

# Simultaneous associated onset of atrial fibrillation and ventricular tachycardia without structural cardiopathy - A case report

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## Abstract

Onset of fast ventricular tachycardia after spontaneous termination of atrial fibrillation is unusual and the mechanism is not well known. There are few case reports in the literature and the authors did not find the physiopathological points of this entity. Hereby we present a 73-year-old man with atrial fibrillation with short periods of non-sustained ventricular tachycardia treated with amiodarone effectively. Coronary angiography, an ergometry as well as an echocardiogram were realized to complete the study showing any disturbs.

## Case report

A 73-year-old man with a history of hypertension, and obstructive sleep apnea syndrome was admitted in our emergency department due to oppressive chest pain and general discomfort. He denied loss of consciousness after the event or other symptoms. At home, an electrocardiogram was performed revealing short periods of non-sustained ventricular tachycardia (NSVT). Due to that, it was started treatment with amiodarone (300 mg endovenous in bolus).

On physical examination, it was revealed arrhythmic heart tones without pulmonary or abdominal disturbs. A new electrocardiogram was performed revealing an unknown atrial fibrillation (AF) with short periods of NSVT (Figure 1). To complete the study, a blood test was performed revealing any disturbs (including ultra-sensitive cardiac troponins). A chest x-ray was also realized showing any disturbs. Attending to these results, amiodarone treatment (600 mg endovenous in 250 cc of glucose 5% infusion, 21 ml/h) was initiated decreasing VT episodes (Figure 2). The patient was transferred to the intensive care unit for control during 24h discharging after that to Cardiology unit with an electrocardiogram in sinus rhythm with left anterior fascicular block and first grade block (like previously) (Figure 3). During this process, a coronary angiography, an ergometry as well as an echocardiogram were realized showing any disturbs. After two weeks of cardiac monitoring without new episodes of VT or AF, the patient was discharged.

## Discussion

AF is an entity characterized by rapid and irregular RR intervals. Onset of fast VT after spontaneous termination of AF is unusual and the mechanism is not well known [1]. Idiopathic left VT is

probably based on a re-entrant mechanism, and right ventricular outflow tract tachycardia could be due to triggered activity or abnormal automaticity [2]. To explain VT periods during AF, authors have been suggested different theories. A long-short RR interval sequence during AF could create unidirectional block and start re-entry. Long preceding RR intervals have been noted in 77% of cases with "repetitive monomorphic VT and a structurally normal heart" [3]. This theory may be the cause of our case report due to the absence of structural heart diseases. On the other hand, it has been observed that irregular RR intervals during AF could lead to rapid escalation of the pause dependent after depolarisations above a critical threshold initiating VT. In addition, overdrive excitation during AF could lead to Ca<sup>2+</sup> overloading and abnormal automaticity [2].

This rare entity of AF with onset of VT has been related with some diseases, including Left ventricular noncompaction and Brugada syndrome [4], hypertrophic cardiomyopathy [5], and myotonic dystrophy [6]. To improve the knowledge of this unusual pathology, more studies are required in the future to explain the physiopathological aspects. Until that moment, avoiding the episodes of AF may reduce the number of VT episodes, particularly, in patients with severe left ventricular impairment.

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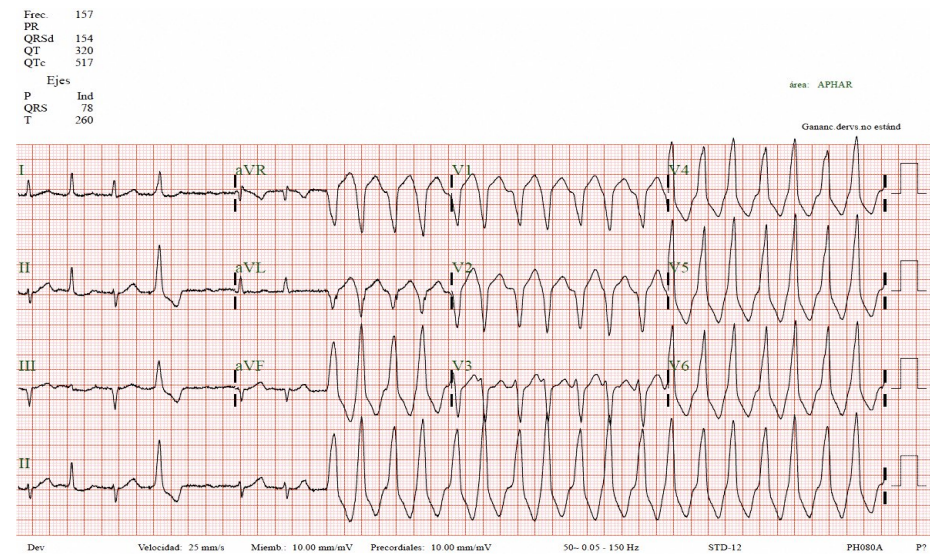


