



Ventricular Arrhythmia

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VENTRICULAR ARRHYTHMIA

- *1-pvc*
- *2-Idioventricular rhythm*
- *3-accelerated idioventricular rhythm*
- *4-ventricular tachycardia*
- *5-torsad de point*
- *6-Ventricular flutter*
- *7-Ventricular fibrillation*
- *8-Ventricular asystole*



CAUSES OF PVC

1. CAD (angina –MI)
2. Alcohol
3. Cigarette
4. Anxiety
5. Fatigue
6. Dig toxicity
7. Hyperthyroidism
8. COPD
9. VHD (mvp)
10. normal

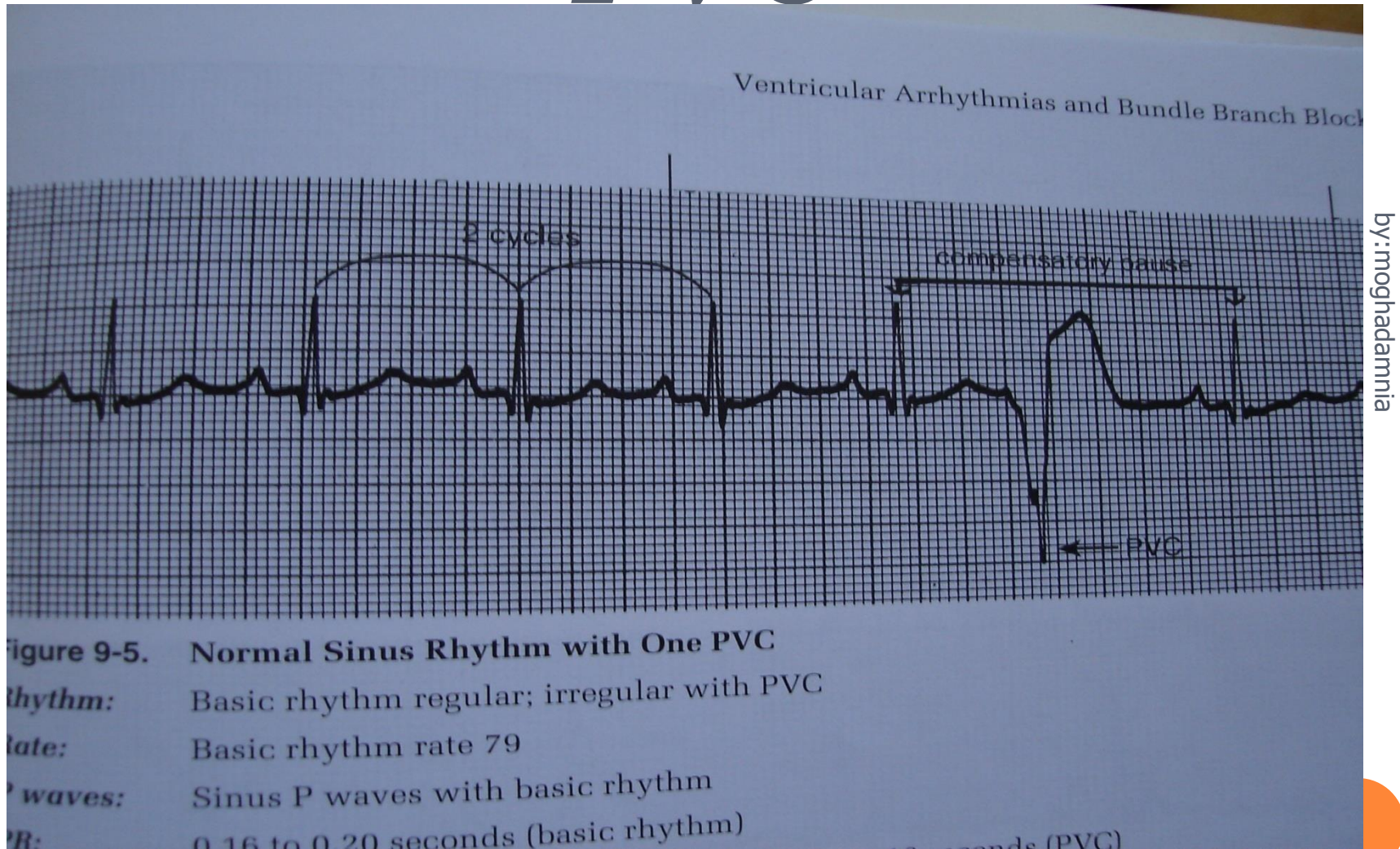


CLINICAL FINDINGS IN PVC

- Irregular pulse
- Palpitation
- Skipped beat
- Fluttering sensation

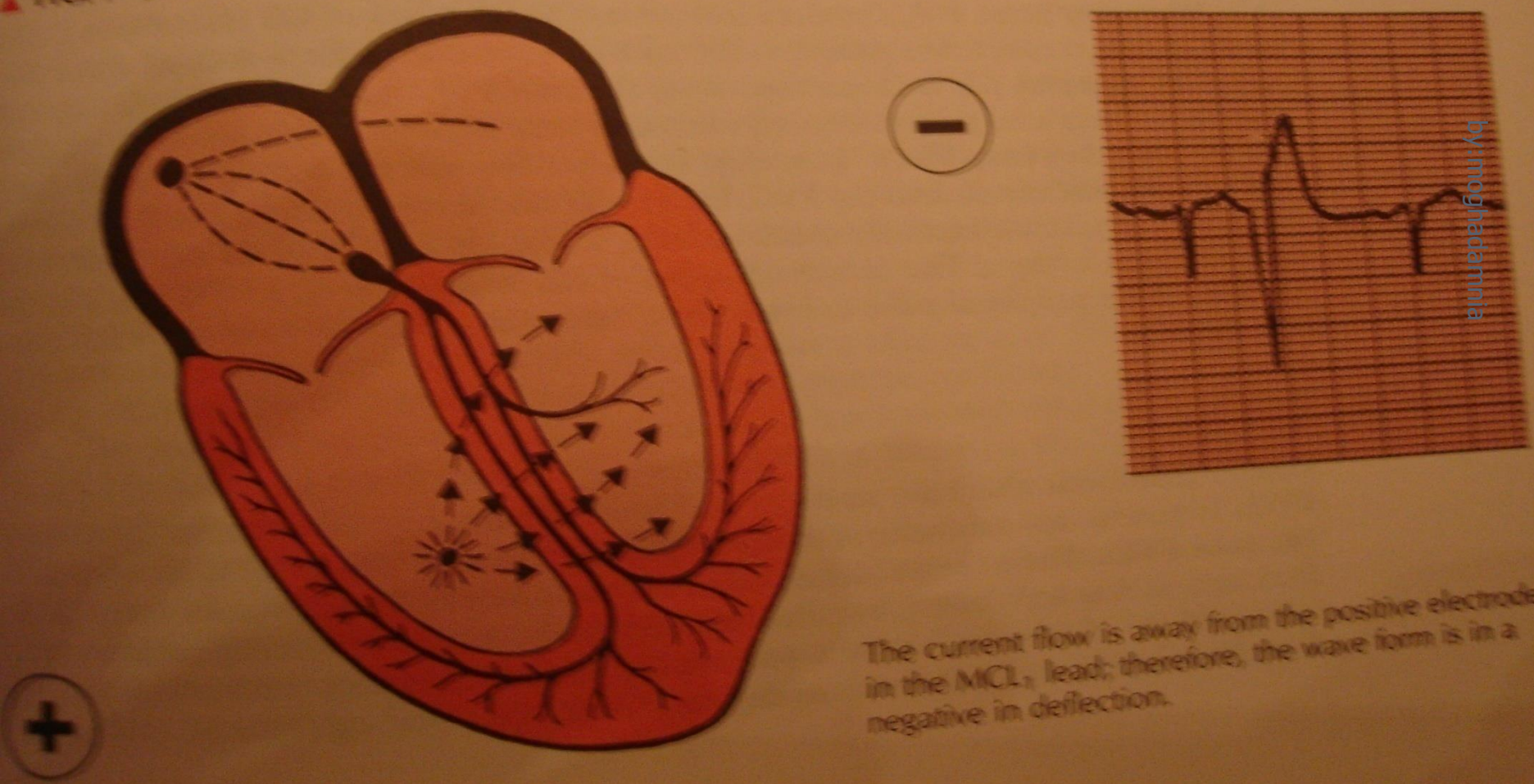


PVC



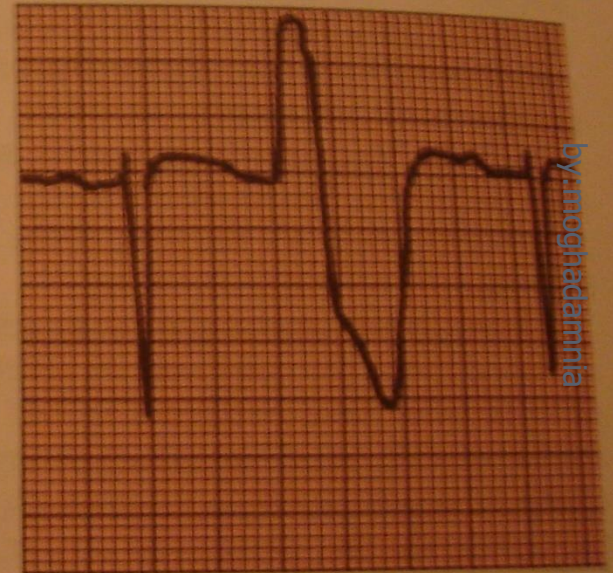
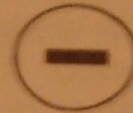
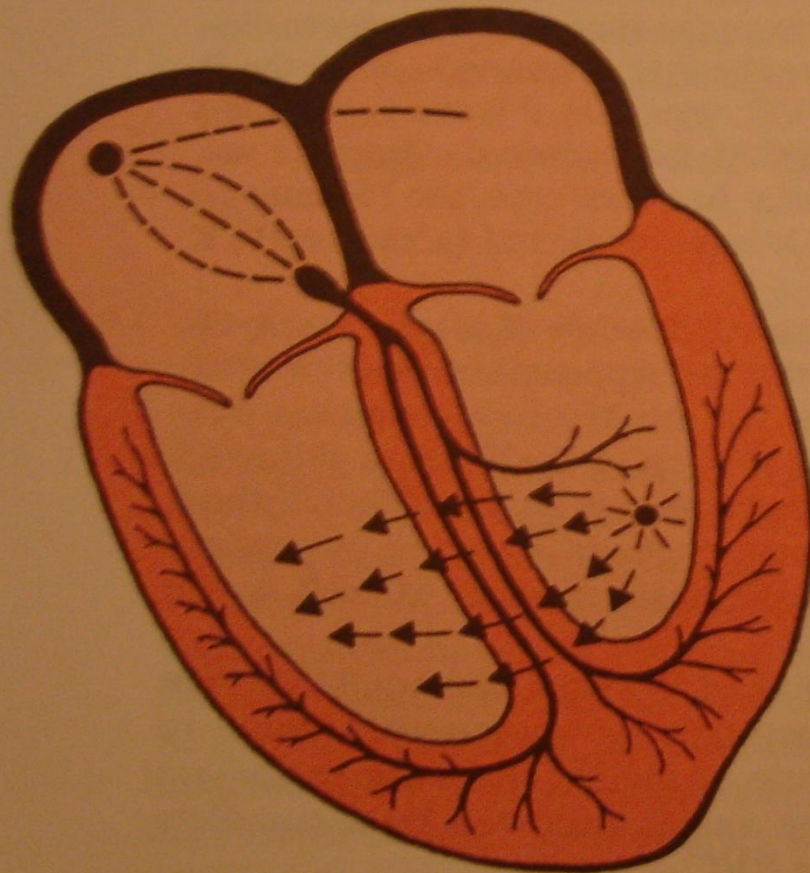
The reason most PVCs have complete compensatory pauses after them is because the depolarization of the ventricles from a ventricular focus is usually isolated from the sinus node; that is, these ventricular impulses do not disrupt the internal regular rhythm of the sinus node. The sinus beats after the PVC fall back in cycle with the sinus beats preceding

FIG. 7-6. Current flow and wave form from a right ventricular PVC.



