

Student's Corner

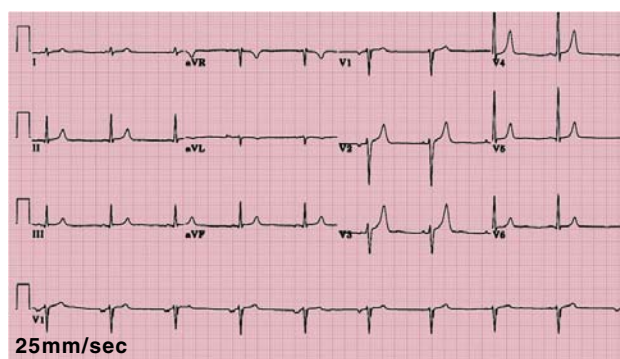
Become a Sherlock Holmes in ECG

M Chenniappan¹

Series 3 :

“Roaming but not Running”

Routine ECG of 55 years old diabetic and hypertensive



ECG of 55 years old diabetic and hypertensive

Questions :

1. Describe ECG changes
2. Why is this clue?
3. What are practical implications?

ECG Changes :

ECG shows Borderline bradycardia with varying P waves in Rhythm strip. The R-R interval shows slight variation. There are 3 different types of P waves indicating, the atrial pacemaker is shifting from one area to the other (Fig 1, arrows). In this situation, there are 2 differential diagnosis.

1. Wandering Atrial pacemaker
2. Multifocal atrial tachycardia.

In both of these situations, 3 different configuration of P waves have to be demonstrated as in our ECG. The only difference is the atrial rate. If the atrial rate is more than 100/mt. with at least 3 different configuration of P waves, it is Multifocal Atrial Tachycardia (MAT). If the HR is less than 100 with 3 different configuration of P waves it is called Wandering Atrial Pacemaker (WAP). The difference between MAT and WAP is shown in (Table 1)

- Wandering pacemaker is usually caused by varying vagal tone. With increased vagal tone the SA Node slows, allowing a pacemaker in the atria or AV Nodal area, which may briefly become slightly faster. After vagal tone decreases, the SA Node assumes its natural pace.

- A wandering atrial pacemaker, also termed multifocal atrial rhythm, is present when there are three or more ectopic foci within

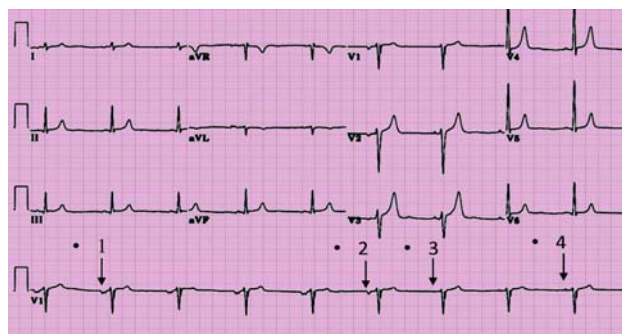


Fig 1 — ECG showing 4 different types of P waves with HR of about 60/mt

Table 1 — Differences between WAP and MAT

WAP	MAT
HR <100/min	HR >100/min
Vagal tone	Increased irritability
Mostly normal	Abnormal
No organic HT disease	Non cardiac diseases (COPD)
No TMT (Increase SR)	Amiodarone ; non DHP Ca. Blockers

the atrial myocardium that serve as the dominant pacemaker.

- Since they discharge in random fashion, the pacemaker location is continuously shifting and may be located anywhere in the atrial myocardium. As a result, there is a changing vector of atrial activation that causes a changing P wave morphology and PR interval duration.

- A dominant P wave (sinus or atrial) cannot be identified.
- The rate is less than 100 beats per minute.

The Clue :

Because atrial depolarization (P) is roaming or wandering inside atrium (WAP) and not running (not >100/mt.) like MAT the clue of “Roaming but not Running” is given.

Practical Implications :

- A Benign condition generally has no clinical significance.
- It is often an expression of high vagal tone.
- Usually transient.
- Can be unmasked by beta or calcium blockers.
- Severe forms of wandering pace maker can be a marker of sinus node dysfunction and would need further evaluation
 - In the coronary care units, it is associated with infero-posterior MI when the vagal fibers are insulted.
 - This attractive and descriptive ECG entity is largely insignificant in clinical cardiology.
 - It should not be confused with more dangerous cardiac arrhythmia like sinus pauses and arrest and treated wrongly.

¹Adjunct Professor, Dr MGR Medical University, Tamilnadu; Senior consultant cardiologist, Tamilnadu; Ramakrishna Medical Centre, Apollo Speciality Hospital, Trichy