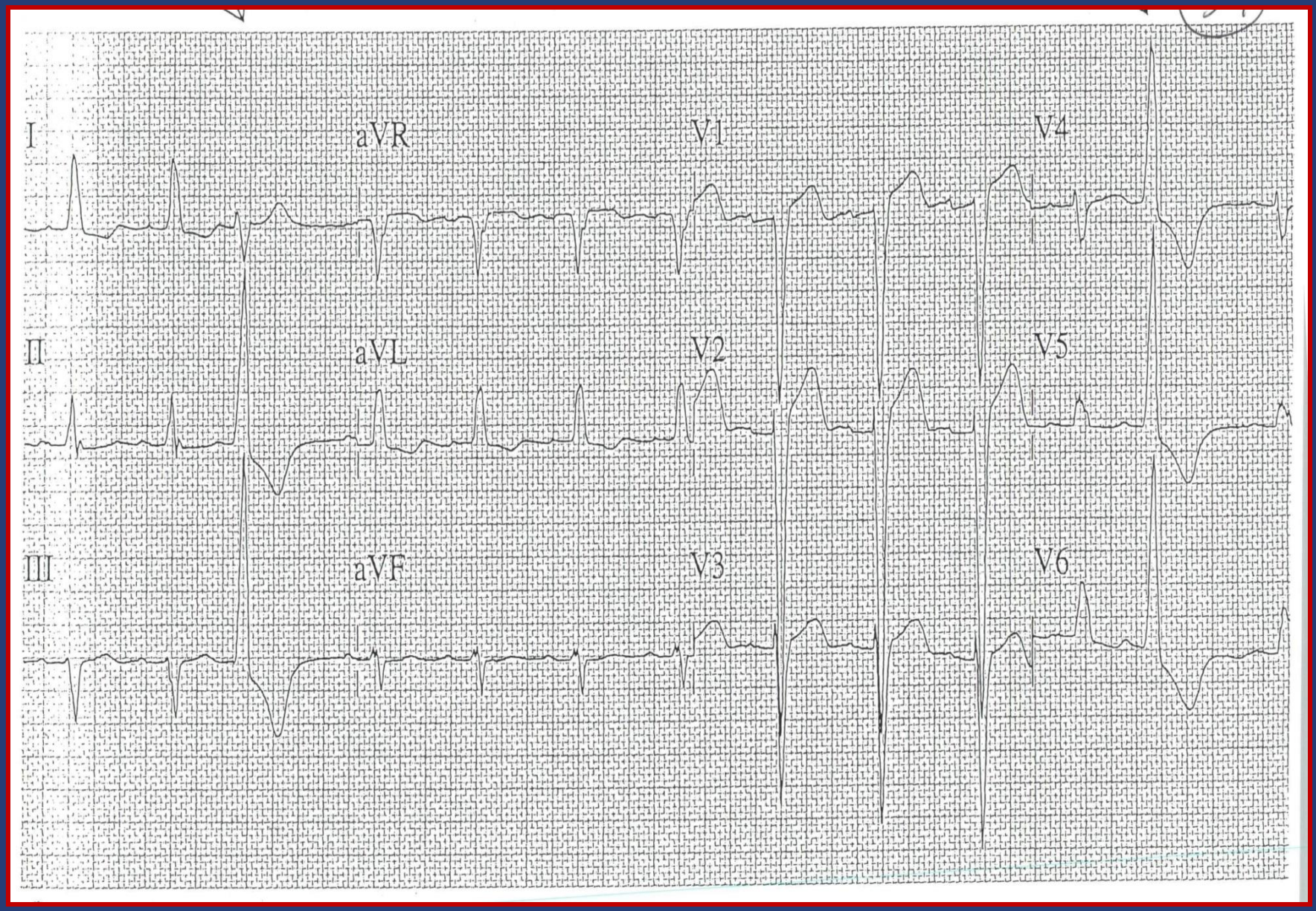


Atrial Fibrillation in a Patient with WPW Syndrome

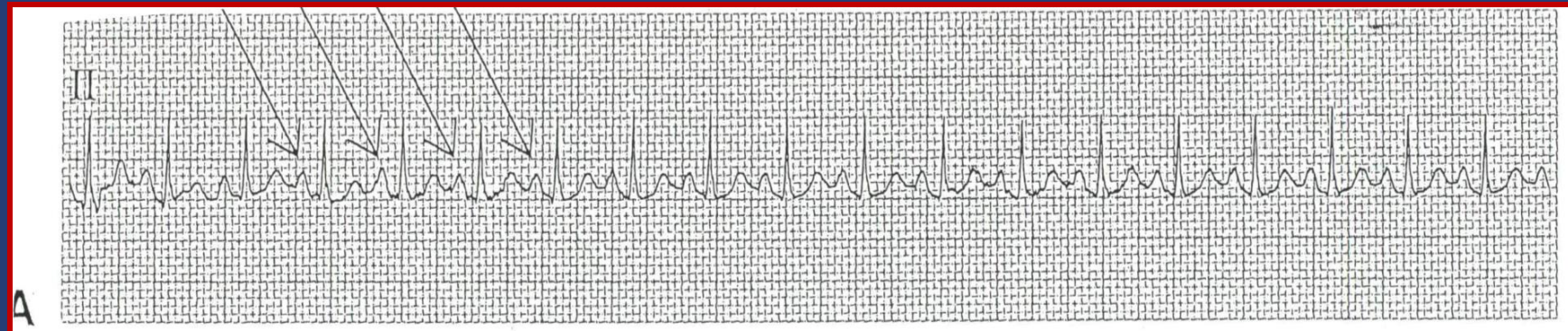


WPW EKG (Top) and Post RF Ablation (Bottom)

