# What is the Diagnosis?

CASE PRESENTATION

Patient OG, 62 years, with arrhythmogenic cardiomyopathy in the right ventricle and low-tolerated sustained tachycardia, user of an implantable ventricular single-chamber cardiovascular defibrillator (ICD), returned asymptomatic for routine evaluation. There was no registry of sustained arrhythmia, and the limits of stimulation and sensitivity were checked and were appropriate (Fig. 1). However, facing the device's telemetry, it was detected lack of sensitivity in a ventricular extra-systole (Fig. 2).

This way, facing the possibility that this flaw could generate failure of detection of a slow ventricular tachycardia (Fig. 3), the level of sensitivity regarding ICD was improved, with the correction of the failure in the extra-systole intermittent sensitivity.
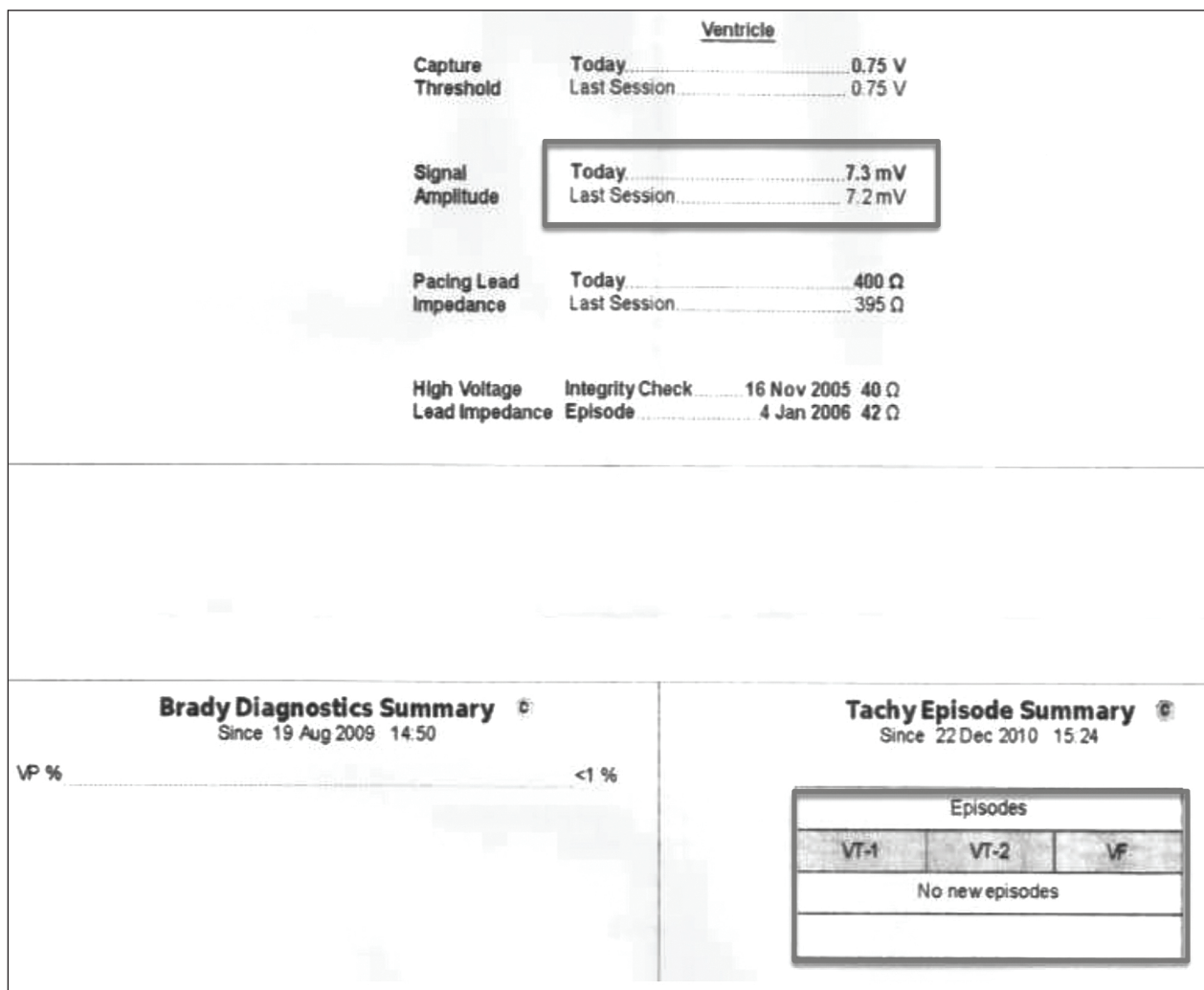
Figure 1. Electrophysiological measurements of the cardioverter defibrillator in the initial assessment and absence of documented ventricular arrhythmias.
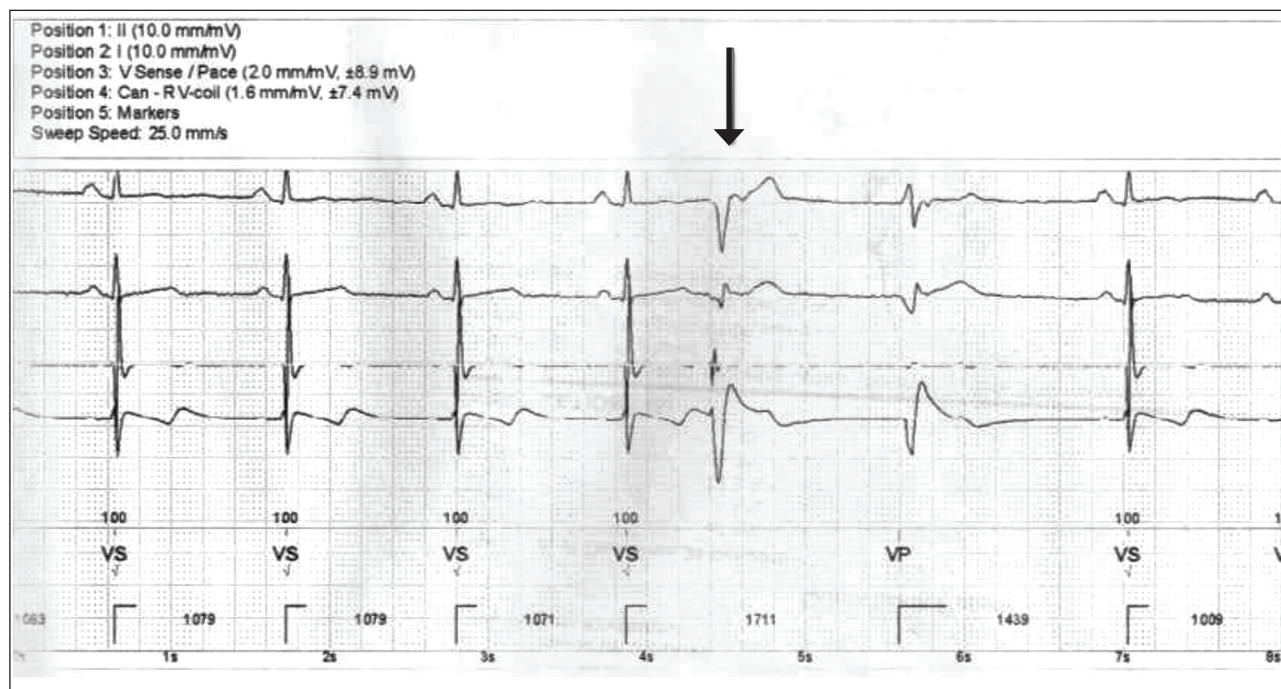
Figure 2. Ventricular extrasystole sensitivity failure during telemetry.
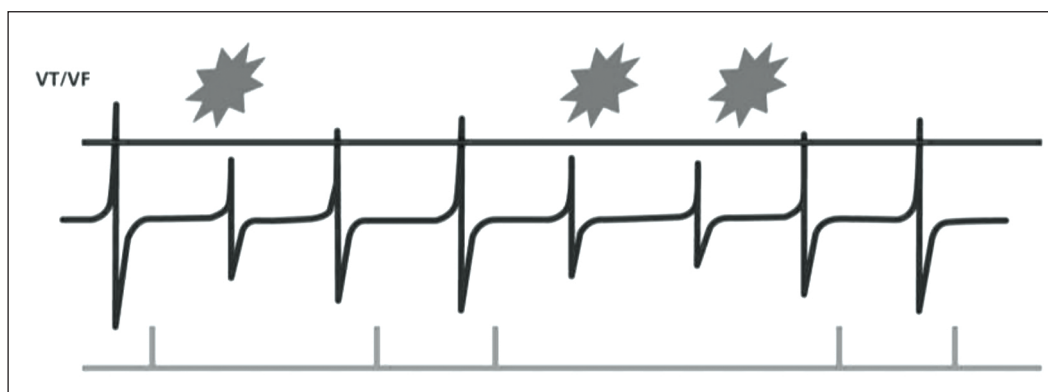

