Global pseudo-atrial flutter ECG appearance secondary to unilateral parkinsonian tremor

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DESCRIPTION

An 82-year-old man with previous bioprosthetic aortic valve replacement for aortic stenosis had a routine ECG (figure 1). This was thought to represent an atrial tachycardia with cycle length 280 ms and 3:1 atrioventricular response. A diagnosis of atrial flutter was made based on tachycardia cycle length, p-wave morphology and previous cardiac surgery. He had a mild left-sided tremor in keeping with known Parkinson's disease. The patient was anticoagulated and admitted electively for an electrophysiology (EP) study. In the EP laboratory, the patient had a 12-lead ECG (figure 2A) showing sinus rhythm with a ventricular rate of 60 bpm.

Figure 2B shows the EP electrogram recorded in the coronary sinus confirming sinus rhythm. However, it was noted that the 'flutter waves' in the original ECG were most marked in the left limb leads. In the EP laboratory, ECG labels are placed on the torso, as opposed to the limbs. After moving ECG labels to the forearms, the surface ECG is shown (figure 3) with re-emergence of 'flutter' waves. A diagnosis of pseudo-atrial flutter was made.

Parkinsonian tremor characterised by a 5 Hz upper-limb dyskinesia can result in a pseudo p-wave artefact on ECG at a rate of 300 bpm, mimicking atrial flutter.^{1 2} However, pseudo p-waves are usually only seen in the limb leads. We

Figure 1 Twelve-lead ECG showing apparent atrial tachycardia with atrial rate of 200/min, leftward axis deviation and ventricular rate of 55 bpm.

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Figure 2 (A) Twelve-lead ECG performed in EP laboratory showing normal sinus rhythm with first-degree heart block, left axis deviation and ventricular rate of 60 bpm. (B) EP CardioLab (GE Healthcare) printout during EP study showing surface ECG on top, and corresponding coronary sinus electrogram below. Surface ECG p-wave and QRS correspond to electrogram A-wave and V-wave, respectively. This confirms sinus rhythm.

Figure 3 Twelve-lead ECG repeated. On moving limb leads from torso to limbs, pseudo-flutter waves reappear globally on surface ECG.

demonstrate that tremor-induced flutter waves can result in global p-wave changes in left-sided tremor. This may be

because, predominantly, the left limbs form the negative composite pole of the precordial ECG waveform, and hence left-sided tremors would alter its morphology.³

Learning points

- ▶ Pseudo-atrial flutter secondary to parkinsonian tremor can present with precordial flutter waves, and not exclusively in limb leads.
- ▶ This finding highlights the importance of ECG interpretation within the clinical context.
- ▶ Always consider movement artefact in ECG diagnosis of atrial tachycardias to avoid incorrect diagnosis and subsequent unnecessary treatment.

Competing interests None declared.

Patient consent Obtained.

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