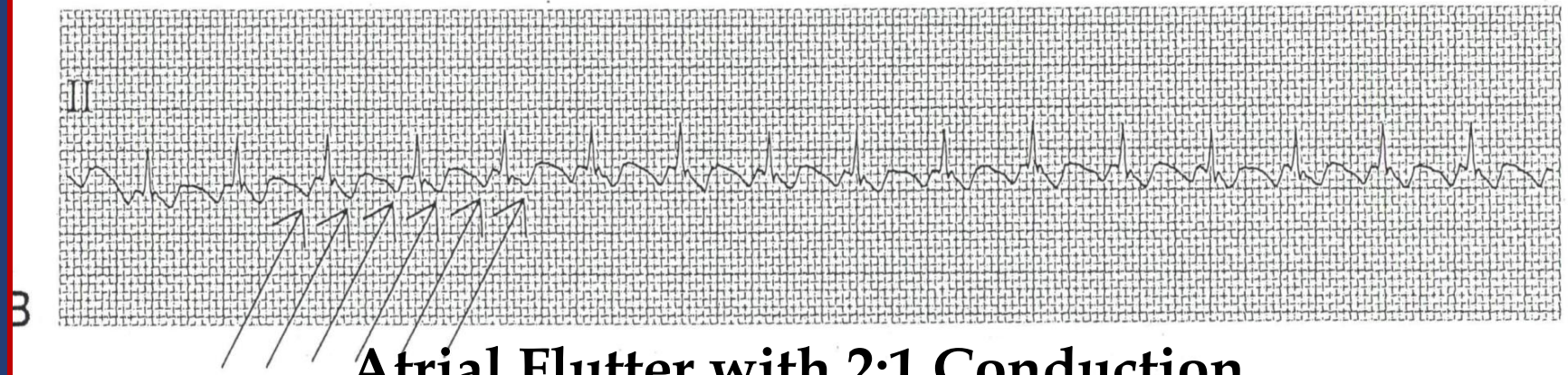

V1
A
PAC's
56
V1
*
*
B
PAC's with RBBB Aberration



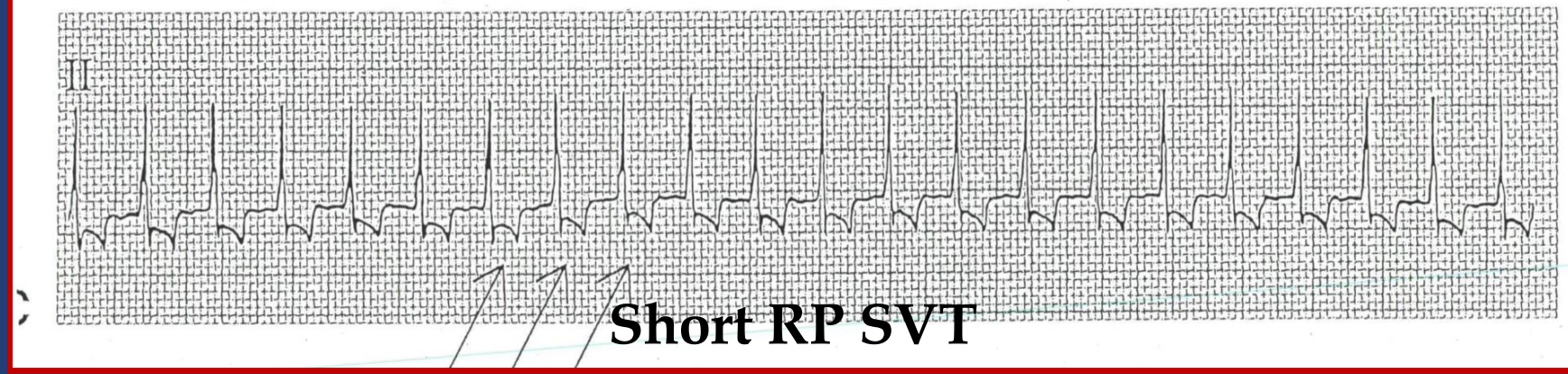
PVC's



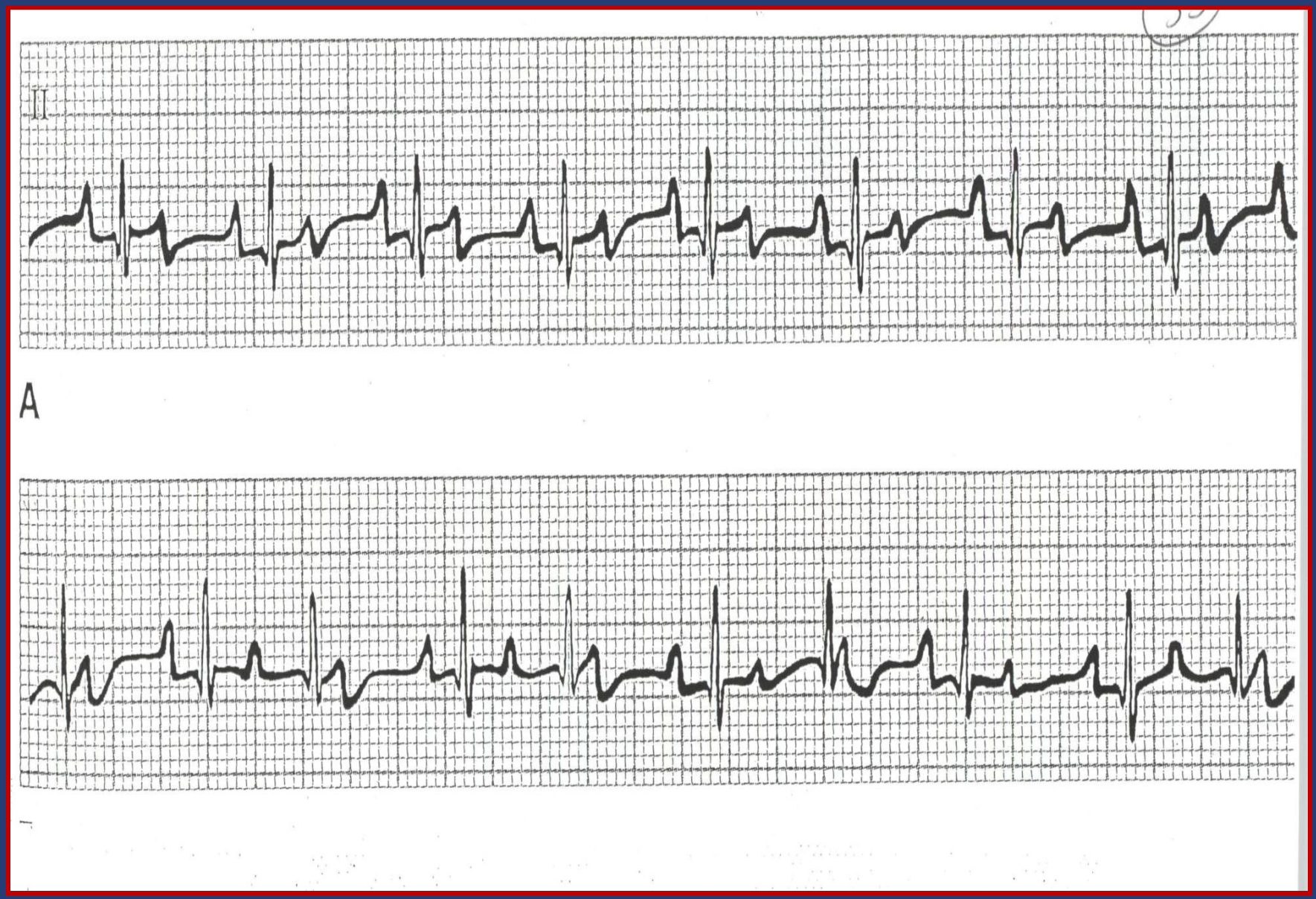
Sinus Tachycardia



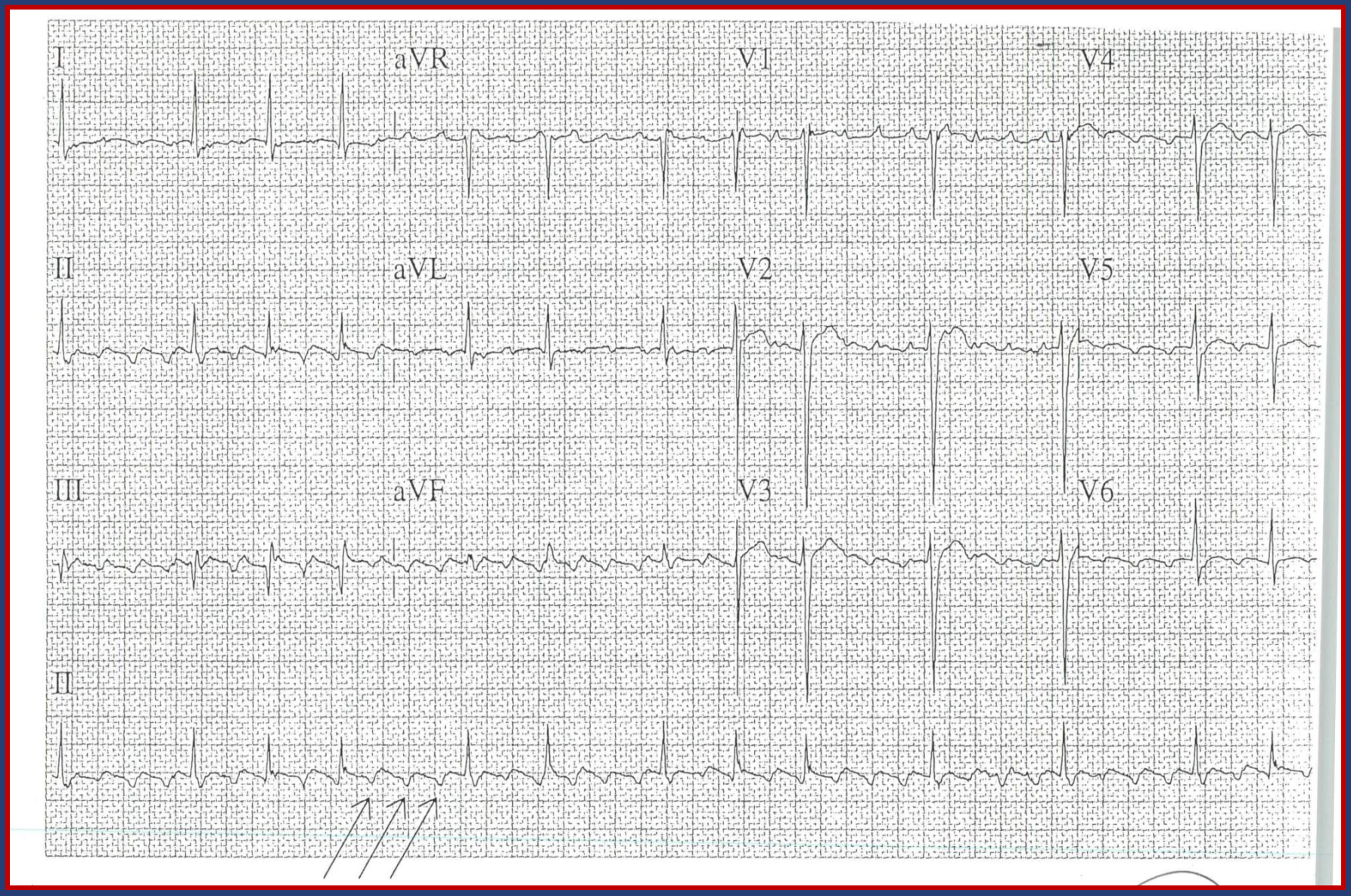
Atrial Flutter with 2:1 Conduction



Short RP SVT

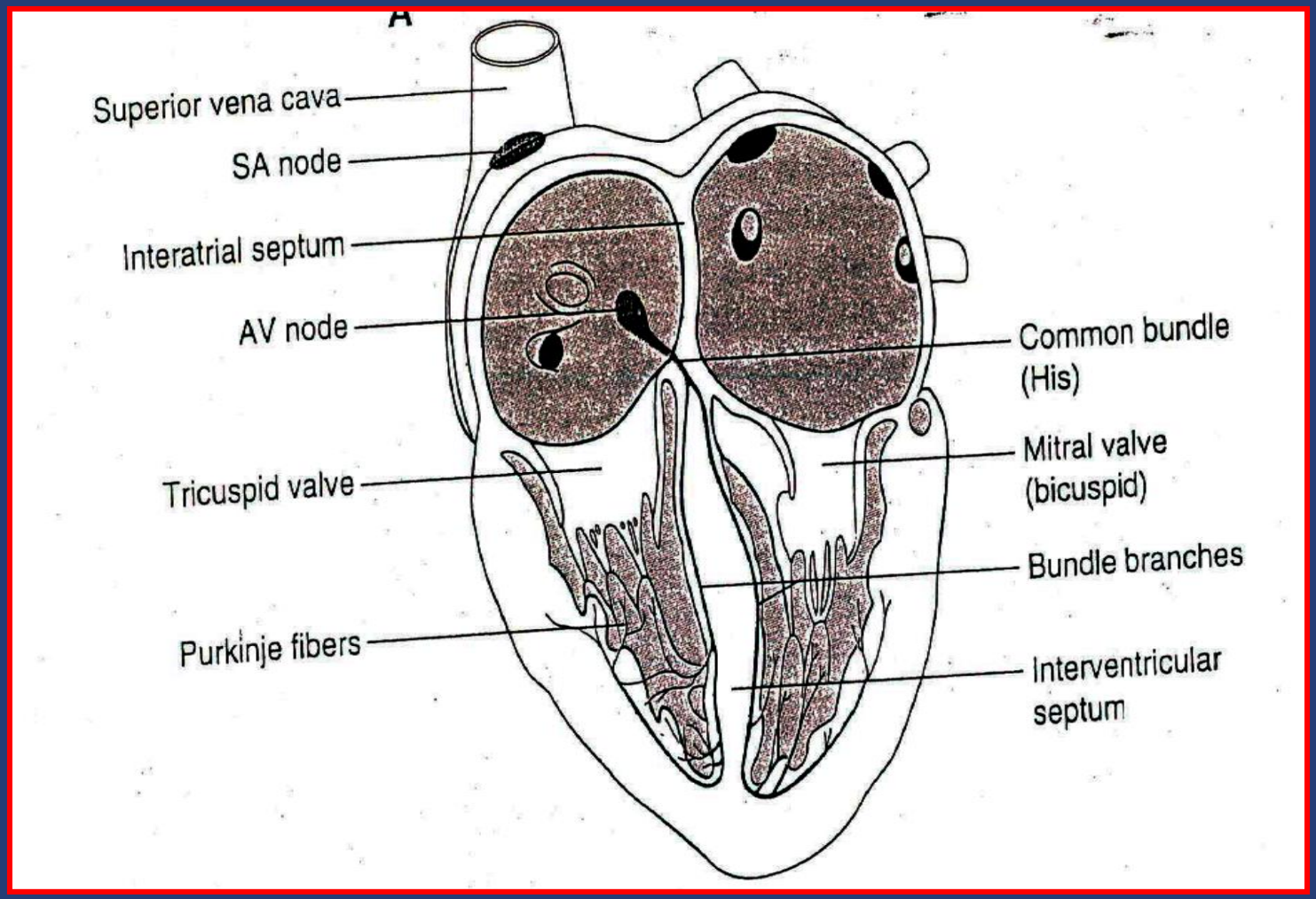


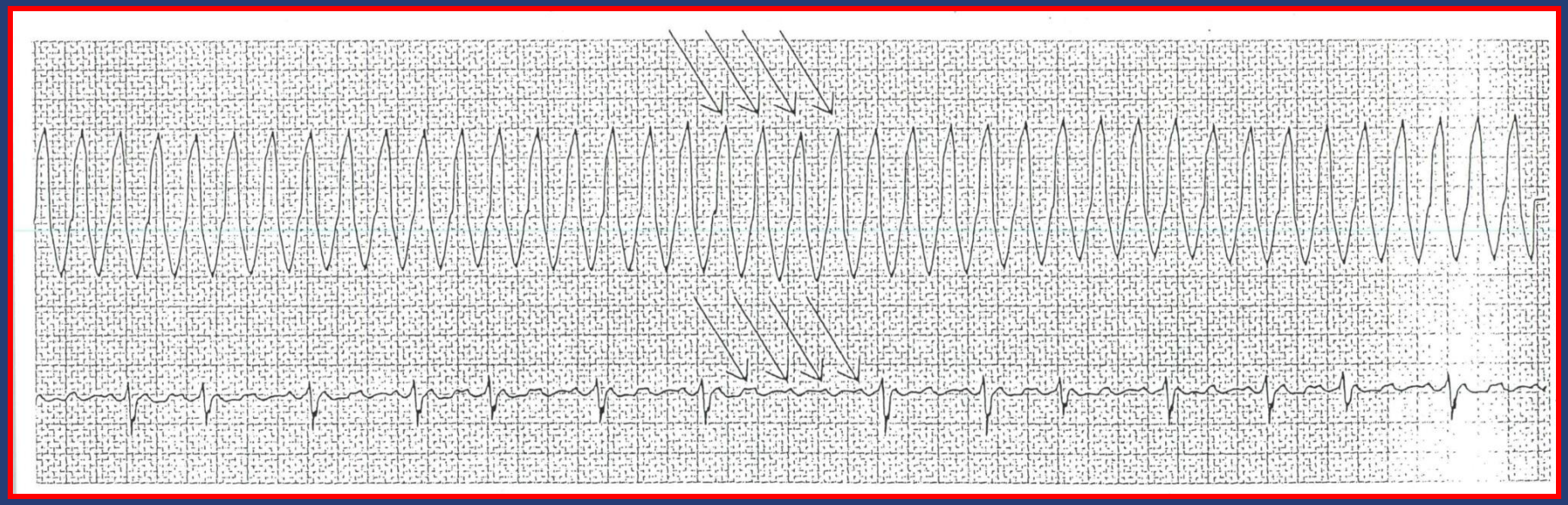
Multifocal Atrial Tachycardia with AV Block