Figure 1. Electrocardiogram revealing an unknown atrial fibrillation with short periods of non-sustained ventricular tachycardia

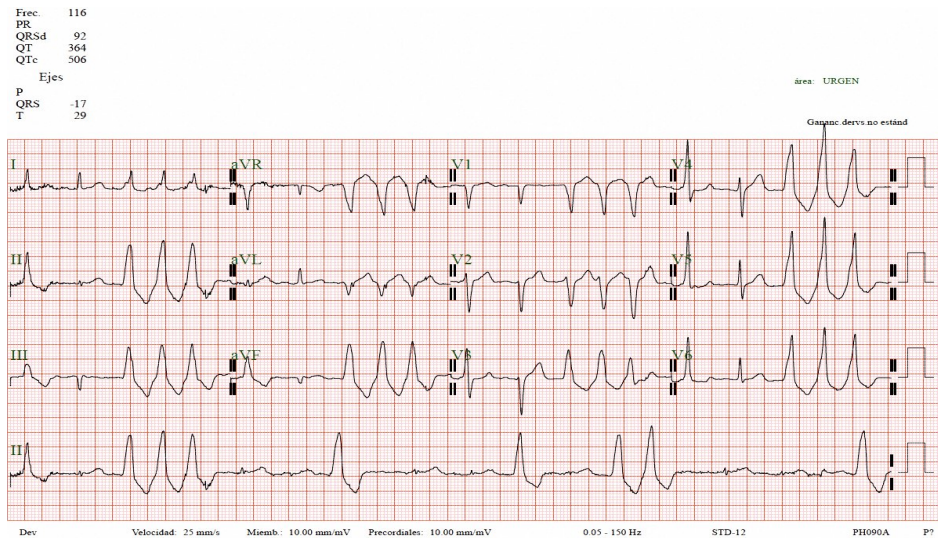


Figure 2. Electrocardiogram after the beginning of amiodarone treatment revealing atrial fibrillation with short periods of non-sustained ventricular tachycardia. A decrease of ventricular tachycardia episodes may be observed

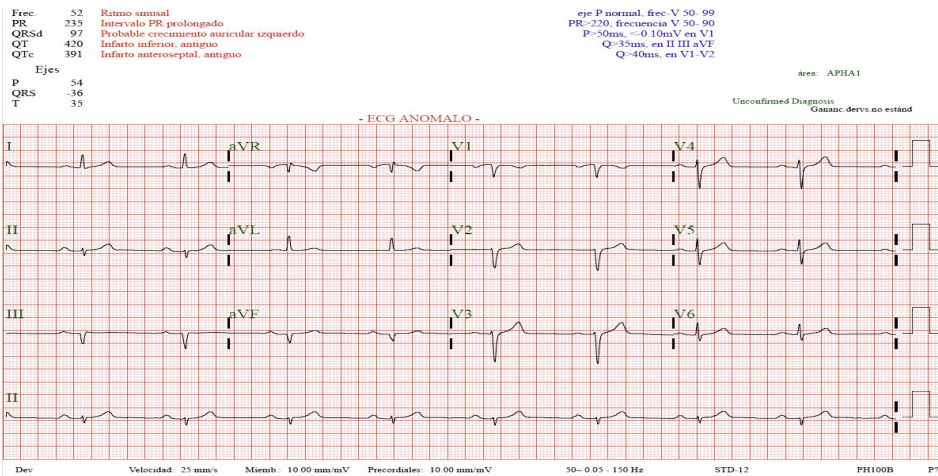


Figure 3. Electrocardiogram in sinus rhythm with left anterior fascicular block and first grade block

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