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# Recurrent ventricular fibrillation induced from supraventricular tachycardia in a case of hypertrophic cardiomyopathy

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## Discussion

A 45-year-old lady with apical hypertrophic cardiomyopathy (HCM) having good biventricular systolic function underwent implantable cardioverter defibrillator (ICD) implantation 3 years back for secondary prevention. Earlier, she received few anti-tachycardia pacing (ATP) therapies for monomorphic VT in the first year. Subsequently, she did well for the next 2 years on oral sotalol. This time, she was presented to out-patient-clinic with an episode of ICD shock. There was no preceding dizziness or blackout. Device interrogation revealed appropriate therapy for ventricular fibrillation (VF) [Fig. 1]. However, the onset of the VF was very unique. The tachycardia episode started with a premature atrial complex (PAC). As per the V = A branch with good morphology match and chamber of onset (atrium), the diagnosis was correctly made as SVT. However, at 38 seconds the tachycardia degenerated to VF and received an appropriate shock (15 J) at 44 seconds. Oral Amiodarone was started to prevent her SVT suspecting it as atrial tachycardia in the background of HCM. However, within the next 20 days there were several recurrences of the SVT and 2 of those episodes degenerated into VF very similarly. Hence, she was taken up for electrophysiology study which surprisingly revealed a concealed left lateral accessory pathway (AP) with orthodromic AVRT (ORT). The AP was successfully ablated.

Induction of VF from atrial tachycardia/atrial fibrillation in HCM is rare but reported [1–3]. Rapid atrial pacing can also induce VF in a subset of HCM [4]. A complex interplay of various electrophysiological and ischemic mechanisms is contemplated for this kind of VF induction [1,4]. There are occasional reports of polymorphic VT from other SVT without any overt structural heart disease [5]. There is an association of pre-excitation syndrome and HCM specially in the subset of PRKAG2 mutation [6,7]. But to the best of our knowledge, the occurrence of VF from ORT has never been reported. This interesting case highlights the importance of careful analysis of stored electrograms so that curative options can be offered.

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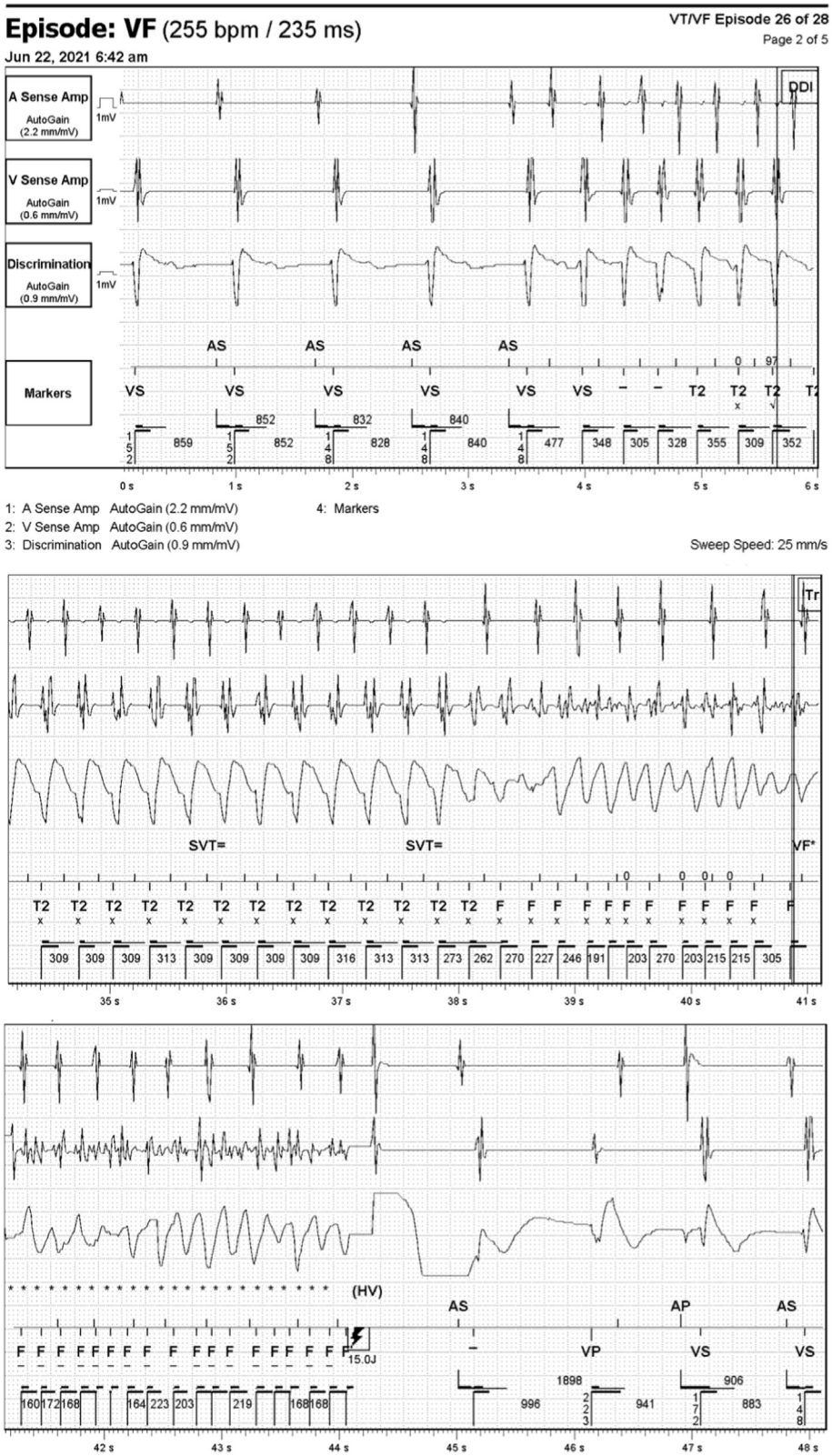


**Fig. 1.** A: Shows onset of the arrhythmia episode. It starts with a PAC (6th beat) and PR interval prolongation.
B: The tachycardia continues with 1:1 A:V relation and is initially diagnosed as SVT. Eventually a VF is induced at the termination of SVT. Similar VF induction was noted in all events requiring ICD shock.
C: A 15 J shock (HV) is delivered from ICD and the VF gets successfully terminated.

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## Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Declaration of competing interest

None.
Consent has been taken from the patient.

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