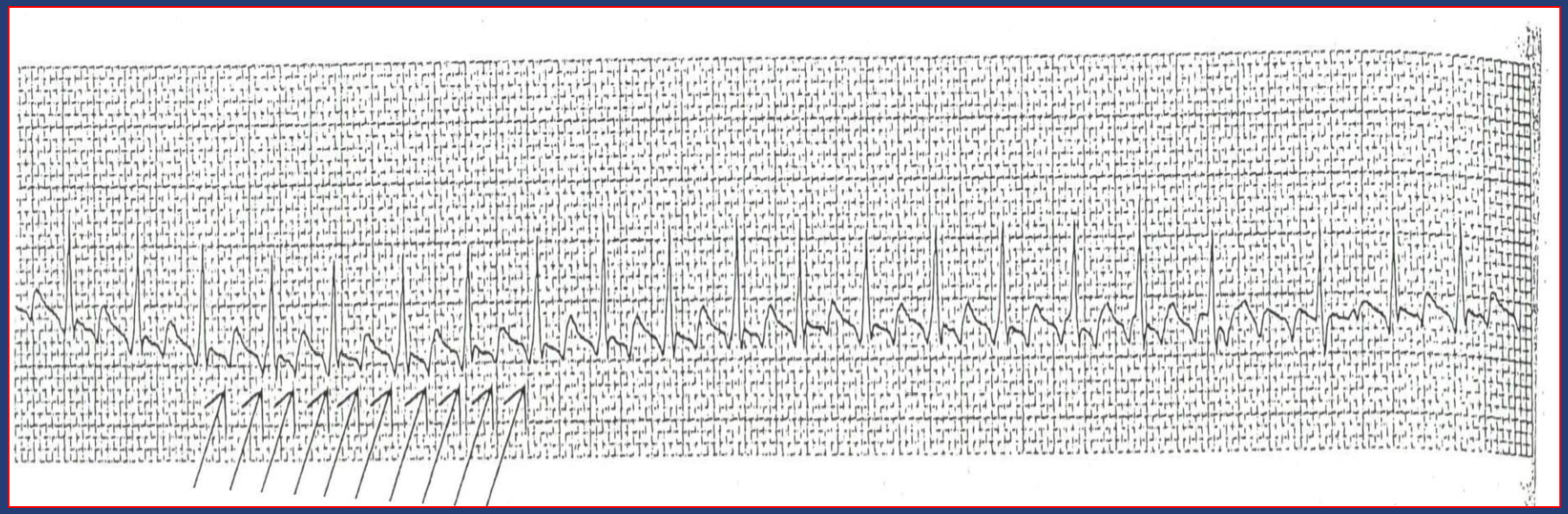
Typical Counterclockwise Atrial Flutter

Anatomy of Conduction System

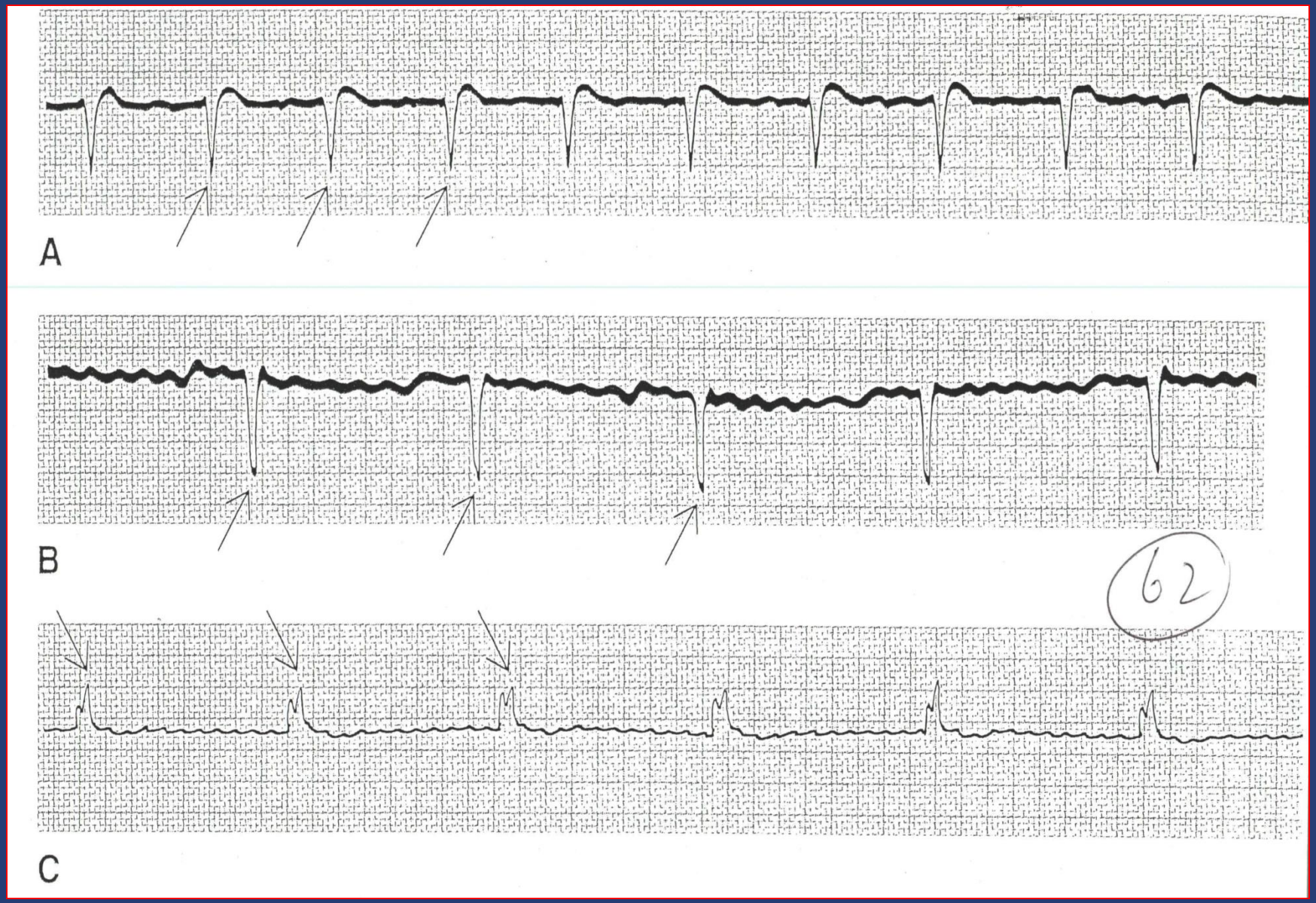




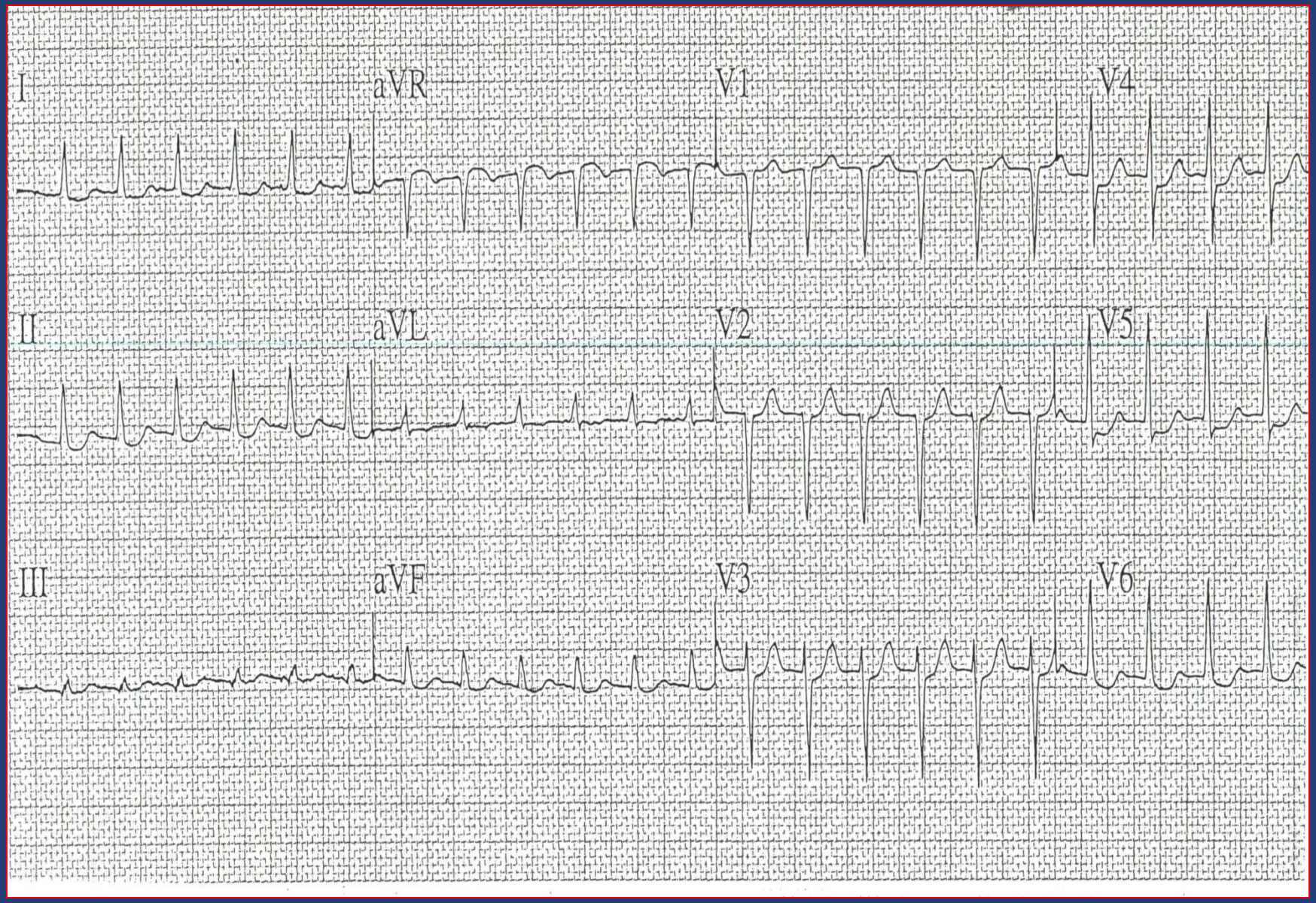
Aberrantly Conducted Atrial Flutter with 1:1 Conduction