The current flow is away from the positive electrode in the MCL₁ lead; therefore, the wave form is in a negative in deflection.

FIG. 7-7. Current flow and waveform from a left ventricular PVC.



The current flow is toward the positive electrode in the MCL₁ lead; therefore, the waveform is in a positive direction.

PVC TRIGEMINAL

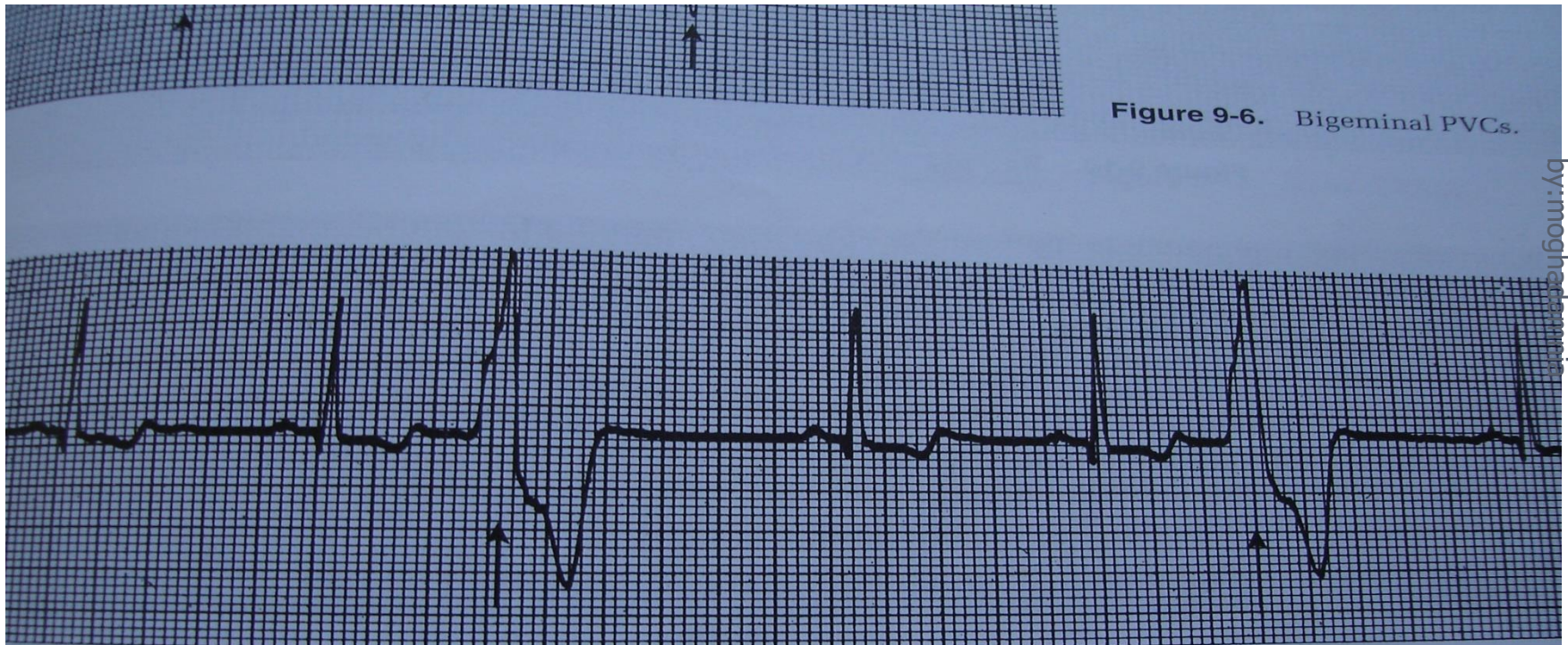


Figure 9-6. Bigeminal PVCs.

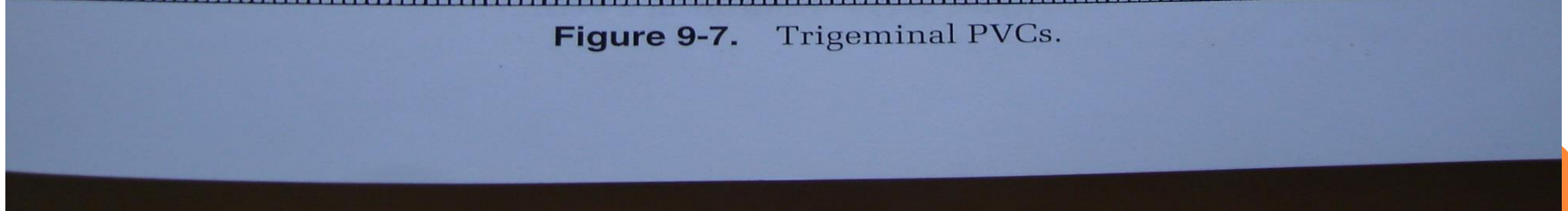


Figure 9-7. Trigeminal PVCs.

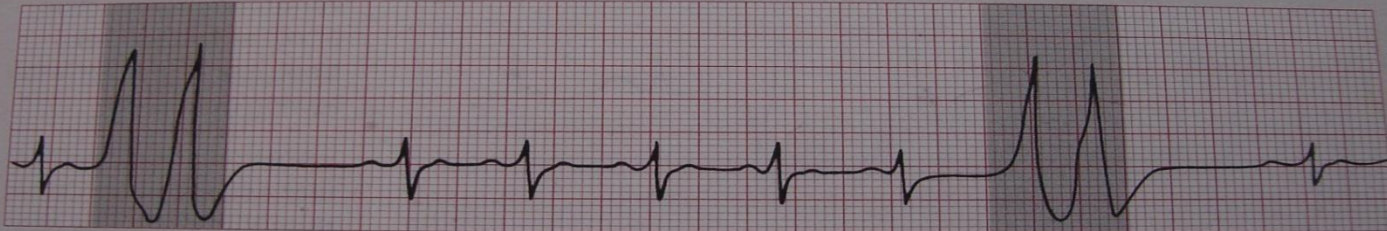
PVC PAIRED

When PVCs spell danger

Here are some examples of patterns of dangerous premature ventricular contractions (PVCs).

Paired PVCs

Two PVCs in a row are called a pair or couplet (see highlighted areas). A pair can produce ventricular tachycardia because the second contraction usually meets refractory tissue. A salvo — three or more PVCs in a row — is considered a run of ventricular tachycardia.



Multiform PVCs

PVCs that look different from one another arise from different sites or from the same site with abnormal conduction (see highlighted areas). Multiform PVCs may indicate severe heart disease or digitalis toxicity.



PVC MULTIFORM

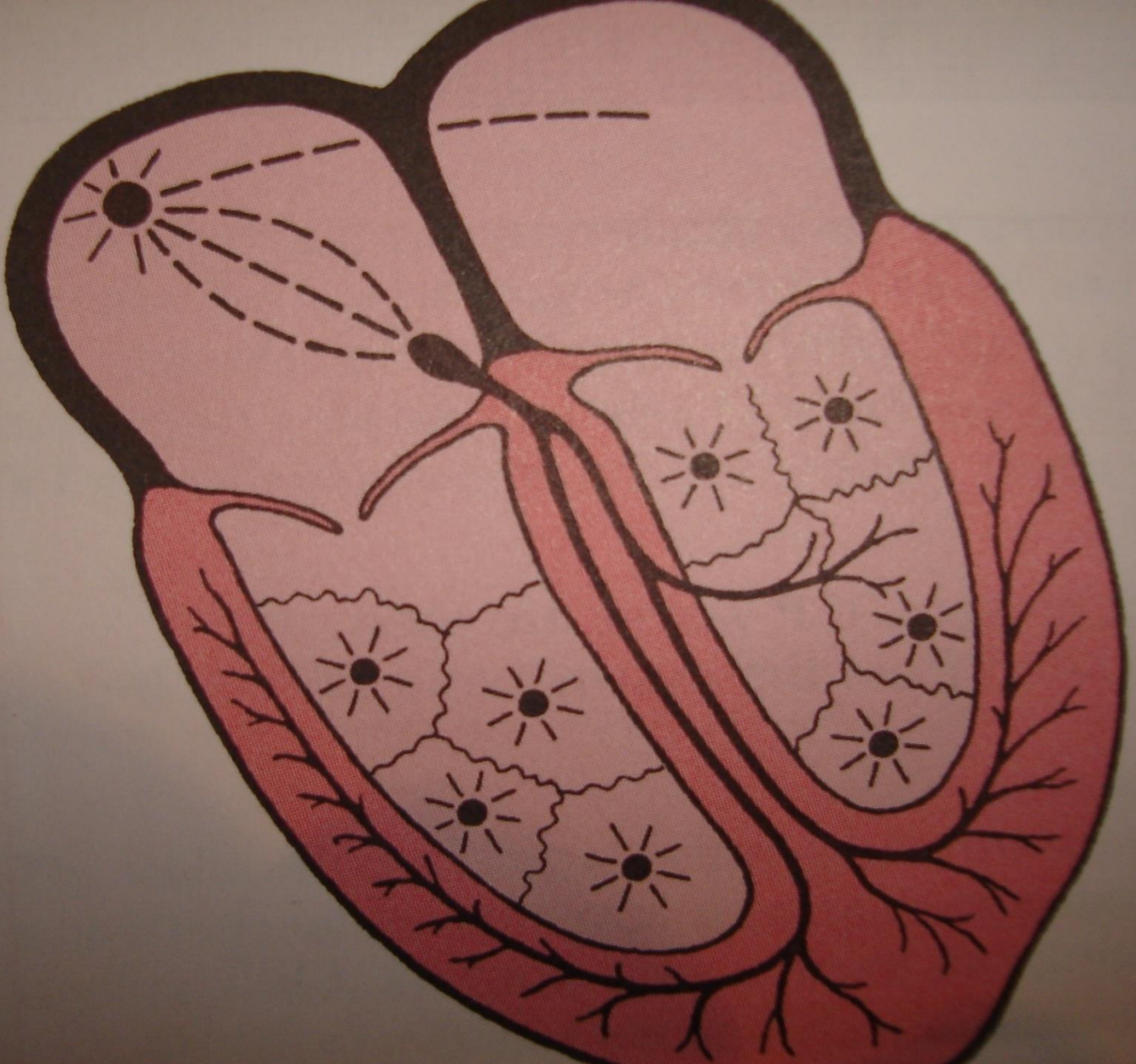
Multiform PVCs

PVCs that look different from one another arise from different sites or from the same site with abnormal normal conduction (see highlighted areas). Multiform PVCs may indicate severe heart disease or digitalis toxicity.



