



Pseudoelectrical alternans during supraventricular tachycardia



Hesham R. Omar ^{a,*}, Enrico M. Camporesi ^b

^a Internal Medicine Department, Mercy Medical Center, Clinton, Iowa, USA

^b University of South Florida, FGTA and TEAMHealth, Tampa, FL, USA

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ABSTRACT

We present a case of pseudoelectrical alternans occurring during supraventricular tachycardia.

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1. Case presentation

A 32-year-old-woman experienced sudden onset of rapid regular palpitations during which she was short of breath and sweaty. She had attempted Valsalva maneuver without abortion of the arrhythmia which lasted for 20 min and prompted her to come to the emergency department for further evaluation. She has been having similar episodes of palpitations over the previous 2 years but has been occurring in increasing frequency the 3 months prior to her presentation but they would last no longer than 3 min and resolve with Valsalva maneuvers. She had not sought medical advice for these episodes. She was a non-smoker, did not consume alcohol, caffeinated products, energy drinks, illicit drugs and had no family history of similar cardiac arrhythmias. Her electrocardiogram (ECG) showed supraventricular tachycardia (SVT), rate 200/min with variation in the amplitude of QRS complex mimicking electrical alternans (Fig. 1, panel a). After failure of 6 mg of adenosine, 12 mg of adenosine was given followed by termination of SVT and disappearance of electrical alternans (Fig. 1, panel b). Echocardiogram revealed no pericardial effusion and no structural heart disease.

2. What is the diagnosis? Pseudoelectrical alternans

The case presented herein shows beat-to-beat variation in QRS amplitude in absence of pericardial effusion in a patient with SVT exemplifying the phenomenon of pseudo-electrical alternans. Electrical alternans disappeared once the arrhythmia was aborted. Although electrical alternans has traditionally been regarded as a sign that raises concern for cardiac tamponade due to pendular rotation of the heart in the fluid-filled pericardium, its sensitivity in detecting pericardial tamponade is low [1] rendering the 12-lead-ECG a poor diagnostic tool. Electrical alternans can also be encountered in other pathologies due to alternation of ventricular depolarization as during myocardial ischemia or fast SVT and is then referred to as “pseudoelectrical alternans” whenever what appears to be electrical alternans is not caused by large pericardial effusion. The mechanism of pseudoelectrical alternans during narrow complex SVT is not very clear and has been attributed to nonspecific intraventricular conduction abnormalities or rocking heart [2]. Generally, the presence of pseudoelectrical alternans during SVT has been considered to be suggestive of AV re-entrant tachycardia (AVRT) (pseudoelectrical alternans is more commonly a function of the heart rate rather than the mechanism of the SVT, and AVRT is generally faster than other forms of SVT), however, it may also occur during AV nodal re-entrant tachycardia (AVNRT). Notice in the presented case, the beat to beat variation in RR interval during SVT (alternating cycles of 294 and 319 ms in panel a). SVT with alternating cycle length occurs more commonly in orthodromic AVRT with alternating antegrade conduction over a slow and fast AV nodal pathway, however, atrial tachycardia with similar alternating conduction and AVNRT with conduction

* Corresponding author. Internal Medicine Department, Mercy Medical Center, 1410 N. 4th Street, Clinton, IA, 52732, USA.

E-mail address: hesham.omar@apogeephysicians.com (H.R. Omar).