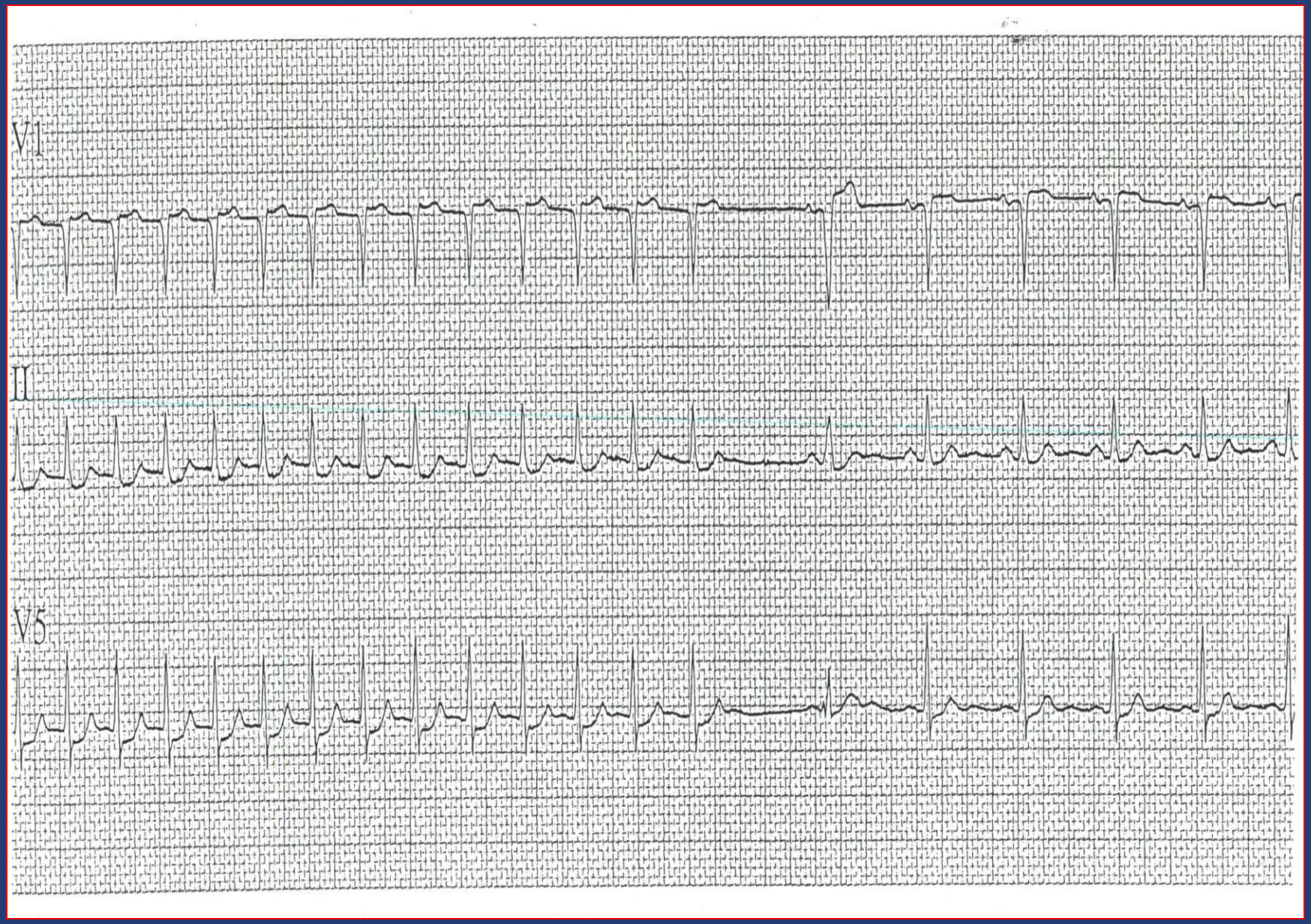
Atrial Flutter



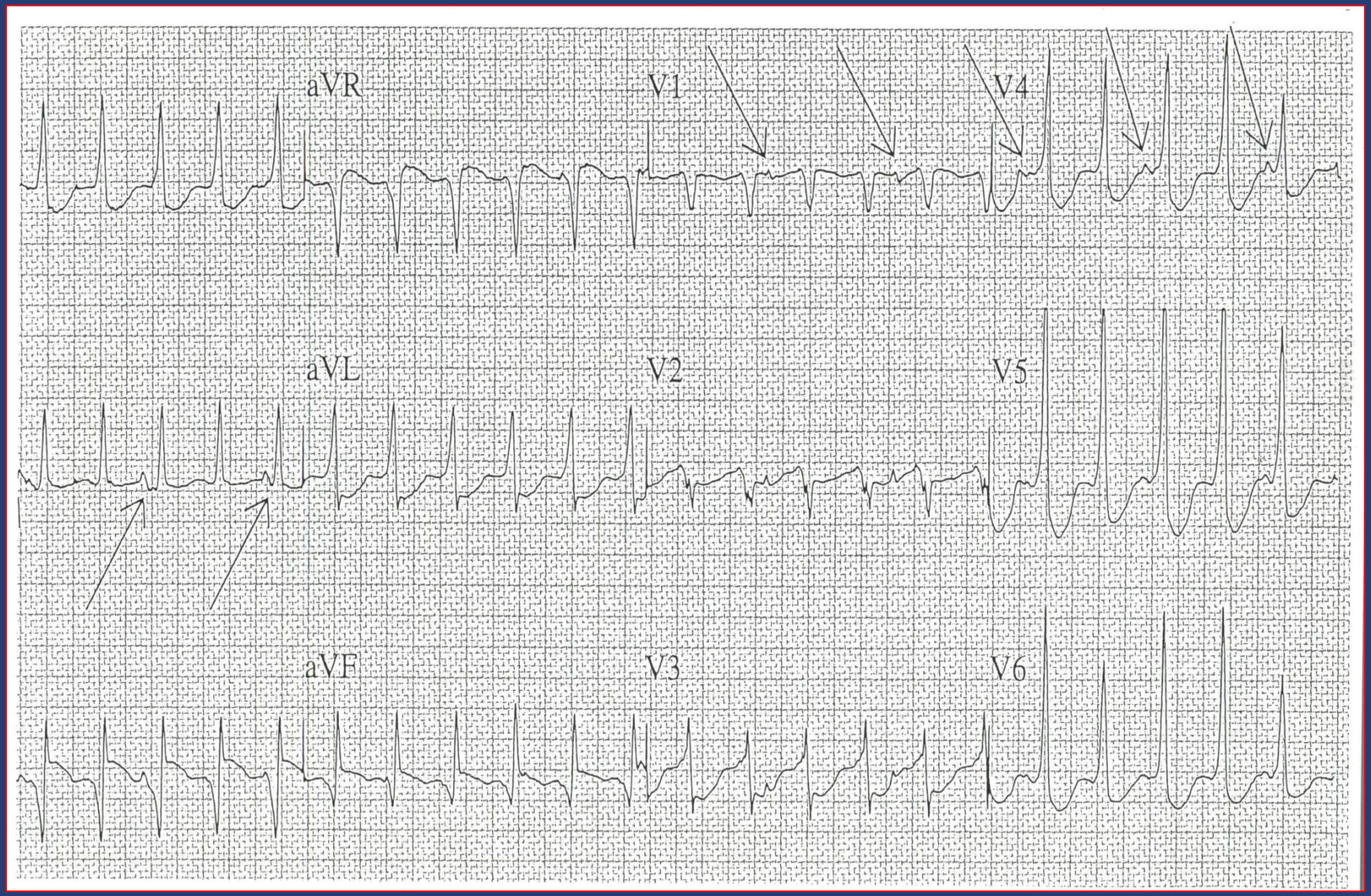
Atrial Fibrillation with Complete Heart Block and Escape Rhythm



SVT with no Discernable P–waves = AVNRT

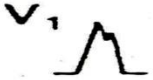


Same Patient after Termination with Adenosine



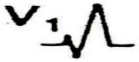
VT with AV Dissociation

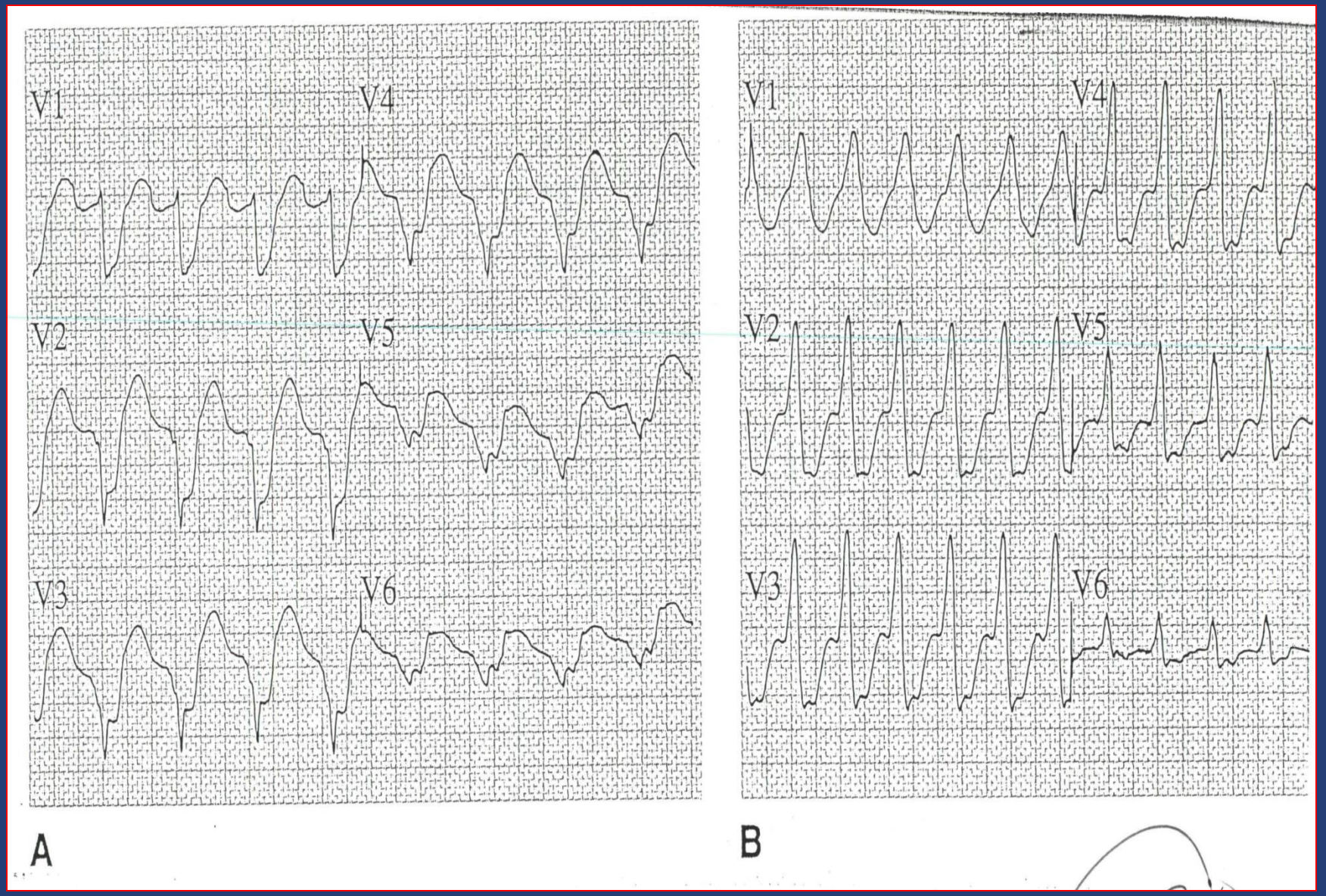
Table 17.2. QRS Contours Favoring Ventricular Tachycardia[a]