Bigeminy and trigeminy

PVCs that occur every other beat (bigeminy) or every third beat (trigeminy) can result in



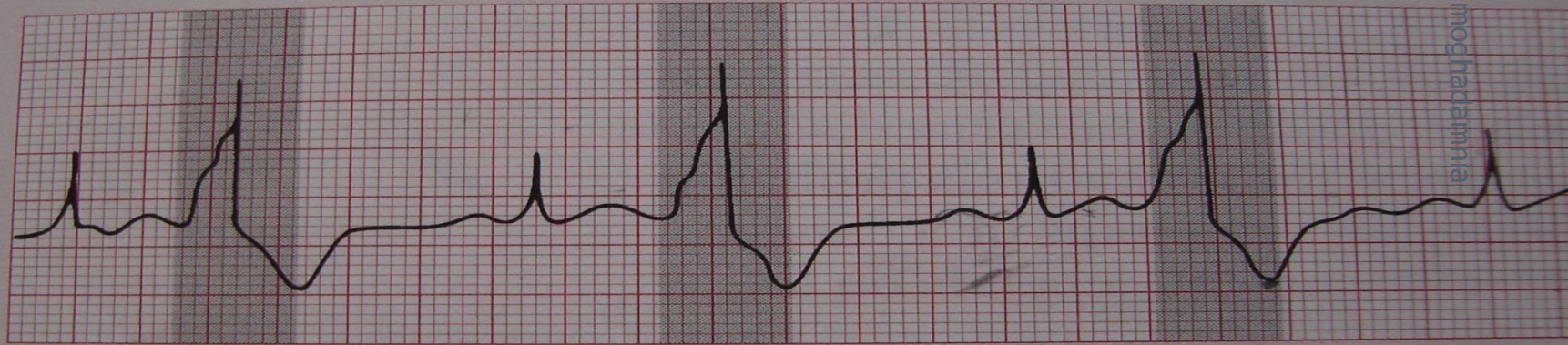
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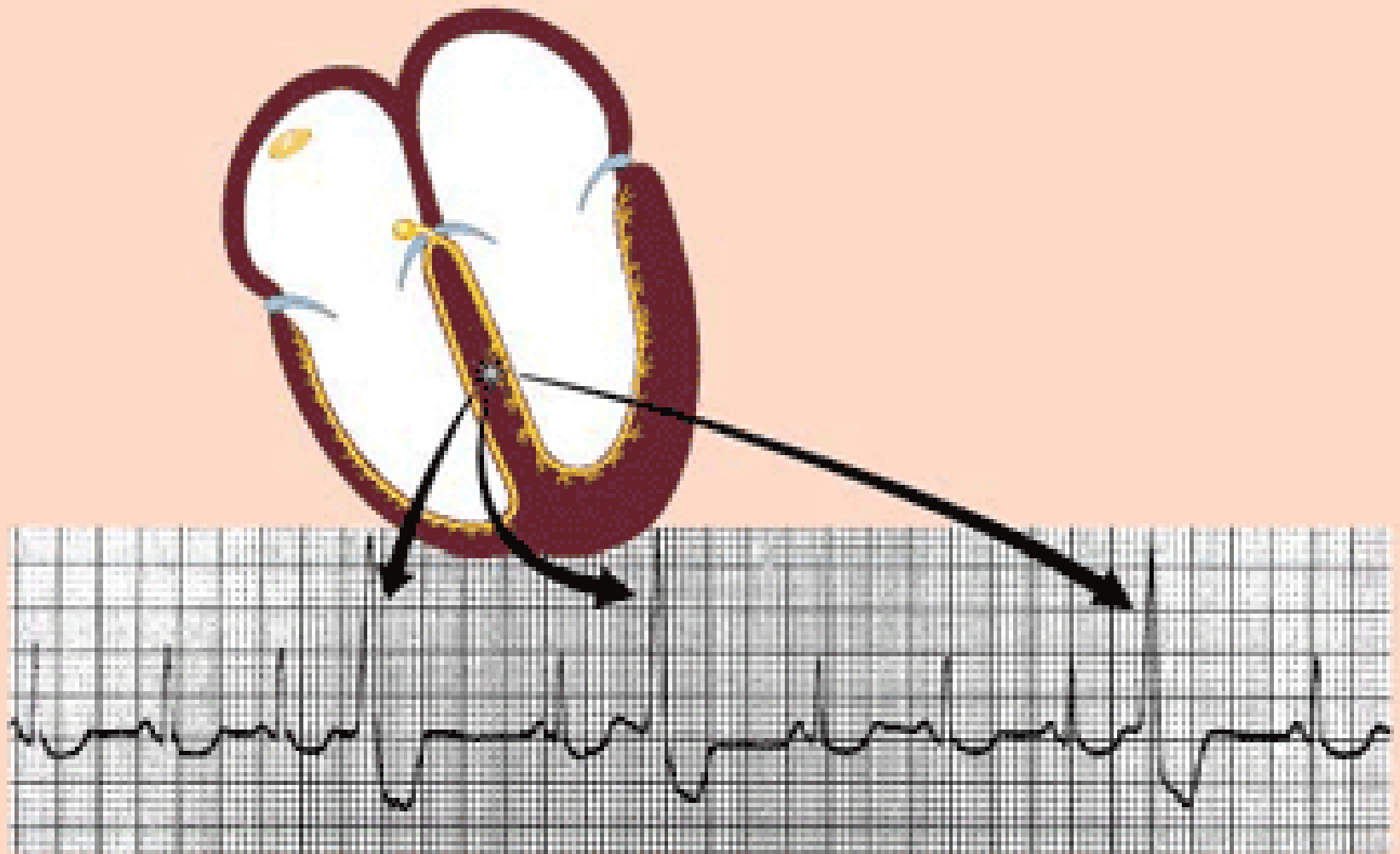
PVC UNIFORM

Bigeminy and trigeminy

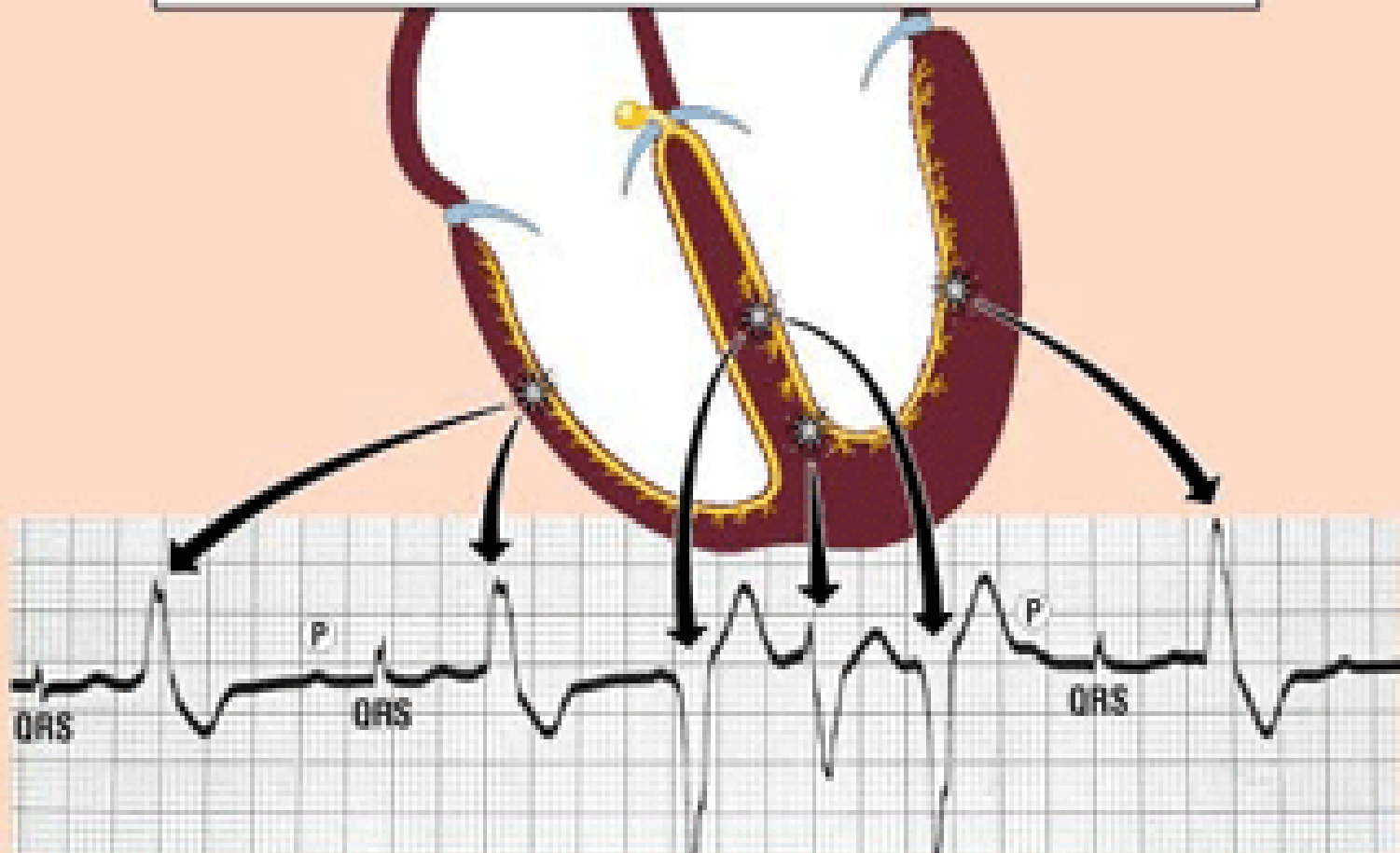
PVCs that occur every other beat (bigeminy) or every third beat (trigeminy) are associated with tachycardia or ventricular fibrillation (see highlighted areas).



