

ORIGINAL ARTICLE

## Phantasmagoria of an ECG aberration in a young male with palpitations: The answer lies within

Aditya Kapoor<sup>1</sup>, Ankit Kumar Sahu<sup>2,\*</sup>

<sup>1,2</sup>Department of Cardiology, Sanjay Gandhi postgraduate institute of medical sciences (SGPGIMS), Lucknow, Uttar Pradesh, India

**\*Corresponding author:** Ankit Kumar Sahu, Assistant Professor, Department of Cardiology, Sanjay Gandhi postgraduate institute of medical sciences (SGPGIMS), Lucknow, Uttar Pradesh, India. Email: ankitsahu.md@gmail.com

Received: 22 July 2020; Accepted: 02 January 2021; Published: 14 March 2021

### Abstract

We herein describe an inquisitive electrocardiographic finding encountered during treadmill testing which could have led to disastrous erroneous actions had it not been recognized timely in an ingenious manner. The need to promptly identify such veiled observations is of utmost importance as it can affect the outcomes in an undesirable way. Careful scrutiny of such information should always be matched with accompanying clinical scenario for optimal results.

**Keywords:** supraventricular tachycardia, electrocardiogram, telemetric artifact

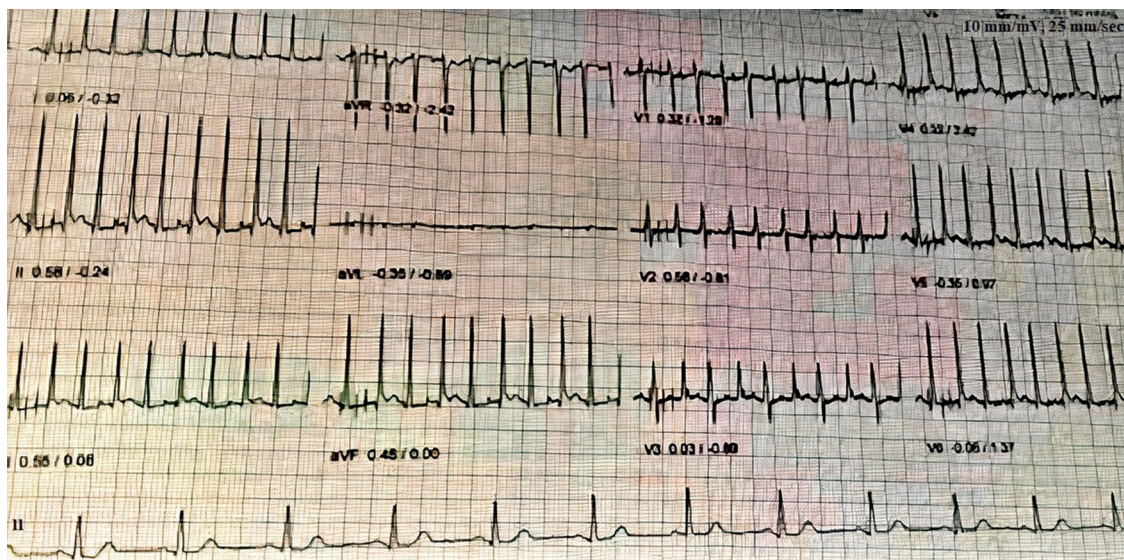
### Case

A quadragenarian male presented with recent onset recurrent palpitations and atypical chest pain. Physical examination, 12-lead electrocardiogram (ECG) and echocardiographic evaluation were within normal limits. He underwent a treadmill exercise test (TMT) to look for inducible ischemic ST-T changes and also to look for concealed accessory pathway recruitment. Resting surface ECG measurements taken during stress testing protocol seemed apparently abnormal (Figure 1). Identify the peculiar pattern and possible underlying mechanism?