	Wellens[19, 20]	Gulamhusein[25]
	15/15 (100%)	84/86 (98%)
	7/7 (100%)	177/187 (95%)
	27/31 (87%)	189/190 (100%)
	17/17 (100%)	38/40 (94%)

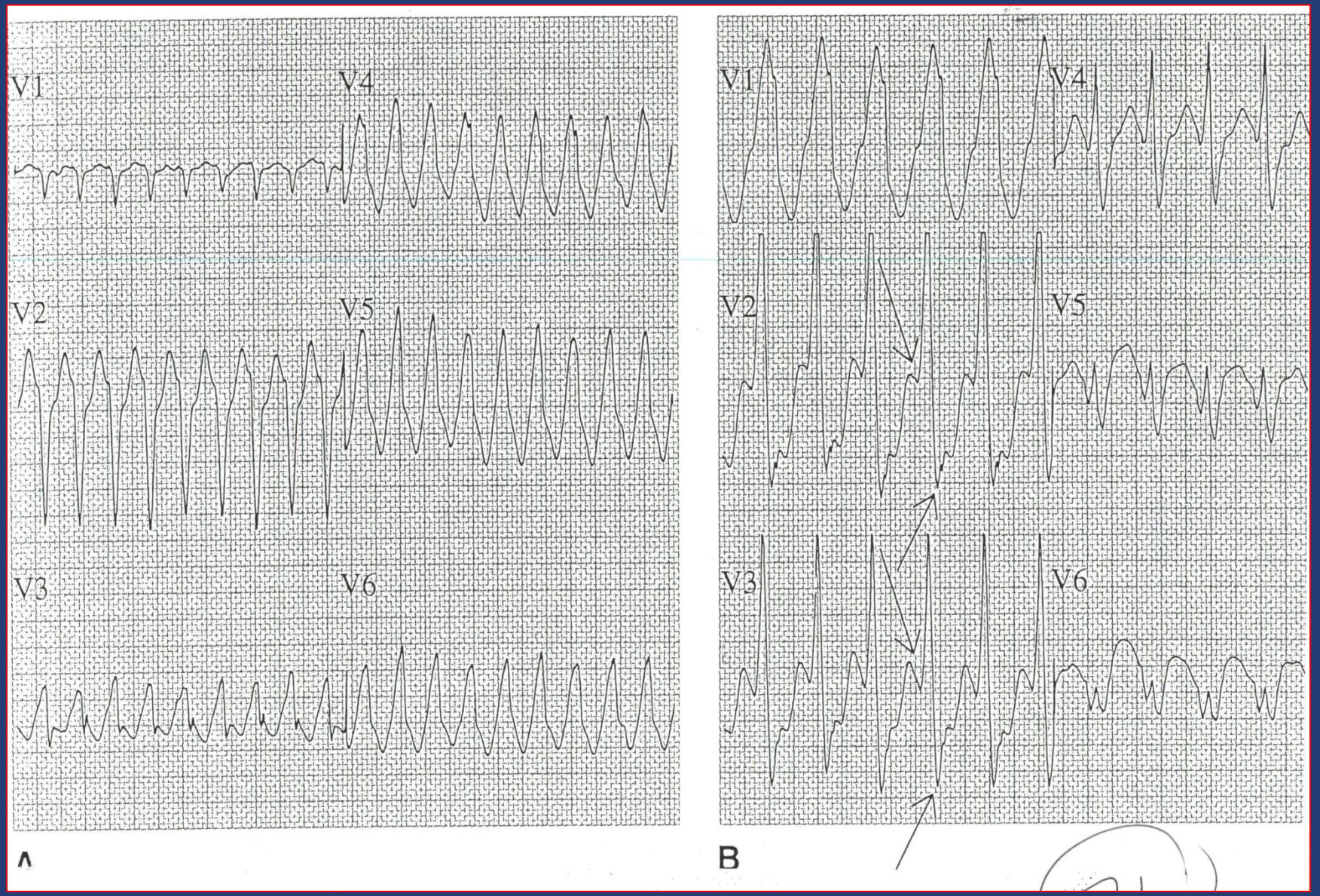
[a] In each pair of numbers, denominator is number of times contour was encountered; numerator is number of times it was ventricular in origin.

Table 17.3. QRS Contours Favoring Ventricular Aberration

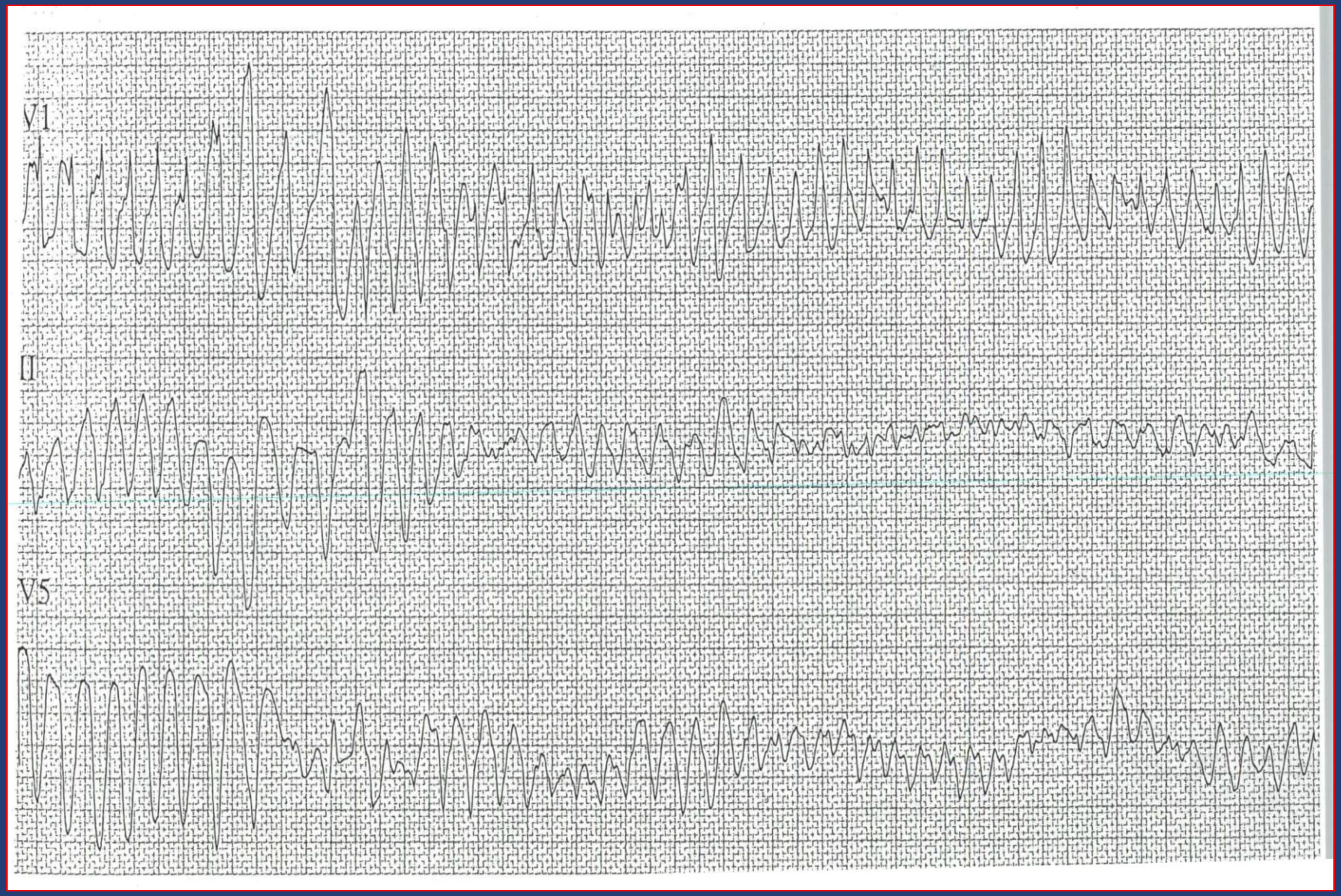
	Wellens[19, 20]	Gulamhusein[25]
	38/41 (93%)	55/55 (100%)
	44/47 (94%)	27/27 (100%)