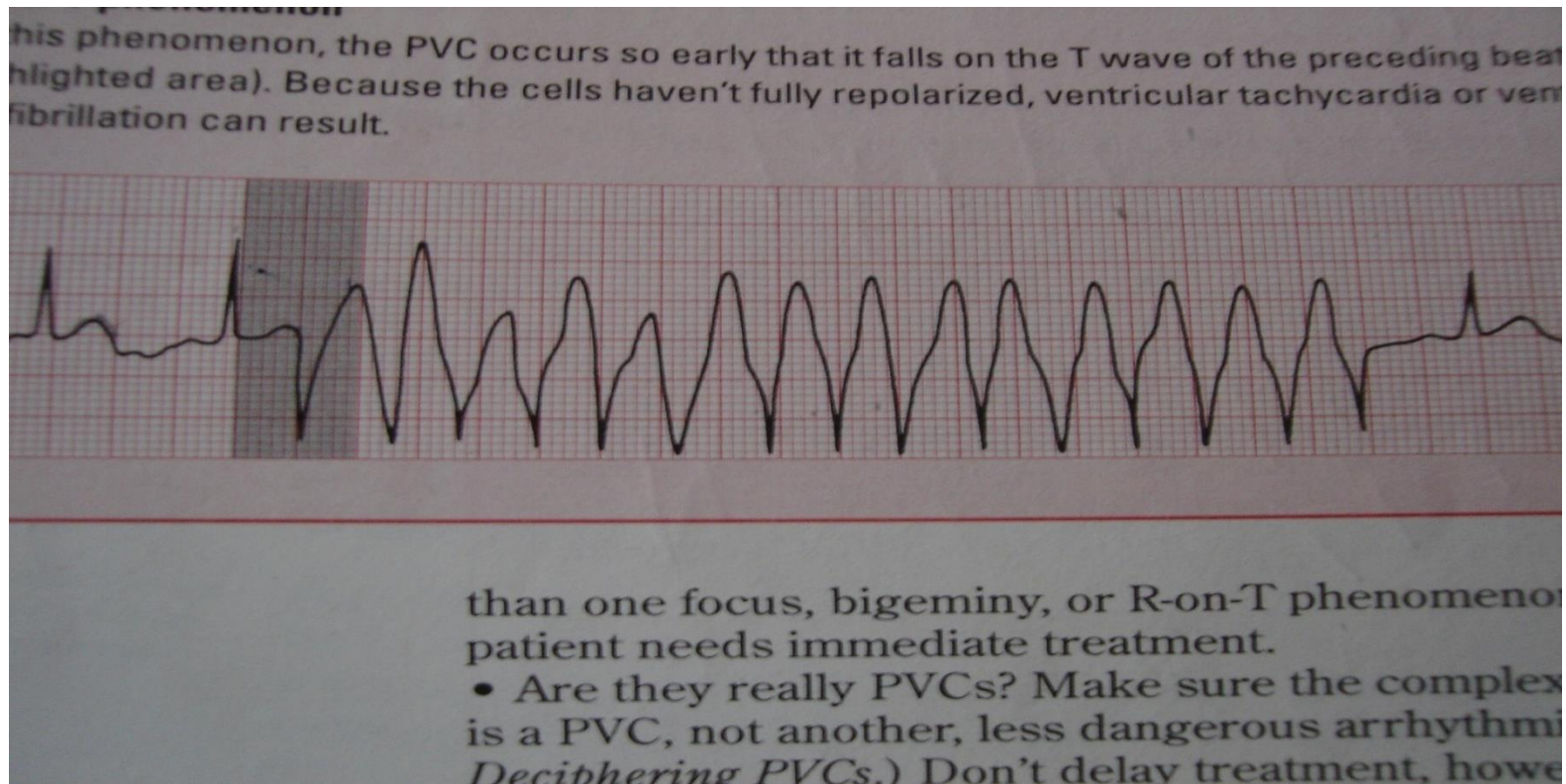
Multiple PVC's from an irritable focus

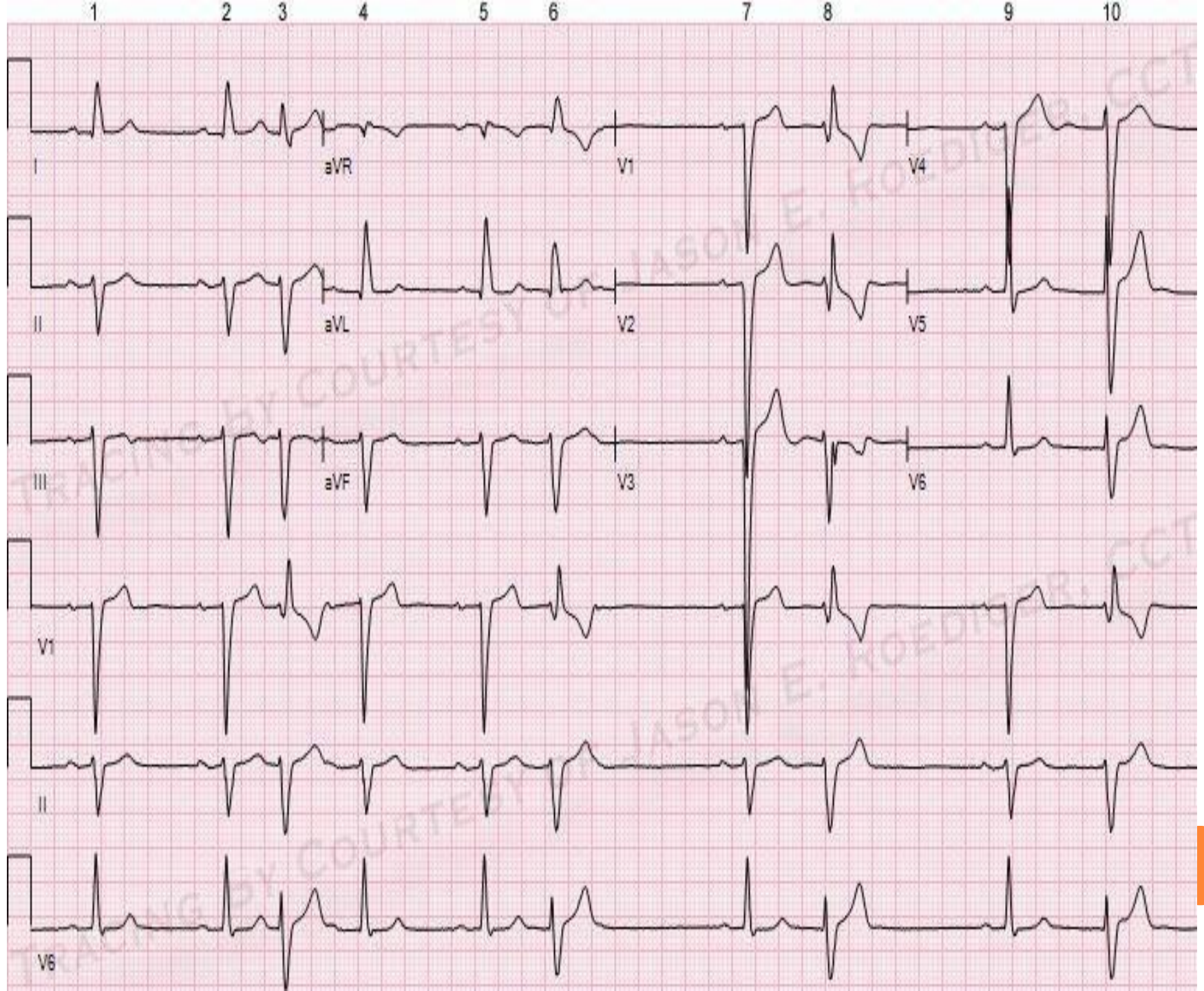


**Each irritable focus produces
its own distinctive PVC**



R ON T PHENOMENON





by:moghadamia

INTERVENTION IN PVC

Underling cause

First rapid infusion (10-15 mg/min) 150 mg in 10 min

amiodaron  slow infusion 1mg/min in 6 hour (360 mg in 6 h

maintenance (0.5 mg/min) in 18 hour (540 mg in 18 h

Xylocain  attack dose(1 -3 mg/kg)
maintenance (1-4 mg/min)

PVC & ESCAPE BEAT

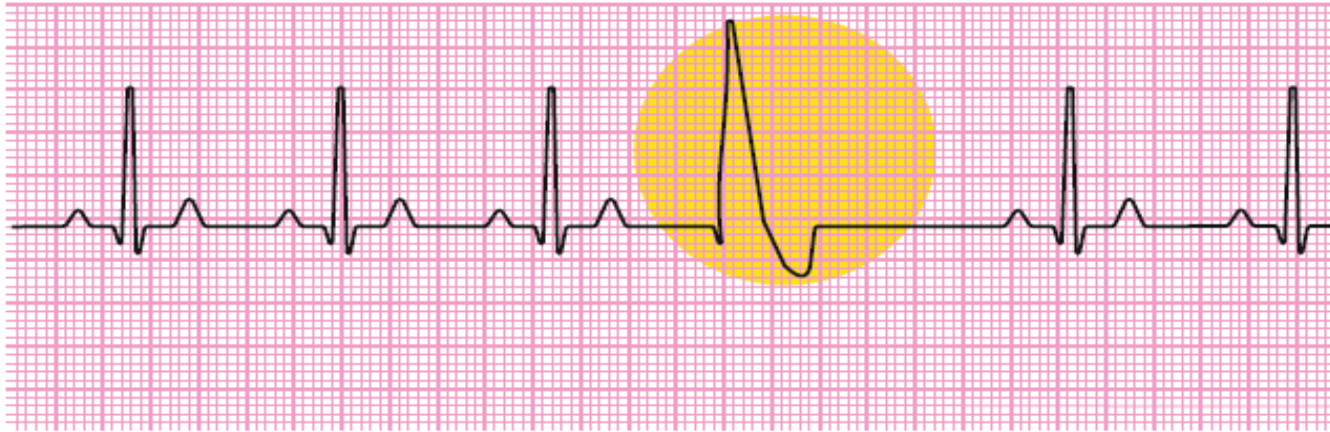


Fig. 6.17 Premature beat

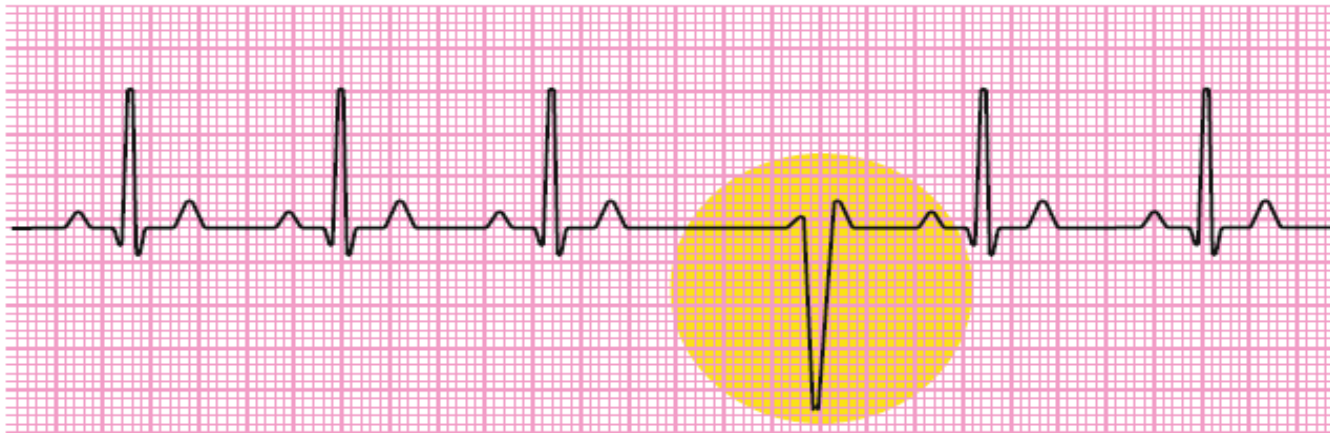


Fig. 6.18 Escape beat

CAUSES OF *IDIOVENTRICULAR RHYTHM*

- Inactivity in SA node & AV node



ECG FINDING

IDIOVENTRICULAR RHYTHM

1. *Rhythm :regular*
2. *Rate :20-40*
3. *P wave : absent*
4. *PR interval : unmeasurable*
5. *QRS : wide(>0/12)*
6. *T wave : abnormal*
7. *QT interval: unmeasurable*

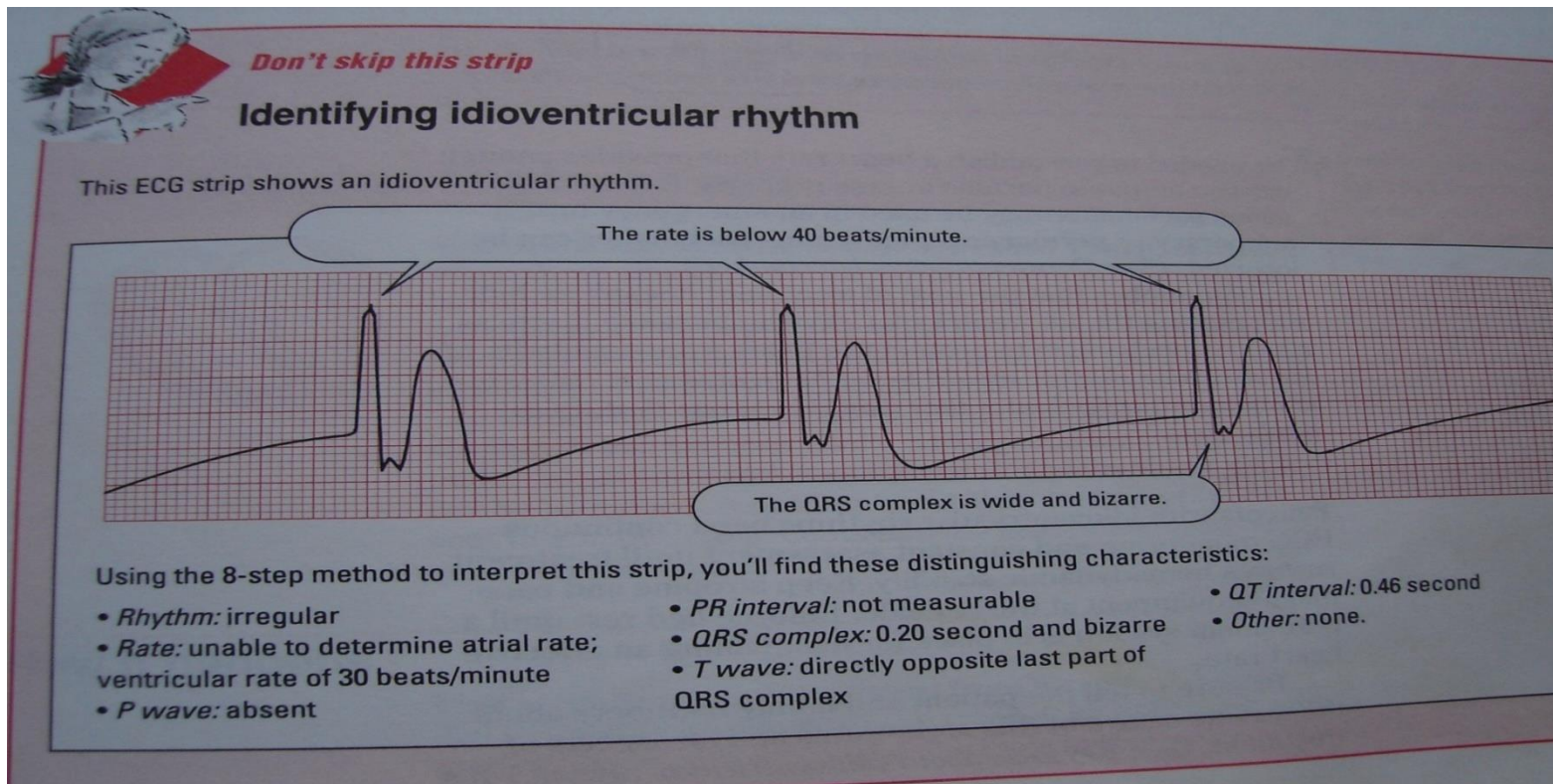


CLINICAL FINDINGS IN *IDIOVENTRICULAR RHYTHM*

- Sign of COP ↓ (BP ↓ -syncope)



Idioventricular Rhythm



INTERVENTION

- Underling cause
- Atropin
- isoprel
- pacemaker



CAUSES OF ACCELERATED *IDIOVENTRICULAR RHYTHM*

- CAD (MI)
- Electrolyte imbalance
- Dig toxicity
- Reperfusion



CLINICAL FINDINGS IN ACCELERATED *IDIOVENTRICULAR RHYTHM*

- No symptom
- Sign of COP ↓ (BP ↓-syncope)



ECG FINDING

ACCELERATED *IDIOVENTRICULAR* *RHYTHM*

1. *Rhythm :regular*
2. *Rate :40- 100*
3. *P wave : absent*
4. *PR interval : unmeasurable*
5. *QRS : wide(>0.12)*
6. *T wave : abnormal*
7. *QT interval: unmeasurable*



ACCELERATED IDIOVENTRICULAR RHYTHM

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VENTRICULAR ARRHYTHMIAS

Accelerated idioventricular rhythm

An accelerated idioventricular rhythm has the same characteristics as an idioventricular rhythm except that it's faster. The rate shown here varies between 40 and 100 beats/minute.