Figure 3. Possible detection failure of a slow ventricular tachycardia if the identified sensitivity failure was not corrected.

DISCUSSION

The ICDs, differently from pacemakers that posse fixed programming, present a sensitivity gain, called SenseAbility™ (Fig. 4) in the Abbott generators, whose purpose is to avoid failure of the sensitivity of quick and low amplitude ventricular events. The beginning of this sensitivity curve improves, called decay delay (Fig. 5) in the Abbott generators, and the speed of the sensitivity improvement, called threshold start (Fig. 6) in the Abbott generators, have a goal to avoid excessive sensitivity in T-waves, which would promote an inappropriate detection of a fake ventricular tachycardia. However, specifically, in this case, the programmed sensitivity improvement was promoting a failure of the ventricular sensitivity, which was corrected with the modification in the threshold start to 50% and the decay delay to 0 ms (Fig. 7).
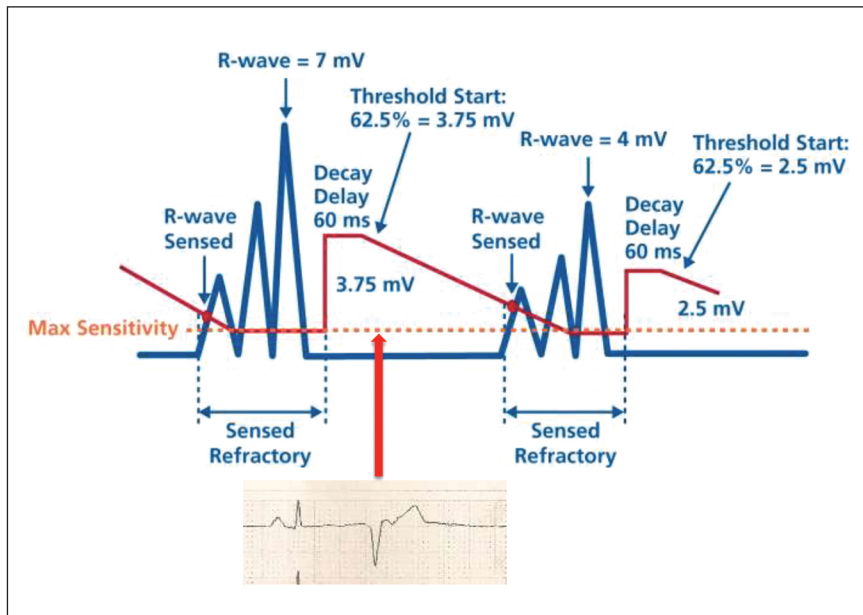
Figure 4. Abbot – St Jude Medical (Sense*Ability*™) cardioverter-defibrillator self-sensitivity gain and the moment when the patient's extrasystole was occurring, explaining its non-detection
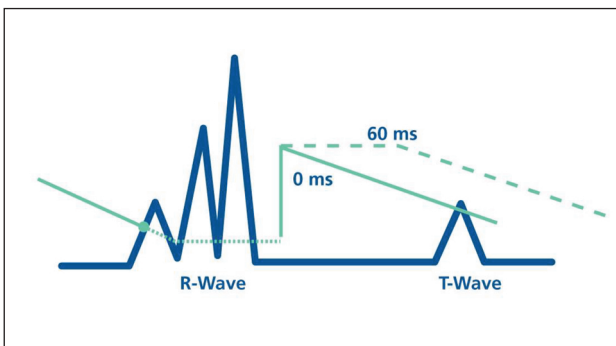

Figure 5. Abbot – St Jude Medical (Sense*Ability*™) ICD Sensitivity: "Decay Delay"; Moment after the sensed or stimulated QRS complex in which the auto-gain of sensitivity begins
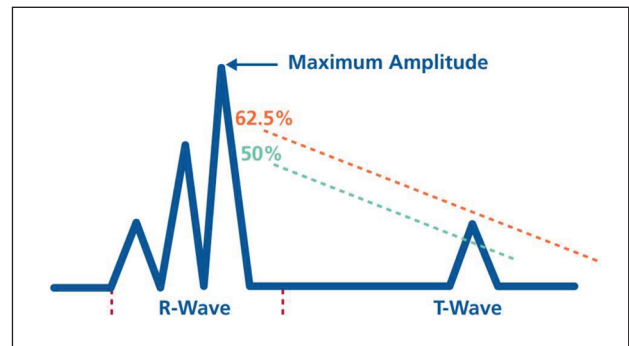

Figura 6. Abbot – St Jude Medical (Sense*Ability*™) ICD Sensitivity: "Threshold Start"; Amplitude after the sensed or stimulated QRS complex at which auto sensitivity gain begins.

Figure 7. Parameters related to auto sensitivity gain programming in this cardioverter-defibrillator and modifications made to correct the sensitivity failure identified in routine evaluation.

ANSWER

The programming of ICDs sensitivity is fundamental, since, if one ventricular arrhythmia is not detected, it will not be treated. Whenever the parameters of an ICD are modified to promote higher sensitivity, it must be evaluated the possibility of excessive sensitivity of T-wave or non-cardiac events (such as miopotential of the diaphragm muscle in integrated bipolar electrodes, cross-sensitivity of P-waves). Whenever the parameters of the ICD are modified to promote less sensitivity, it must be evaluated the possibility of induction of clinical arrhythmia of the patient, in order to verify if there is appropriate detection of the event.

REFERENCES

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