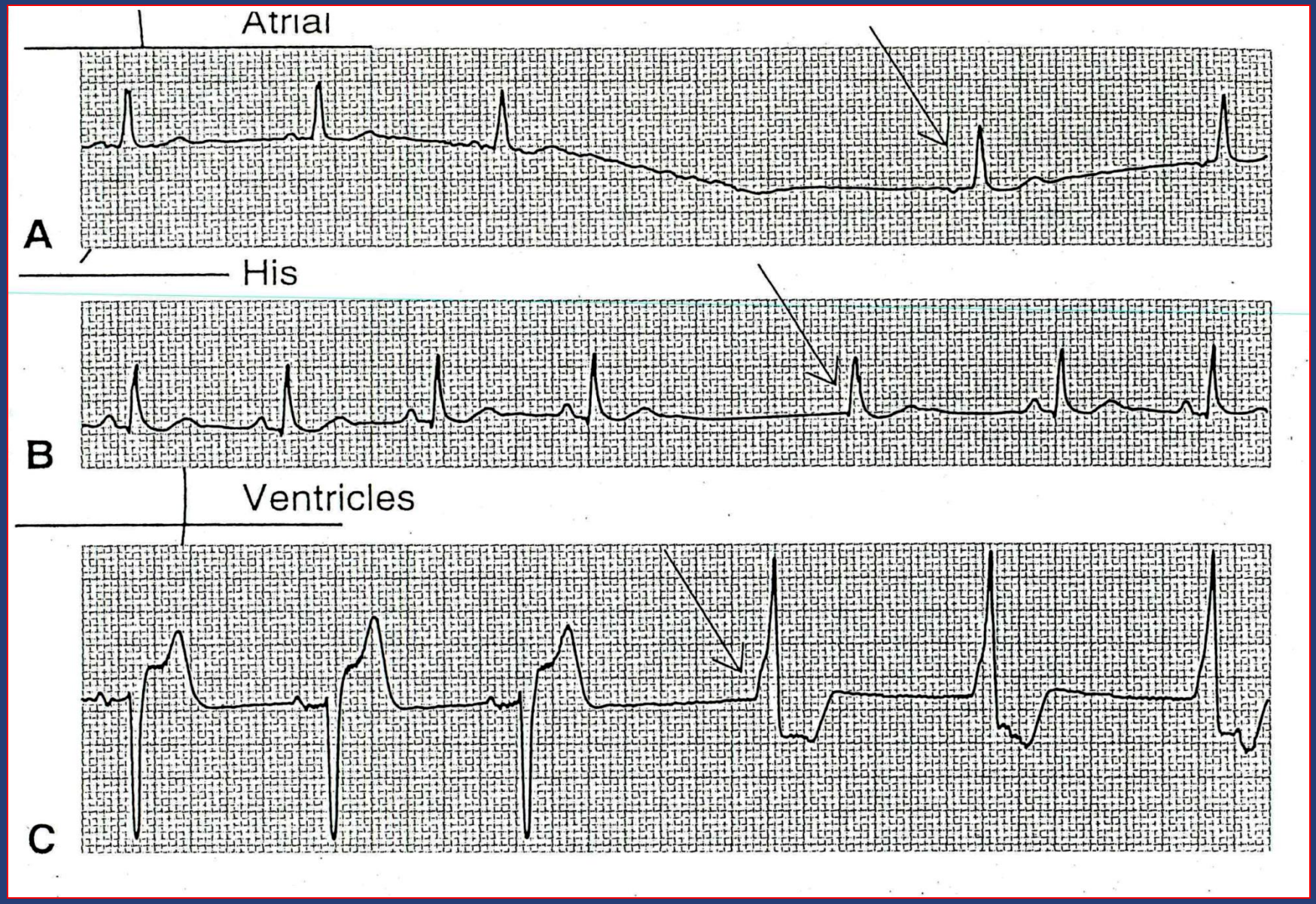
VT with Precordial Concordance (negative / positive)