The rate is 40 to 100 beats/minute.

The QRS complex is wide and bizarre.

be needed to reestablish a heart rate that provides enough cardiac output to perfuse organs properly. A transcutaneous pacemaker may be used in an emergency until a



INTERVENTION IN IDIOVENTRICULAR RHYTHM

- Underling cause

- First rapid infusion (10-15 mg/min) 150 mg in 10 min

- Amiodaron

- slow infusion 1mg in 6 hour (360 mg in 6 h

- maintenance (0.5 mg/min) in 18 hour (540 mg in 18

- Xylocain

- attack dose(1 -3 mg/kg)

- maintenance (1-4 mg/min)

CAUSES OF VENTRICULAR TACHYCARDIA

- CAD (MI)
- Electrolyte imbalance
- Dig toxicity
- CMP
- And Other ethiology of PVC



ECG FINDING

VENTRICULAR TACHYCARDIA

1. *Rhythm :regular*
2. *Rate :100-240*
3. *P wave : absent*
4. *PR interval : unmeasurable*
5. *QRS : wide(>0.12)*
6. *T wave : abnormal*
7. *QT interval: unmeasurable*



CLINICAL FINDINGS IN VENTRICULAR TACHYCARDIA

- IF **pulseness** no hemodynamic problem
- If **pulseless** VT Sign of $\text{COP} \downarrow$ ($\text{BP} \downarrow$ - syncope) and apnea



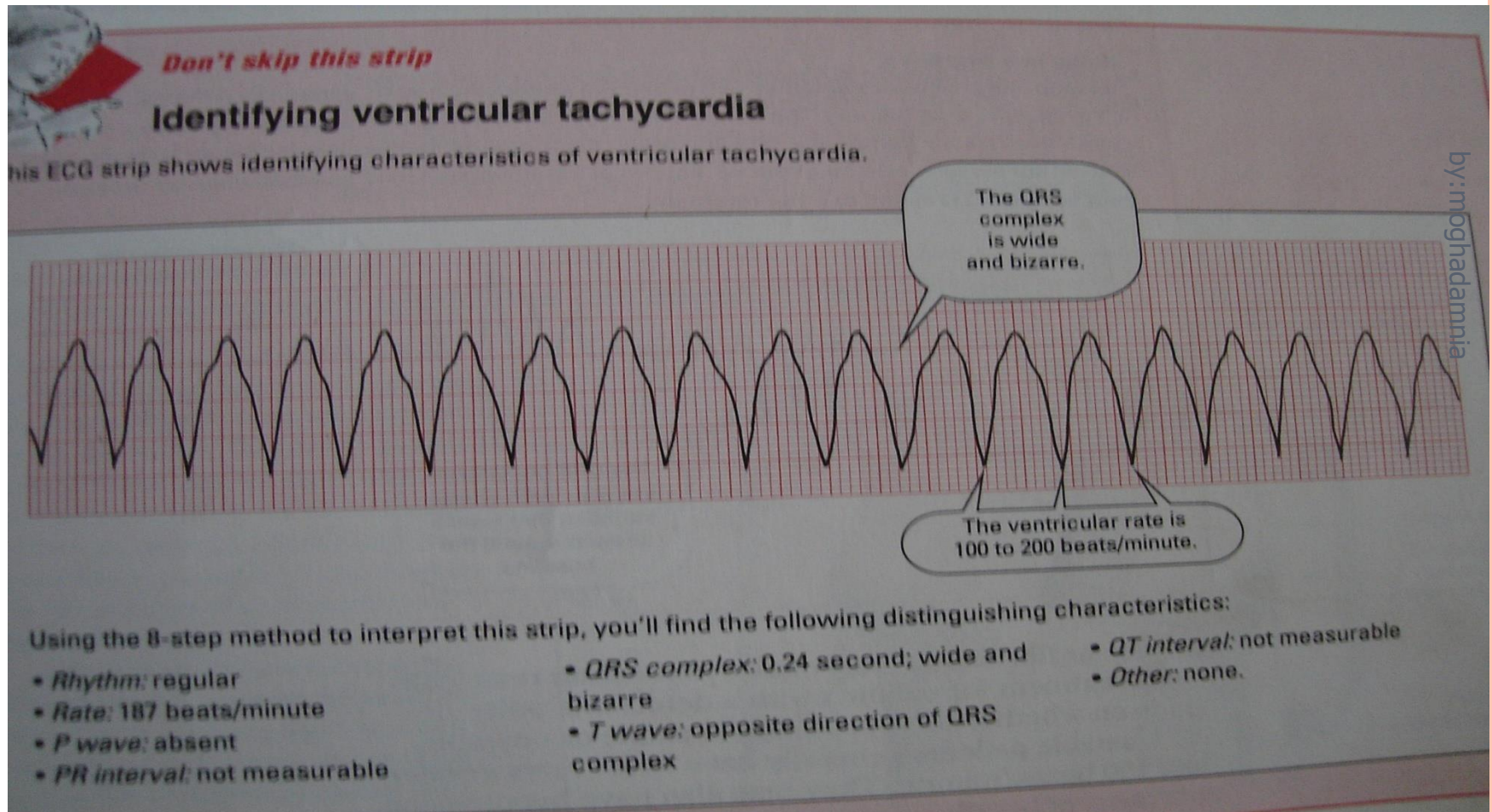
24-H RECORD



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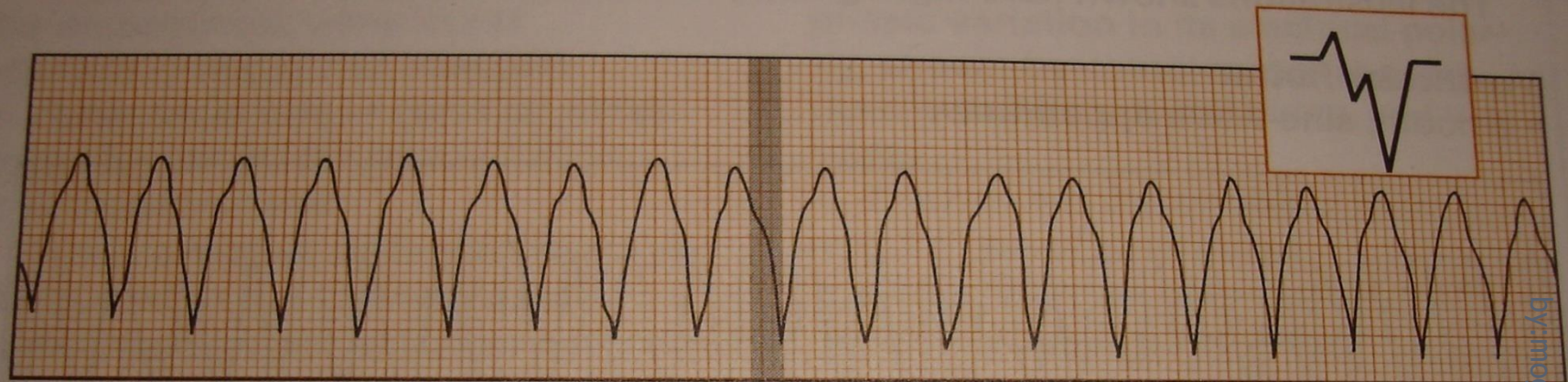
VENTRICULAR TACHYCARDIA



Ventricular tachycardia

- If the QRS complex has an R wave ≥ 0.04 second, a slurred S (shown be-

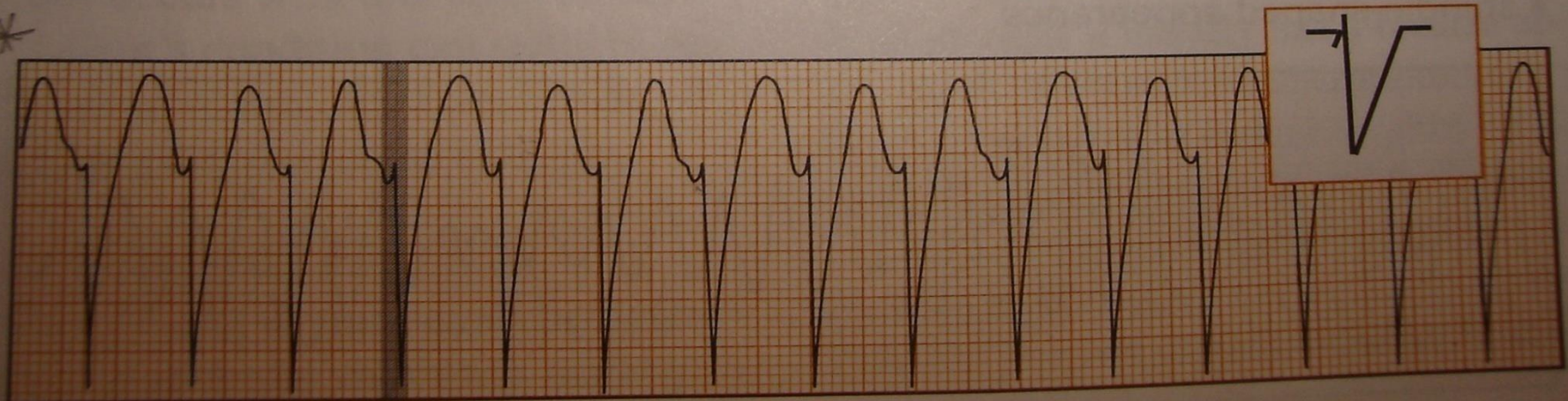
low, shaded), or a notched S (shown below at right) on the downstroke, suspect VT.