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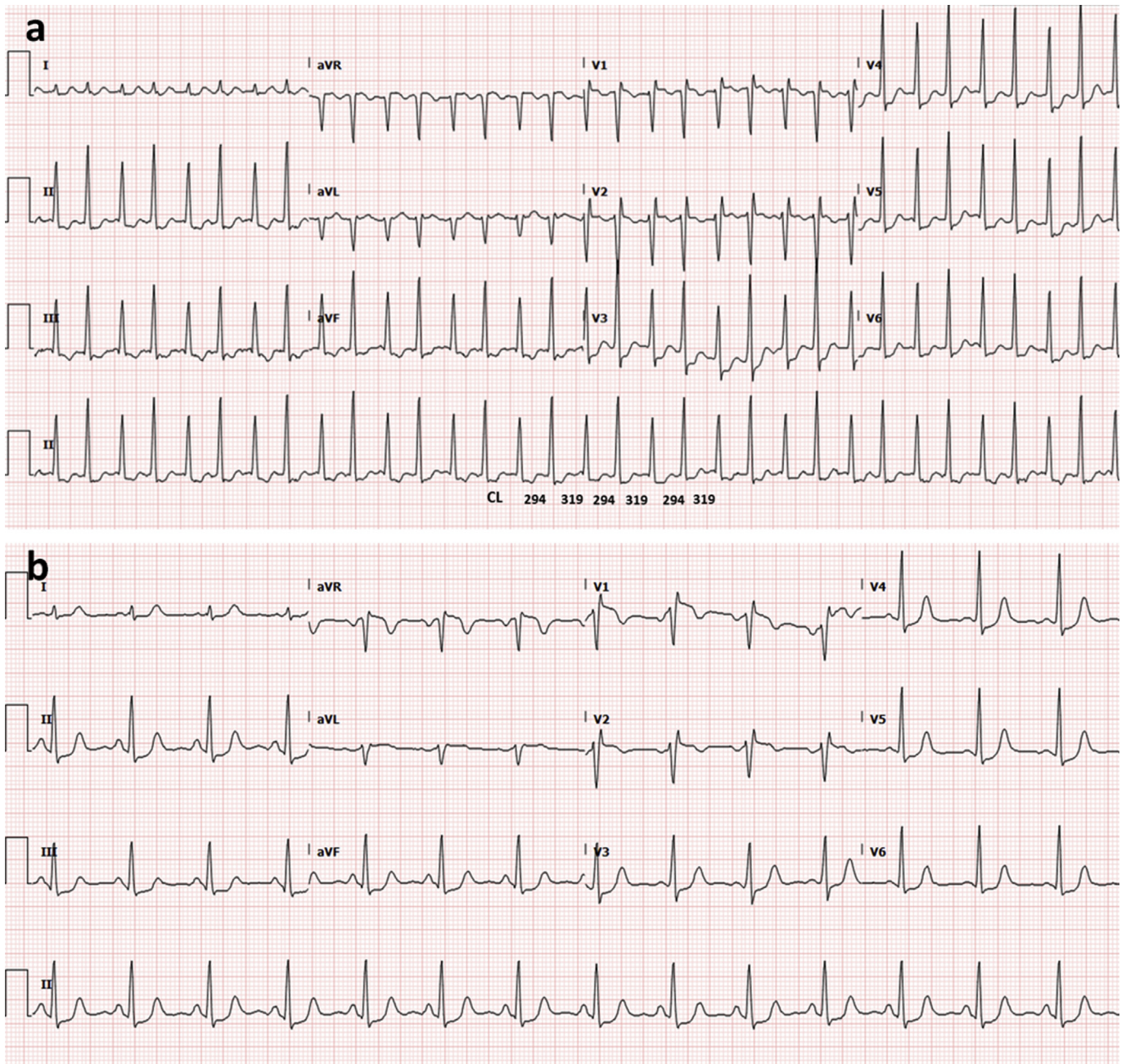


Fig. 1. (a) 12-lead ECG showing supraventricular tachycardia with alternating variation in the amplitude of QRS mimicking electrical alternans. Notice the beat to beat variation in RR interval with alternating cycles of 294 and 319 ms CL: cycle length. (b) 12-lead ECG after adenosine showing restoration of normal sinus rhythm and disappearance of electrical alternans.

alternating over two distinct antegrade slow AV nodal and single fast pathways has been reported [3]. Electrophysiological study is needed to confirm the mechanism of this arrhythmia.

Disclosure statement

All authors have nothing to disclose.

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