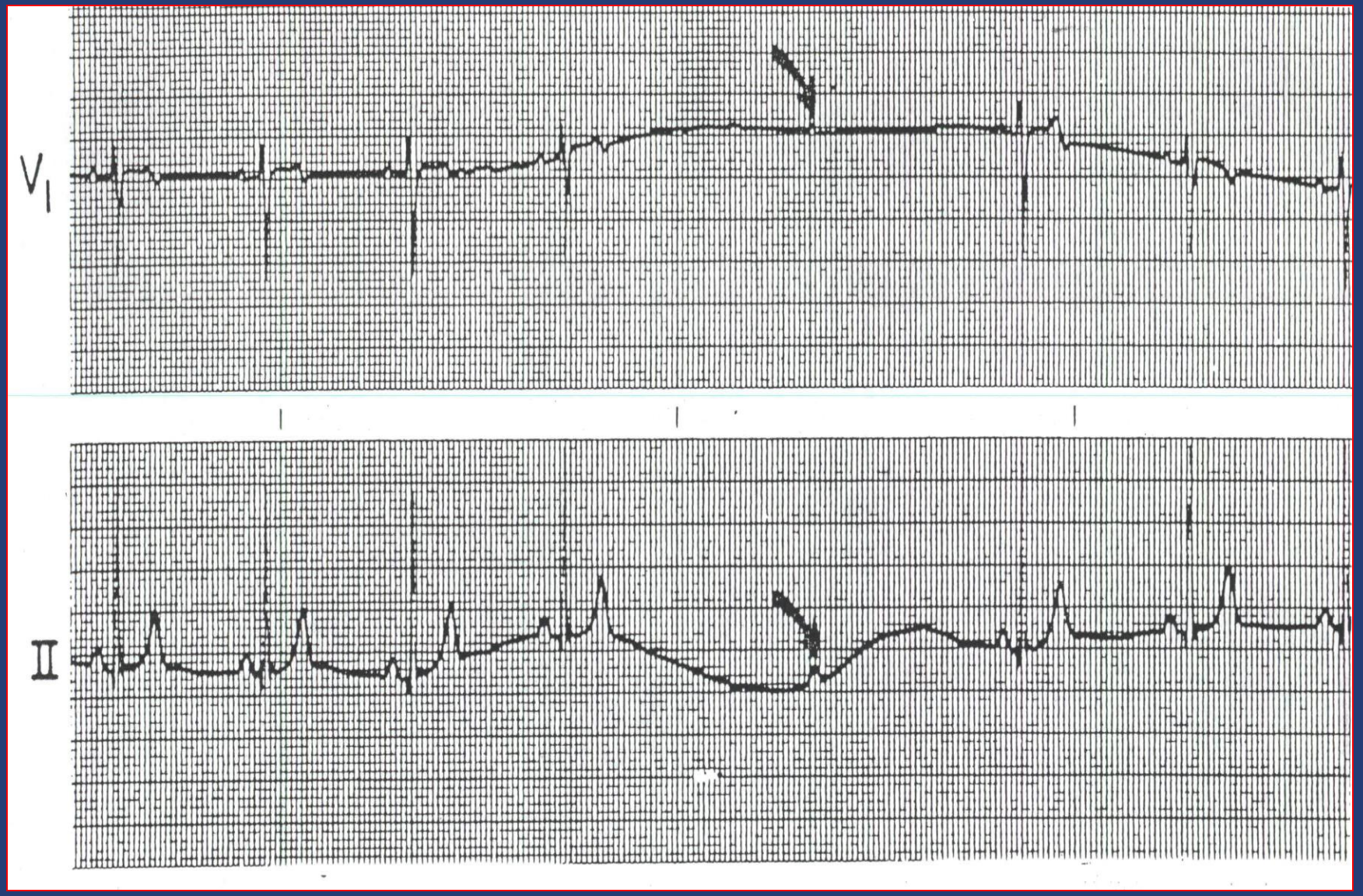
Brugada Criteria



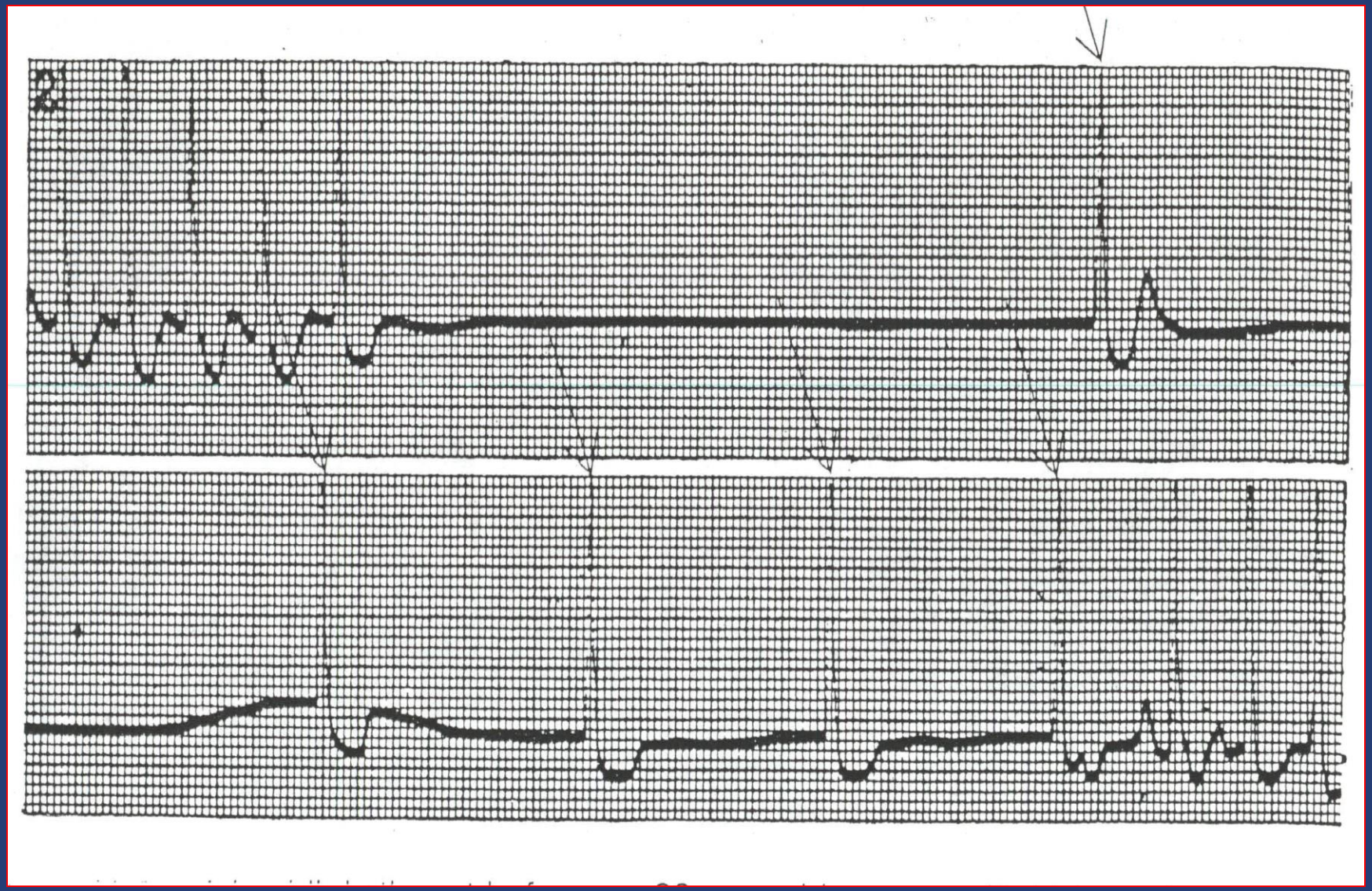
Polymorphic VT – Torsades de Pointes



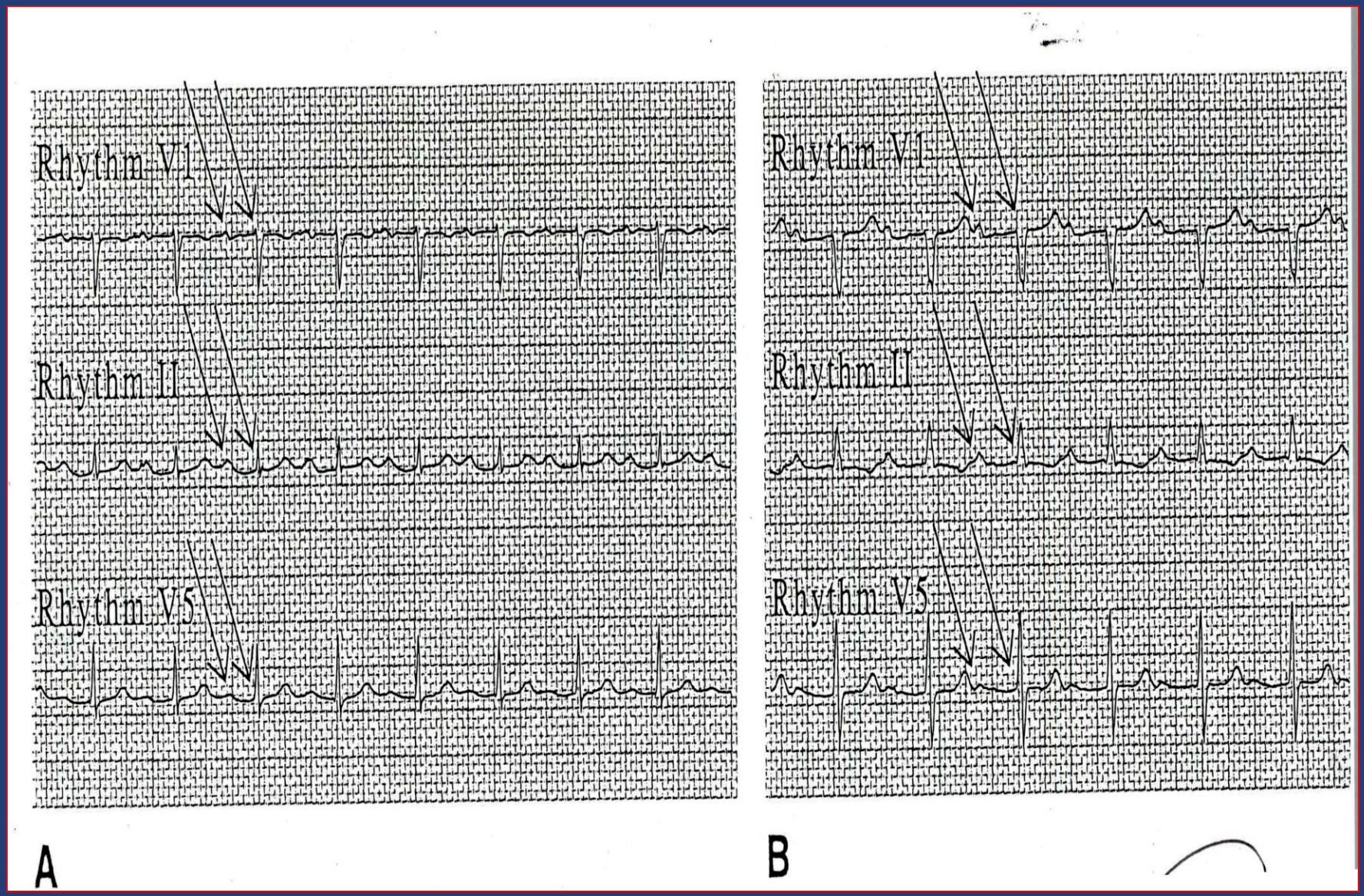
Escape Rhythms



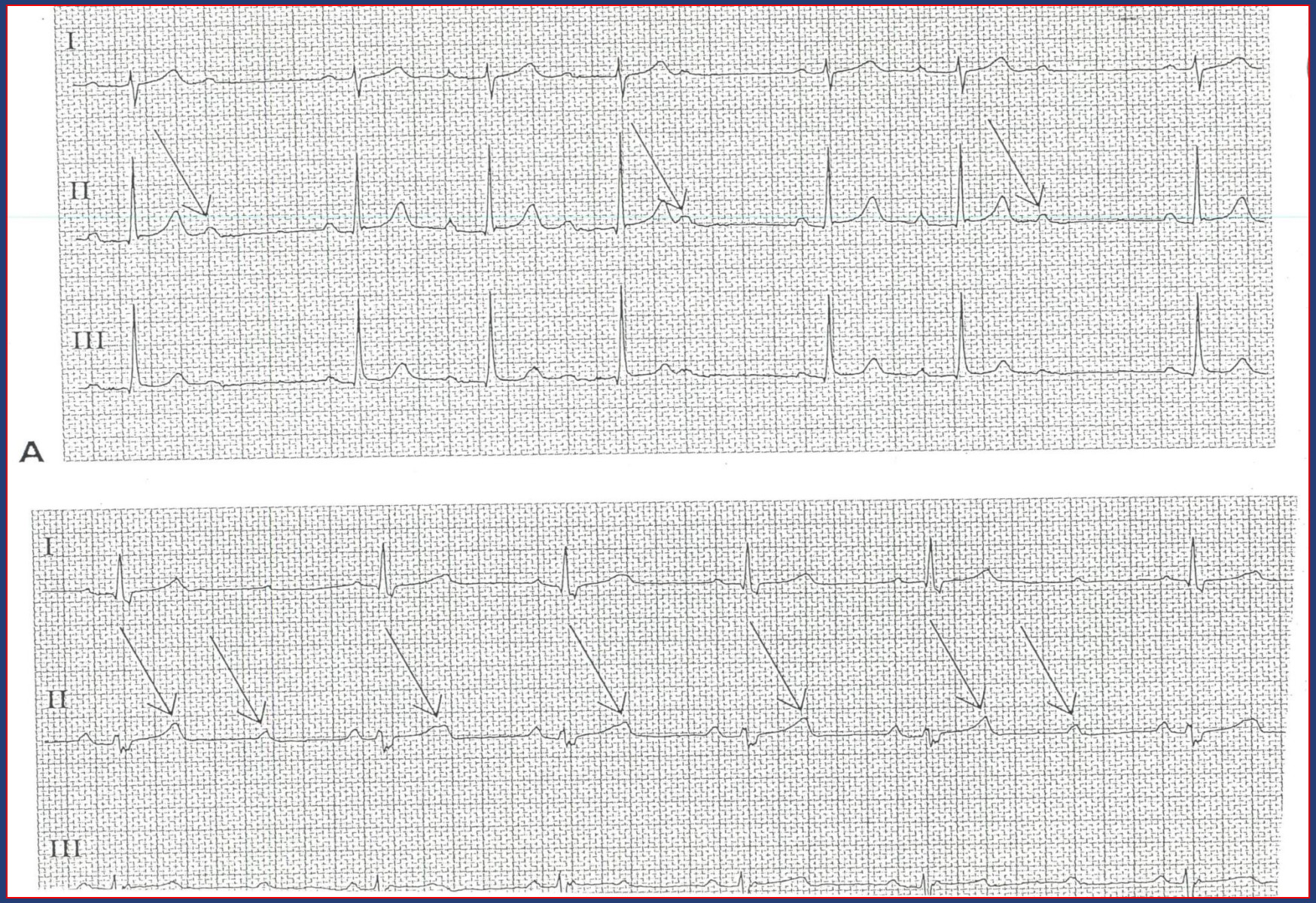
Sinus Bradycardia with AV block - Vasovagal



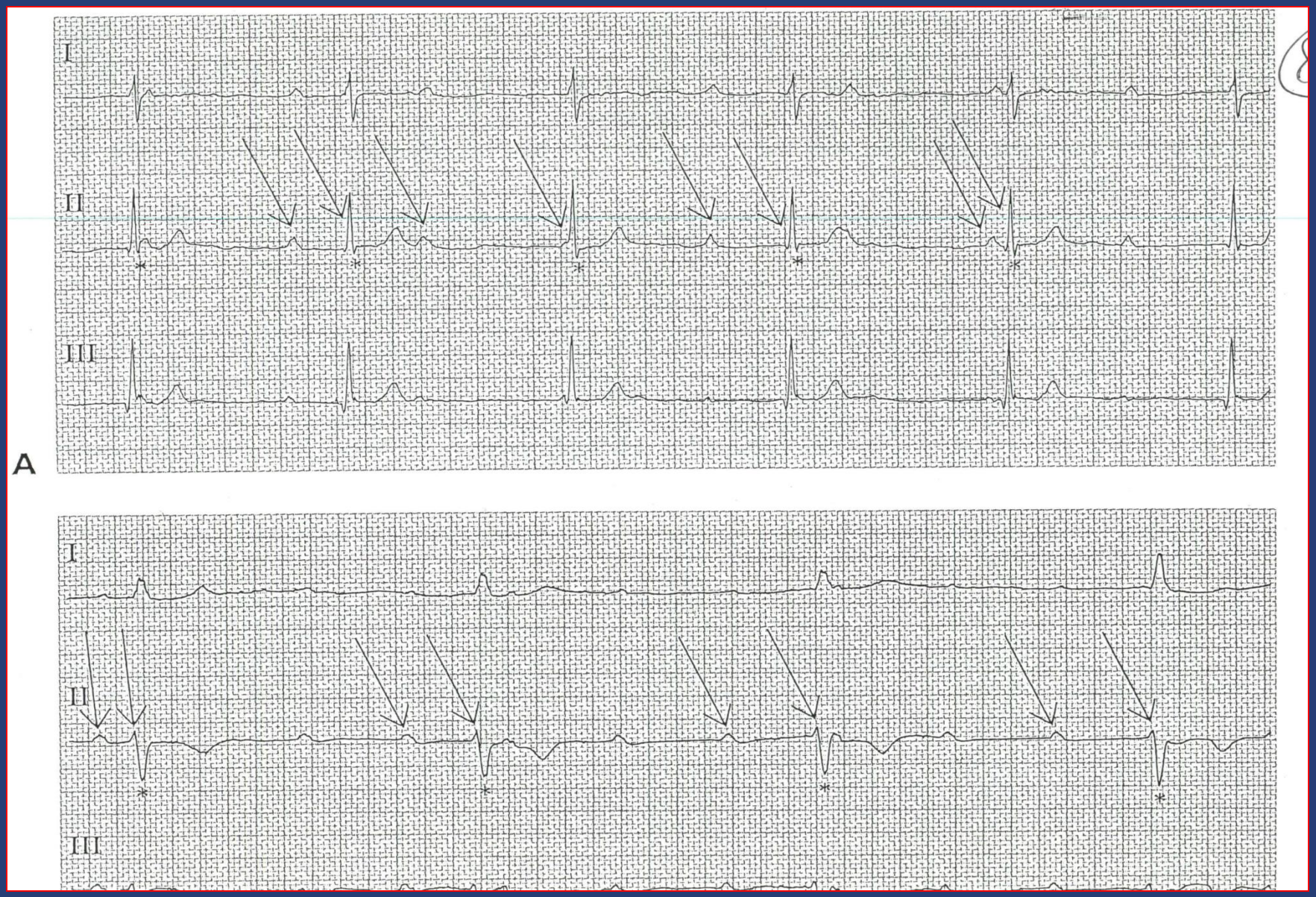
Junctional Escape Rhythm at Termination of SVT – Brady-Tachy syndrome = Sick Sinus Syndrome



First Degree AV Block



Second Degree AV block – Mobitz Type I (Top) and Mobitz Type II (Bottom)



Third Degree AV Block with Escape Rhythm

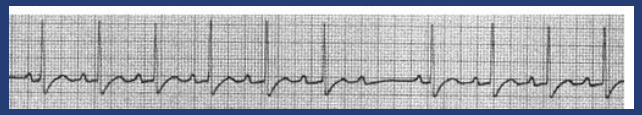
Thank you!

Question 1

A 65 Year old woman presents to the emergency room with a pre syncopal episode that occurred while she was preparing dinner. She felt lightheaded but had enough warning to brace herself to keep from falling. She has never lost consciousness and the episode resolved within few minutes. Her physical examination was normal. While monitored she had a recurrent episode. Which of the following electrocardiograms would likely warrant admission for pacemaker insertion?