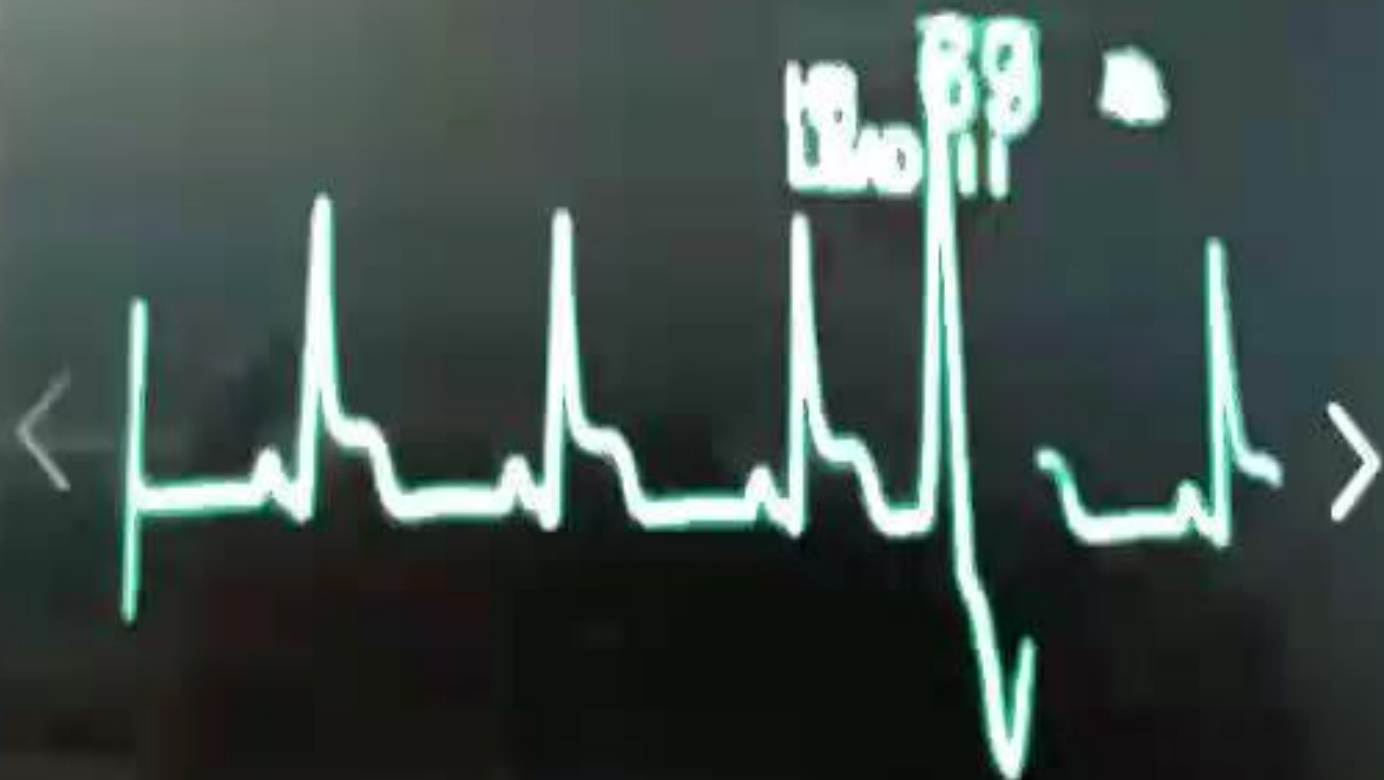


Supraventricular tachycardia

- If the QRS complex has an R wave ≤ 0.04 second and a swift, straight S

on the downstroke (shown below, shaded, and below right), suspect SVT with aberrancy.





0:00 / 1:13



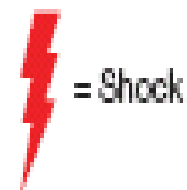
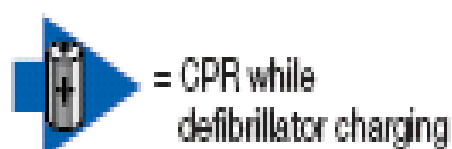
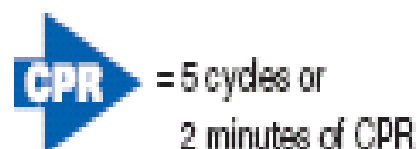
اشتراک گذاری ارسال پسندیدن

INTERVENTION IN VENTRICULAR TACHYCARDIA

- Adult stable monomorphic VT responds well to
- monophasic or biphasic waveform cardioversion (synchronized) shocks at initial energies of 100 J.
- - First rapid infusion (10-15 mg/min) 150 mg in 10 min
 -
 - **Amiodaron**
 - slow infusion 1mg in 6 hour (360 mg in 6 h)
 - maintenance (0.5 mg/min) in 18 hour (540 mg in 18 h
 -
 - **Xylocaine**
 - attack dose(1 -3 mg/kg)
 - maintenance (1-4 mg/min)
 -



Ventricular Fibrillation/Pulseless VT



b. Ventricular tachycardia

Class I

1 Sustained (more than 30 seconds or causing hemodynamic collapse) polymorphic VT should be treated with an unsynchronized electric shock with an initial monophasic shock energy of 200 J; if unsuccessful, a second shock of 200 to 300 J should be given, and, if necessary, a third shock of 360 J. (*Level of Evidence: B*)

2 Episodes of sustained monomorphic VT associated with angina, pulmonary edema, or hypotension (blood pressure less than 90 mm Hg) should be treated with a synchronized electric shock of 100 J initial monophasic shock energy. Increasing energies may be used if not initially successful. Brief anesthesia is desirable if hemodynamically tolerable. (*Level of Evidence: B*)

3 Sustained monomorphic VT not associated with angina, pulmonary edema, or hypotension (blood pressure less than 90 mm Hg) should be treated with:

- a. Amiodarone: 150 mg infused over 10 minutes (alternative dose 5 mg/kg); repeat 150 mg every 10 to 15 minutes as needed. Alternative infusion: 360 mg over 6 hours (1 mg/min), then 540 mg over the next 18 hours (0.5 mg/min). The total cumulative dose, including additional doses given during cardiac arrest, must not exceed 2.2 g over 24 hours. (*Level of Evidence: B*)
- b. Synchronized electrical cardioversion starting at monophasic energies of 50 J (brief anesthesia is necessary). (*Level of Evidence: B*)



TORSADE DE POINT POLYMORPHIC VT (IRREGULAR VT).



Torsades de Pointes

- ⊙ “twisting of points” : changing axis of polymorphic QRS VT
- ⊙ Associated with congenital or acquired long QT, severe bradycardia, hypoK, hypoMg, meds (TCAs, procainimide, quinidine)





Torsades de Pointes

⊙ ECG findings

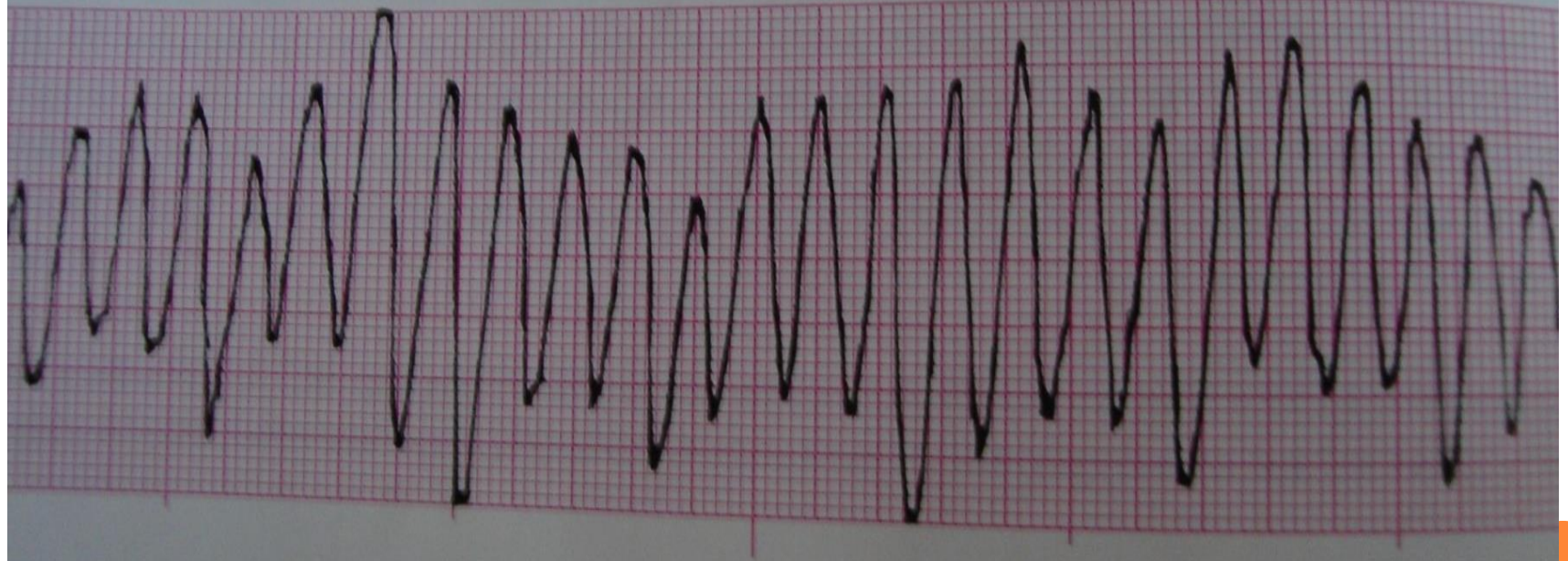
- Wide QRS complexes of changing amplitudes that appear to twist about the isoelectric line
- Ventricular rate 200-250 bpm
- Usually initiated by a long RR interval (like post PVC compensatory pause) followed by a short RR cycle
(e.g. R on T)

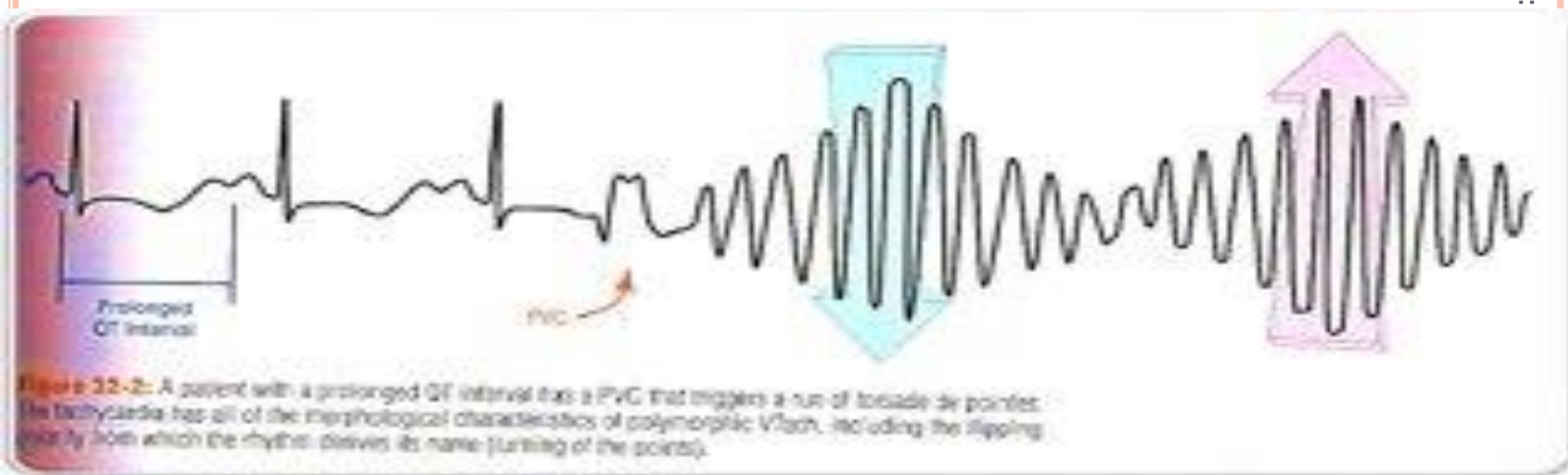


interval
S duration

None

Greater than 0.12 sec; gradual alteration in amplitude and direction of the QRS complexes