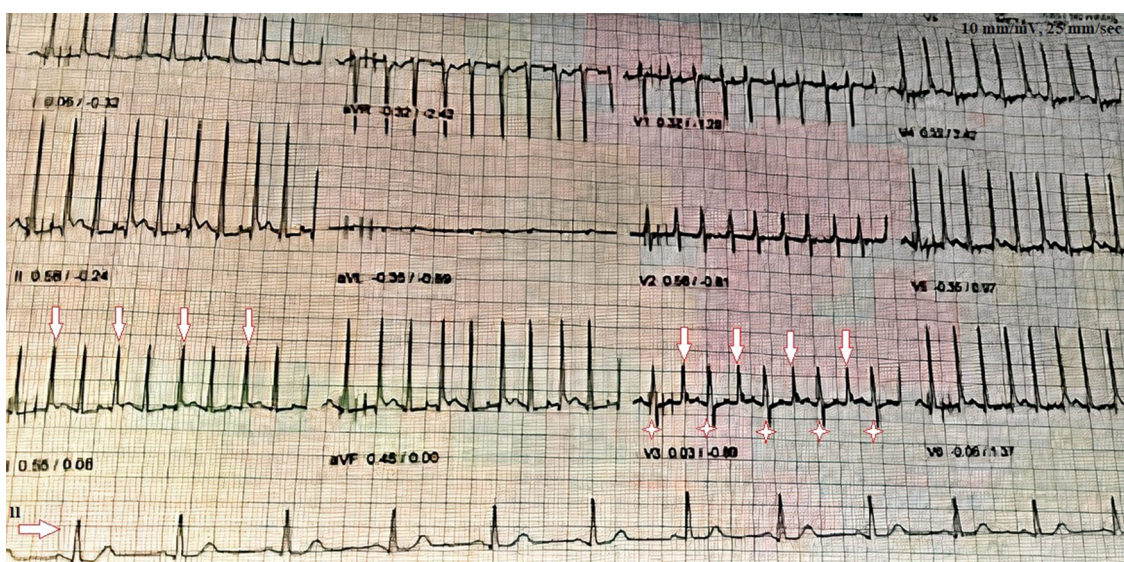
- Supraventricular tachycardia
- Pre-excitation syndrome with atrial fibrillation
- Electro-physiologically normal ECG
- Insufficient data to comment upon

### Explanation

The correct answer is option 3 (Electro-physiologically normal ECG). A transit sweep over the limb and precordial leads gives an erroneous impression of narrow QRS-complex tachycardia with a ventricular rate of 180/min. R-R intervals also seem to be slightly irregular. However, precordial lead V<sub>3</sub> demonstrates varying morphologies with alternating biphasic and positive complexes that do not conform to either right or left bundle branch conduction defects. The complexes marked by down arrows do not have a preceding P-wave or following T-wave (Figure 2). In fact, these are the telemetric artifacts related to linked median rhythms often caused by motion artifacts, muscle hypertrophy or electromagnetic interference during treadmill testing.<sup>1</sup> Gating or motion artifacts often get amplified in the tracings which may



**Figure 1** 12 lead ECG.



**Figure 2** 12 lead ECG showing telemetric artifacts mimicking as QRS complexes (downward arrows), rhythm strip showing normal rate, rhythm and morphology (rightward arrow) and native QRS complexes (starred).

lead to fallacious interpretation resulting in flawed management.<sup>2,3</sup> To appreciate the above-proposed mechanism, one could make a note of the bottom raw rhythm ECG strip (rightward arrow) that shows a perfectly normal rate, rhythm and morphology.

TMT was accomplished which showed no evidence of inducible ischemia or a concealed accessory

pathway. He was recommended an external loop recorder for further evaluation of his symptoms.

### Conclusion (teaching point)

Hence, one should always keep pseudo-arrhythmic artefacts erroneously formed by computer

synthesized median complexes in mind while making key decisions regarding potentially critical conditions.

## Disclosure statement

There are no relationships/conditions/circumstances that may present as a potential financial or intellectual conflict of interest with respect to the authors.

## Statement of authorship

1. Conceived the basic idea for the study and actively participated in the interpretation and approval of the manuscript.
2. Collected the relevant data, prepared the draft of the manuscript.

All the authors take responsibility for all aspects of the reliability and freedom from bias of the data presented and their discussed interpretation.

## References

1. Srinivas SK, Hirapur IS, Bhairappa S, Manjunath CN. A false positive ST segment elevation during exercise stress test. *BMJ Case Rep* 2013 [Published online 16 April 2013] doi:10.1136/bcr-2013-009199
2. Ma'quez MF, Colin L, Guevara M, Iurralde P, Hermosillo AG. Common electrocardiographic artifacts mimicking arrhythmias in ambulatory monitoring. *Am Heart J* 2002; 144:187–97.
3. Patel SI, Souter MJ. Equipment-related electrocardiographic artifacts: causes, characteristics, consequences and correction. *Anesthesiology* 2008; 108(1):138–148.