



RHYTHM PUZZLE ANSWER

Positive exercise test?

W. K. den Dekker¹ · J. W. Deckers¹ · S. C. Yap¹

Published online: 21 July 2016

© The Author(s) 2016. This article is available at SpringerLink with Open Access

Answer

The ECG during peak exercise shows sinus tachycardia of 167 beats/min with pre-excitation and ischaemic-like ST-segment depression in V3–V6 (Fig. 1a in the Question). The ECG in the recovery phase shows disappearance of pre-excitation with normalisation of ST segments at a heart rate of 145 beats/min (Fig. 1b in the Question). Pre-excitation reoccurred at a heart rate of 101 beats/min. The baseline ECG more clearly shows pre-excitation consistent with a posteroseptal accessory pathway (Fig. 1). The observation that pre-excitation was still present at peak exercise can be explained by improvement in the anterograde conduction of the accessory pathway during higher adrenergic activity during exercise. The exercise test was regarded inconclusive for the presence of ischaemia.

False-positive ST-segment depression during exercise testing occurs in half of patients with pre-excitation [1, 2]. Nuclear stress perfusion imaging has been proposed as an alternative for ischaemia detection, but this has also been associated with false-positive results [2]. The mechanism of perfusion defects in patients with pre-excitation could be the result of ventricular asynchrony leading to differences in perfusion. Our patient was considered at low risk for significant coronary artery disease, considering his age, absence of risk factors and excellent exercise capacity without ischaemic symptoms.

The guidelines consider abrupt loss of pre-excitation during exercise testing useful to identify patients at low risk of rapid conduction over the accessory pathway, and thus at low risk for sudden arrhythmic death [3]. Our patient showed abrupt loss of pre-excitation during the recovery phase (Fig. 2). In consideration of the patient's symptomatic presentation, he was offered an electrophysiology study, which will be performed soon.

Open Access This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

References

1. Jezior MR, Kent SM, Atwood J. Exercise testing in Wolff-Parkinson-White syndrome: case report with ECG and literature review. *Chest*. 2005;127:1454–7.
2. Paquet N, Verreault J, Lepage S, et al. False-positive 201thallium study in Wolff-Parkinson-White syndrome. *Can J Cardiol*. 1996;12:499–502.
3. Page RL, Joglar JA, Caldwell MA, et al. ACC/AHA/HRS Guideline for the Management of Adult Patients With Supraventricular Tachycardia. 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*. 2016;67(13):e27–e115. doi:10.1016/j.jacc.2015.08.856.

✉ W. K. den Dekker
w.dendekker@erasmusmc.nl

¹ Department of cardiology, Thoraxcenter, ErasmusMedical Center, Rotterdam, The Netherlands





Fig. 1 Baseline ECG



Fig. 2 Sudden loss of pre-excitation