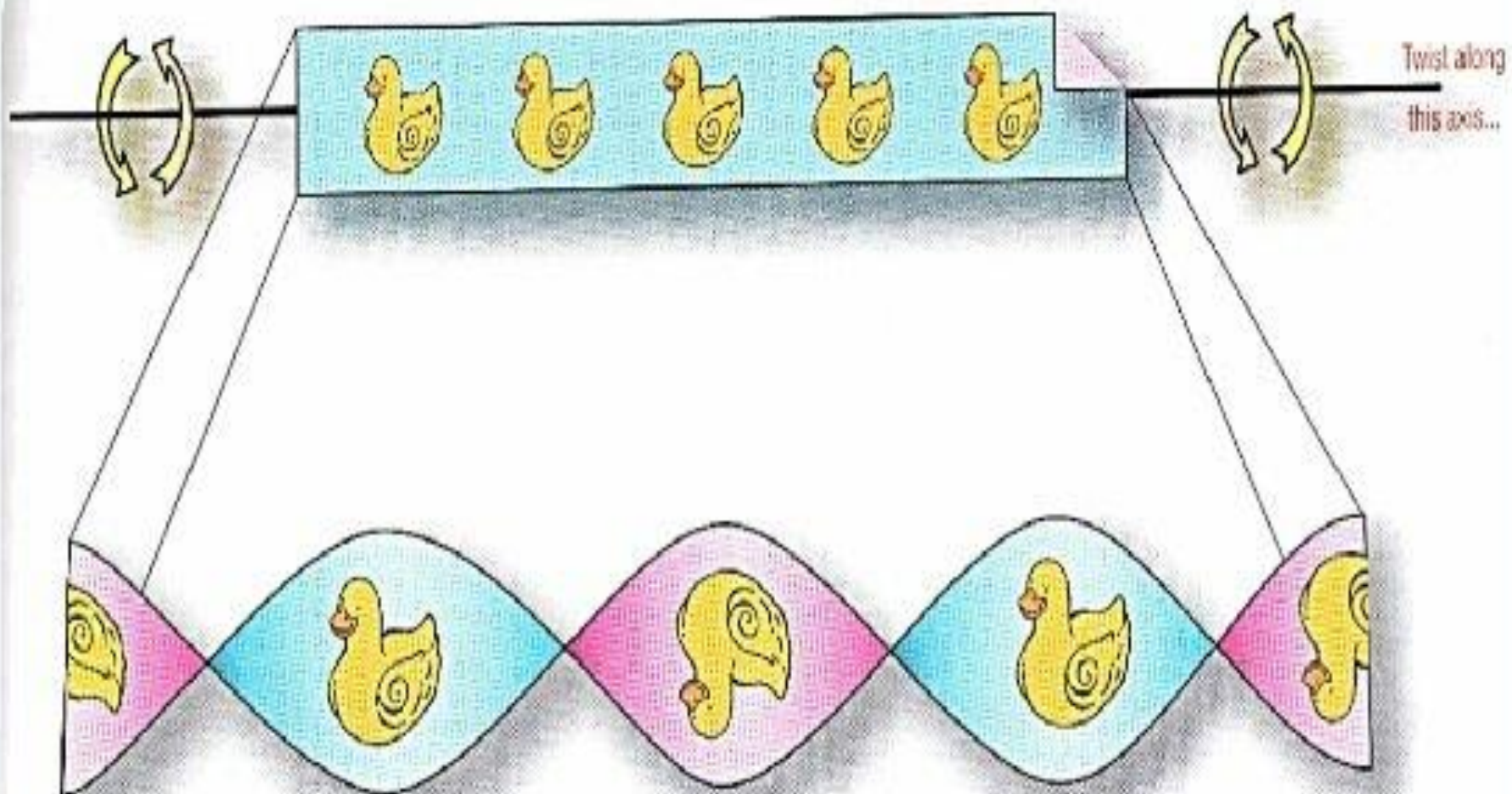


Figure 32-5: A party streamer with a different color on each side and an episode of uninterrupted VTach imprinted on it. If we were to take that streamer and twist it along a horizontal axis, we would create a spiral appearance with the two colors showing at regular intervals. In addition, the tracing would be upright in some sections and inverted in the others, depending on the length of the spiral.



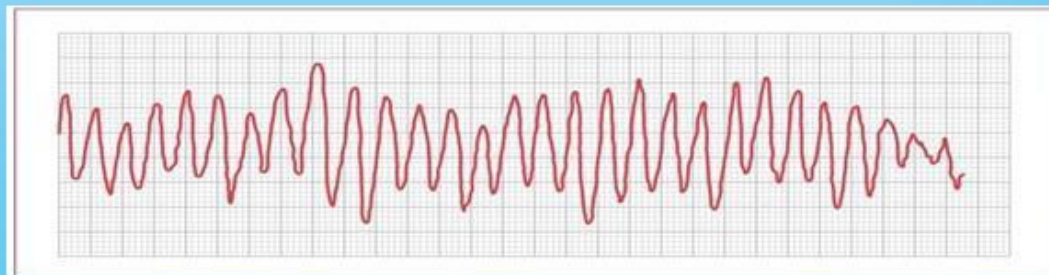
. Short coupled Torsades de Pointes (TdP).



Torsades de Pointes

⊙ Treatment

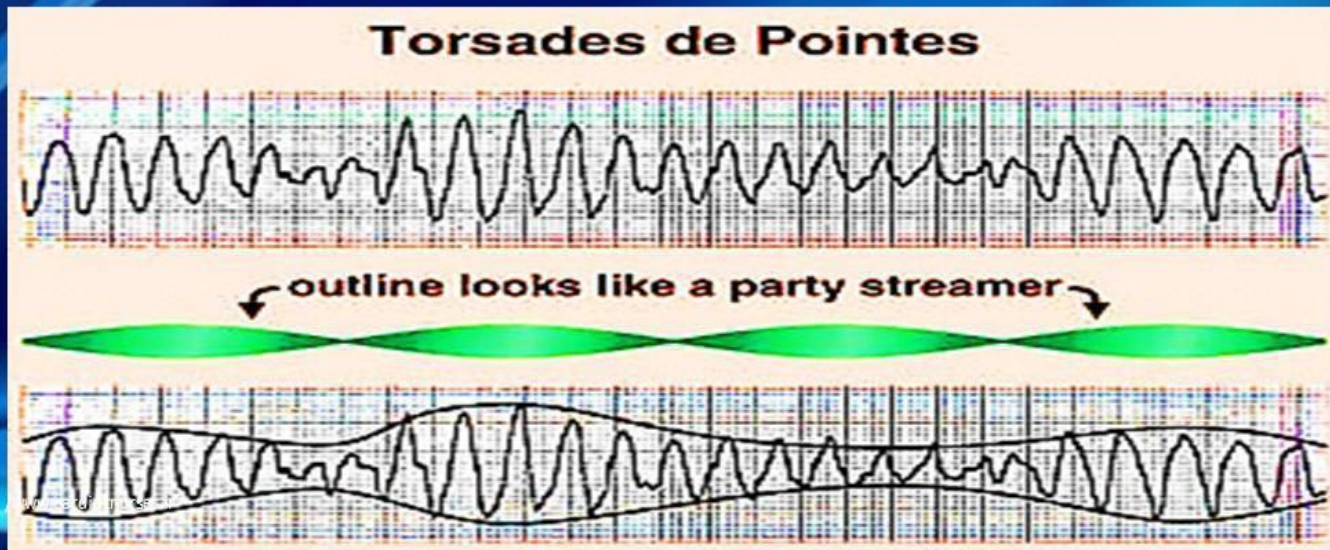
- Acquired: IV Magnesium + ventricular or atrial pacing
- Congenital: B-blockers
- Anti-arrhythmia drugs prolong the QT interval and worsen the arrhythmia



سولفات منیزیم

در ریتم تورساده بصورت IV ویا IO با دوز 1 الی 2 گرم رقیق شده در 10 سی سی دکستروز 5% بصورت تزریق آهسته استفاده می شود (کلاس IIb)

استفاده روتین از سولفات منیزیم در حین CPR توصیه نمی شود (کلاس III)



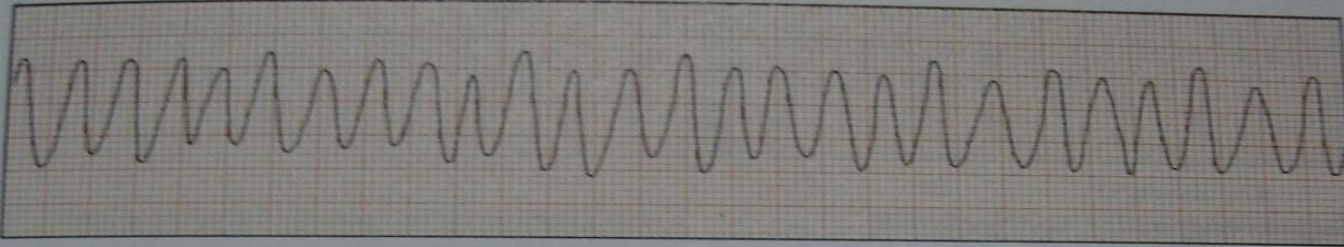
VENTRICULAR FLUTTER

cus firing at a rapid rate of 200 to 300 beats/minute. The hallmark of this arrhythmia is its smooth sine-wave appearance.

The illustrations shown here highlight key differences in the two arrhythmias.

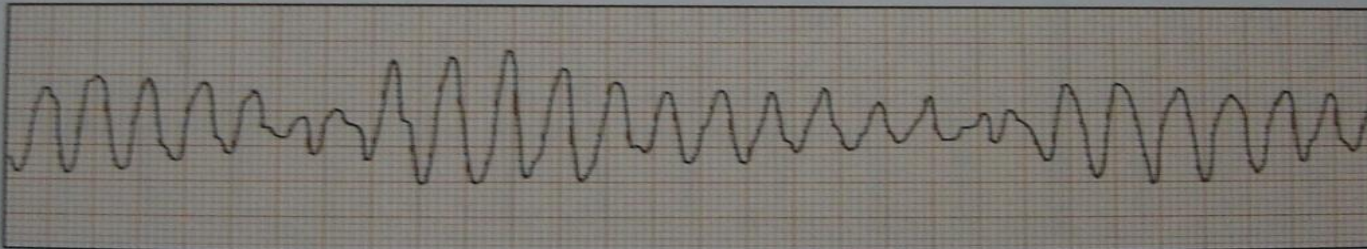
Ventricular flutter

- smooth, sine-wave appearance



Torsades de pointes

- spindle-shaped appearance



VENTRICULAR FIBRILLATION

Don't skip this strip

Identifying ventricular fibrillation

The first ECG strip shows coarse ventricular fibrillation; the second shows fine ventricular fibrillation.

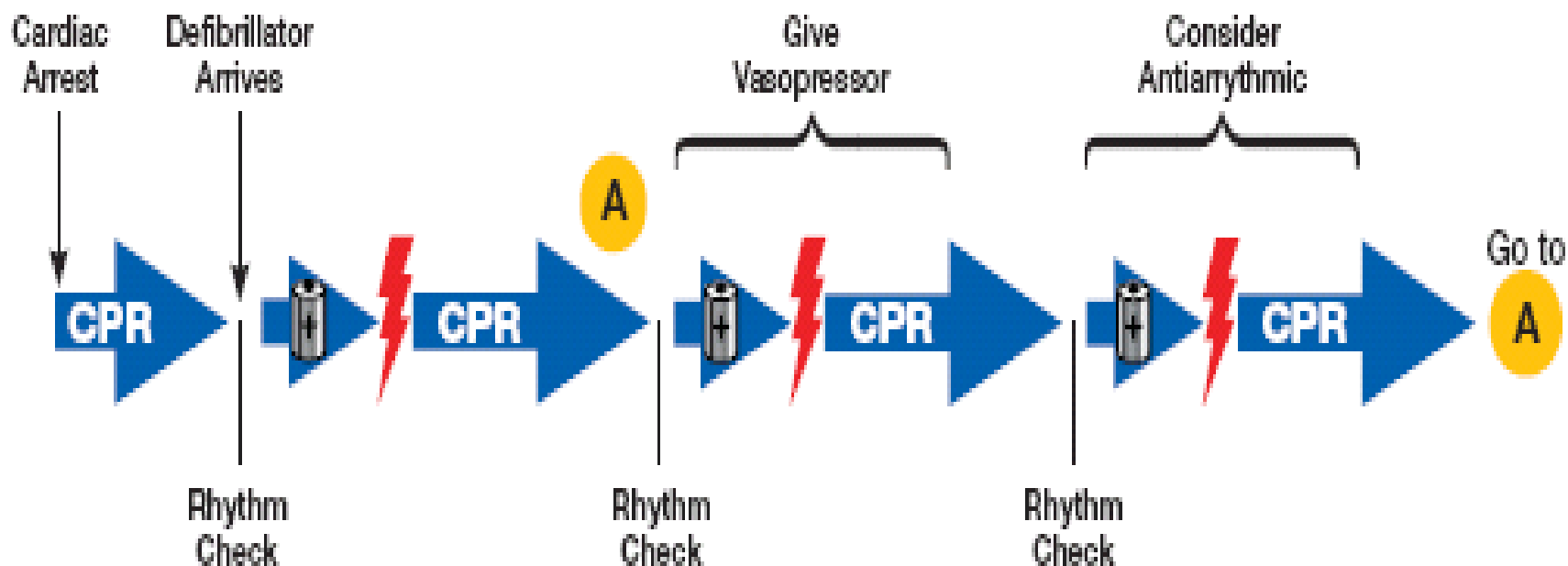
The presence of large fibrillatory waves indicates coarse ventricular fibrillation.

