An irregular atrial tachycardia

What is the underlying mechanism?

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Answer

There are clearly visible *P*-waves in most of the leads (Fig. 1). The *P*-waves are negative in leads DII, DIII and aVF. Hence, this is not a sinus rhythm. All the *P*-waves have the same morphology, constant PP interval at a rate of 210 beats per minute (bpm), with an isoelectric baseline between them. Therefore, the underlying rhythm is unifocal atrial tachycardia [1].

Lead DII shows 12 *P*-waves, but some of these waves are barely discernible because they are superimposed on the QRS-T complexes (Fig. 2). In the first part of the strip there are *P*-waves alternately conducted and non-conducted to the ventricles, characterising a 2:1 AV conduction. In the middle half of the strip there is a longer RR interval where only the ninth *P*-wave conducts to the ventricles, while the seventh, eighth and tenth *P*-waves are blocked, realising a 4:1 AV conduction. So, the atrial tachycardia presents an alternating 2:1 and 4:1 AV conduction. The long RR interval is less than twice the short RR intervals and the PR intervals progressively lengthen until a pause

with 3 non-conducted *P*-waves occurs. These elements are consistent with alternating Wenckebach periodicity, a rare phenomenon characterised by a block in two levels of the atrioventricular node; one proximally, giving rise to a 2:1 block and one distally, responsible for the Wenckebach periodicity that explains the progressive PR lengthening until the non-conducted *P*-wave [2]. Alternating Wenckebach periodicity is encountered primarily in atrial tachyarrhythmias; the most frequent block level is the atrioventricular node, but it has been described in almost every level of the conduction pathways, including accessory ones [3].

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References

1. Page RL, Joglar JA, Caldwell MA, et al. ACC/AHA/HRS guideline for the management of adult patients with supraventricular tachycardia. *Circulation*. 2016;133(14):e506–74.
2. Oreto G. In: I disordini del ritmo cardiaco. Torino: Centro Scientifico Editore; 1997. pp. 242–3.
3. Castellanos A, Sung RJ, Aldrich JL, et al. Alternating Wenckebach periods occurring in the atria, His-Purkinje system, ventricles and Kent bundle. *Am J Cardiol*. 1977;40:853–9.

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Fig. 1 The irregular atrial tachycardia

Fig. 2 The alternating Wenckebach phenomenon visible on the DII lead (see text for discussion) (A atria, AVN atrioventricular node, P proximal block, D distal block, V ventricles, 1–12 P-waves)

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