A

B



C

D

E

The correct answer is E

Educational objectives : understand the various degrees of conduction abnormalities and heart block

- Option E - EKG shows clear evidence of complete heart block, with complete dissociation between the atrial and ventricular activity. This finding warrants permanent pacemaker insertion.
- Option A - shows sinus rhythm with marked 1st degree atrioventricular block. This finding is not likely to be related to her symptoms.
- Option B - shows 1.2 seconds pause, it is clearly related to a non-conducted premature atrial beat that does not conduct to the ventricle. It does not represent a pathological block and usually is not symptomatic.
- Option C - shows classic type 1 2nd degree atrioventricular block.
- Option D - shows minimally premature atrial complex that does not conduct to the ventricles. The next PT is a junctional complex and occurs before the subsequent sinus discharge arises. This occurrence does not represent heart block. The sinus P wave is seen immediately after the QRS complex.

References :

- Kusumoto FM, Schoenfeld MH, Barrett C, et al. 2018 ACC/AHA/HRS Guideline on the Evaluation and Management of Patients With Bradycardia and Cardiac Conduction Delay: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines, and the Heart Rhythm Society. J Am Coll Cardiol 2018;Oct 28:[Epub ahead of print].

Question 2

In which of the following patient would implantation of a permanent pacemaker be appropriate?

A. A 47-year-old man who is taking beta blockers for hypertension and has symptomatic sinus bradycardia with heart rate of 45 beats per minute
B. A 20-year-old college student who has syncope after prolonged standing at band practice and has sinus bradycardia heart rate of 45 beats per minute on evaluation
C. A 57-year-old man with exercise intolerance and an average heart rate of 45/ minute and a peak rate of 60/minute on an ambulatory monitor
D. A 75-year-old woman who has transient heart block in the hours after an acute inferior wall MI

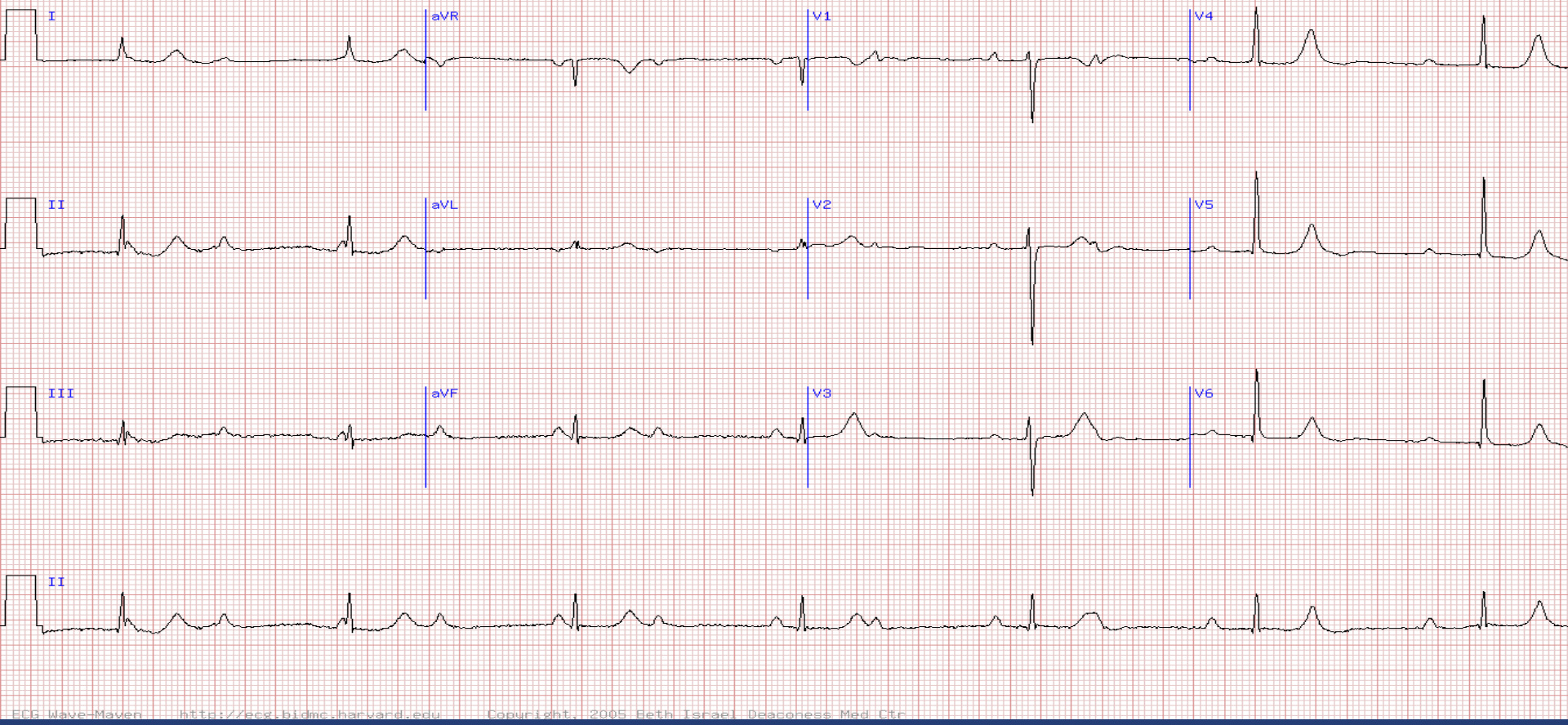
The correct answer is C

- Sinus node dysfunction is often the primary diagnosis for implantation of a permanent pacemaker. A persistently slow heart rate and the inability to accelerate the heart rate appropriately are common findings. Pacing is also indicated in patients who have sinus node dysfunction and symptomatic chronotropic incompetence. In patients who have symptomatic iatrogenic bradycardia pacing should be implemented on leave when the implicating drug cannot be discontinue.
- Permanent pacemakers have a lesser role in the management of neurocardiogenic syncope and are considered in patients who do not respond to therapy.
- Heart block that occurs early after the inferior myocardial wall infarction is common and usually reversible without affecting outcomes.
- In a 20-year-old student asymptomatic resting heart rate of 45/min is not an abnormal finding.

References

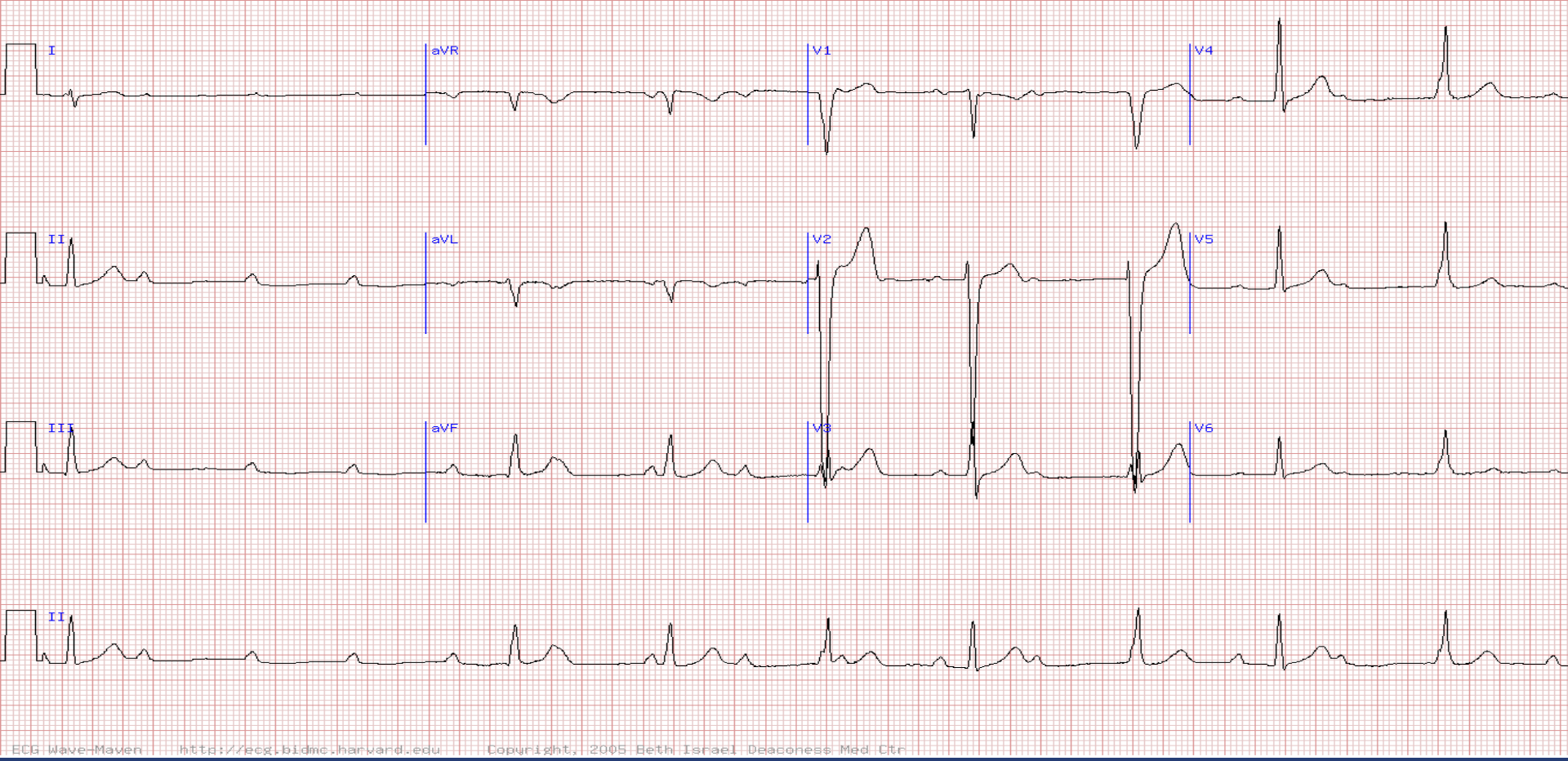
- Kusumoto FM, Schoenfeld MH, Barrett C, et al. 2018 ACC/AHA/HRS Guideline on the Evaluation and Management of Patients With Bradycardia and Cardiac Conduction Delay: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines, and the Heart Rhythm Society. J Am Coll Cardiol 2018;Oct 28:[Epub ahead of print].

- De Ponti R, Marazzato J, Bagliani G, Leonelli FM, Padeletti L. Sick Sinus Syndrome. Card Electrophysiol Clin. 2018 Jun;10(2):183-195.



The patient is a 47-yr-old female who is asymptomatic with the following ECG. What is the bradyarrhythmia?

A. 1st degree AV block
B. Mobitz Type I AV block
C. Sinus rhythm with blocked PACs
D. Mobitz Type II AV block
E. 3rd degree AV block



The findings on this EKG are most consistent with which clinical scenario?

A. Severe chest pain
B. Sick sinus syndrome
C. Lyme carditis
D. Tricyclic overdose

- A 54 Y/O W, evaluated in the ER after a syncopal episode resulting in a MVA. H/O recurrent syncope since age 16. Only one syncope between ages 24-53. 3 episodes in the last 2 years. Holter 6 mo ago- 4 sec sinus pause during an episode noted. Increased salt and fluid intake advised. No other past history or meds.

What will help in prevention of an episode in the future.

a. Positive pressure stocking
b. Tilt table testing
c. Dual chamber Pacer
d. Fludrocortisone
e. Midodrine