The presence of small fibrillatory waves indicates fine ventricular fibrillation.

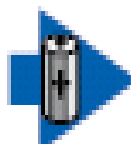
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VF, PULSELESS VT

Ventricular Fibrillation/Pulseless VT



= 5 cycles or
2 minutes of CPR



= CPR while
defibrillator charging



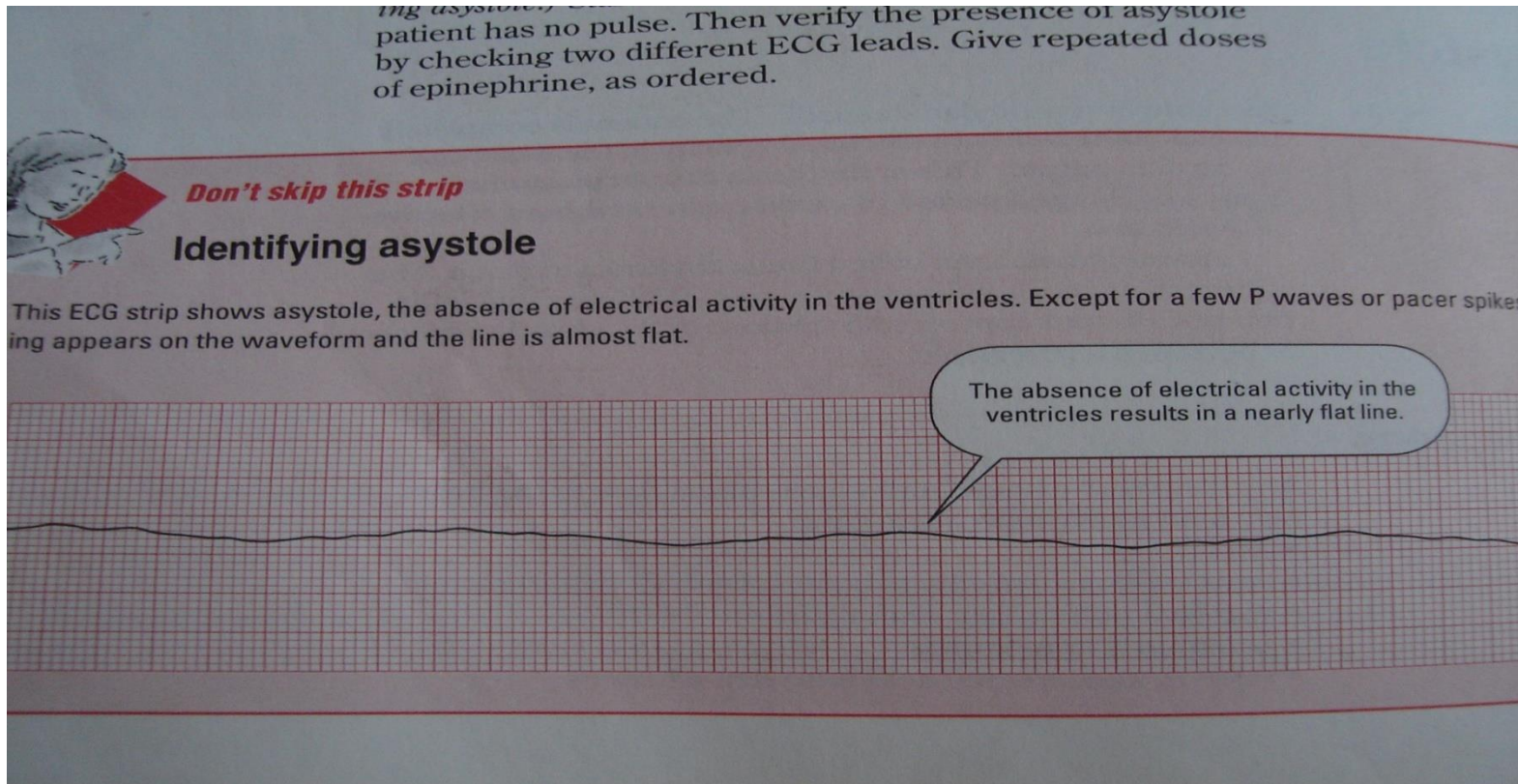
= Shock

NEW DEFIBRILLATOR ADVANCES

- Chest compression optimization devices

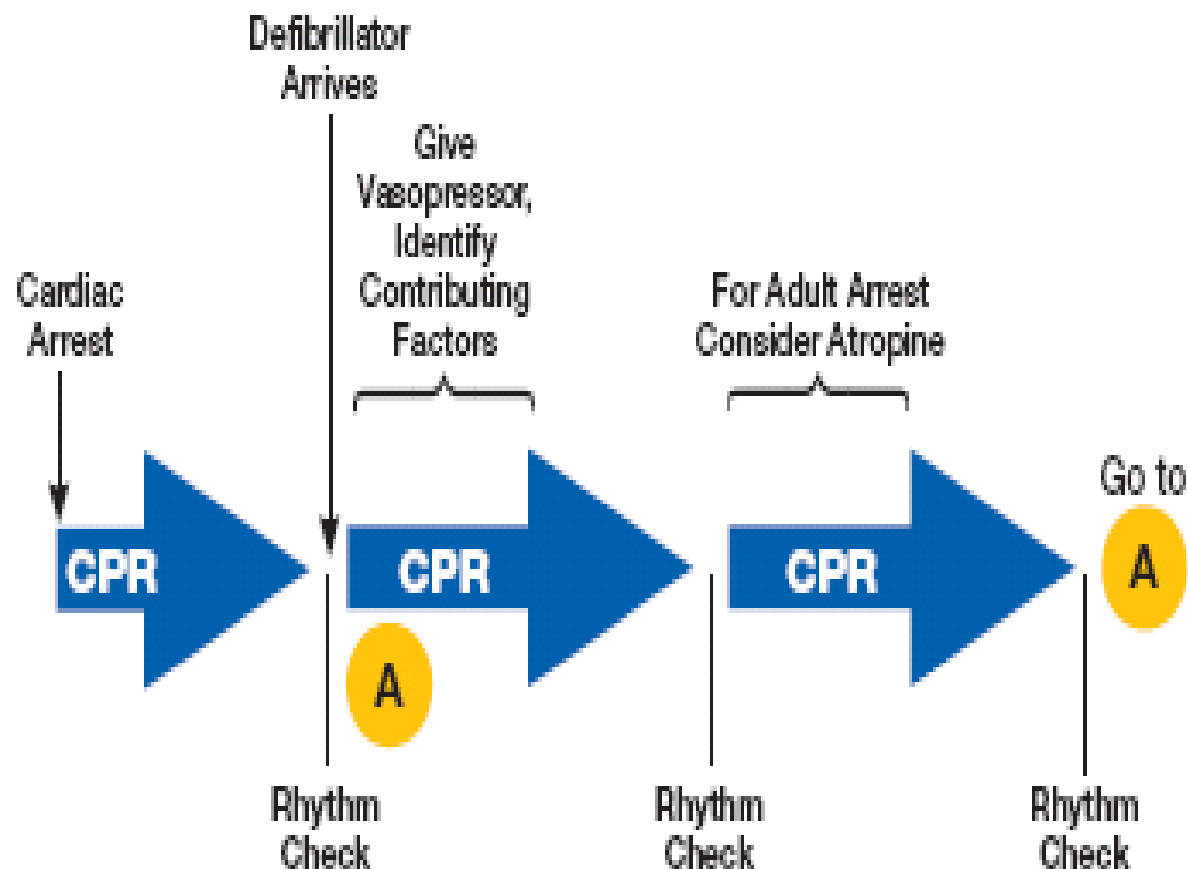


VENTRICULAR ASYSTOLE



ASYSTOLE, PEA

Asystole and Pulseless Electrical Activity



CPR = 5 cycles or 2 minutes of CPR

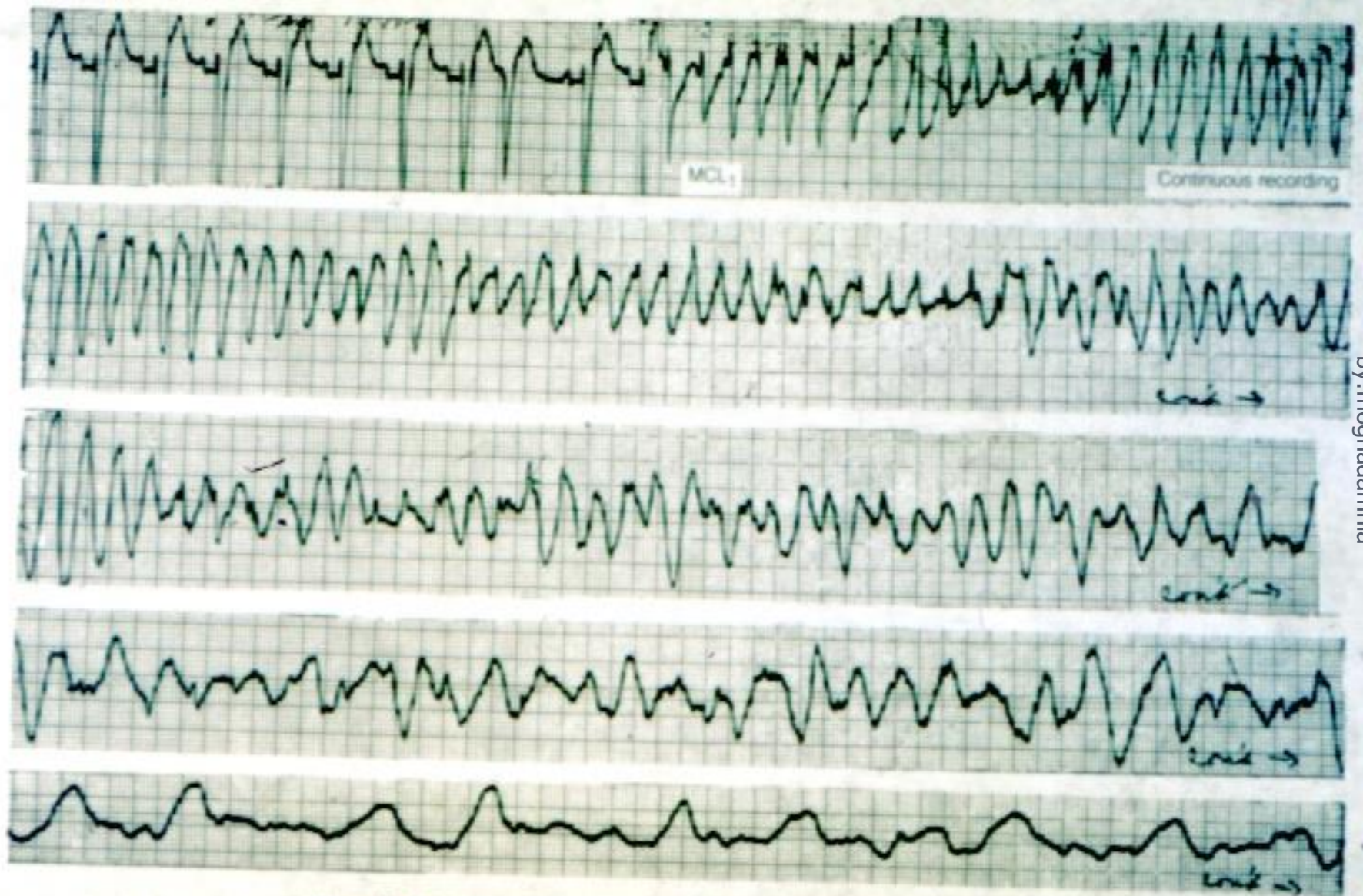


Figure 13-29. Continuously recorded lead MCL₁ rhythm strip from a patient admitted with acute myocardial infarction. Sinus rhythm is present at the beginning of the strip. A closely coupled ventricular depolarization (arrow) initiates a run of sustained polymorphic ventricular tachycardia which degenerates into ventricular fibrillation.

