

# The first report of pseudoephedrine induced posterior fascicular left ventricular tachycardia

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## Abstract

Immediate diagnosis and prompt treatment of wide QRS-complex tachycardia is vital. Differential diagnosis of wide QRS tachycardia is also challenging. The most common cause of wide QRS-complex tachycardia is ventricular tachycardia (VT). Idiopathic fascicular left ventricular tachycardia is a rare form of VT, and observed often in young and individuals without underlying heart disease. Clinical presentations are recurrent episodes of palpitations and dizziness without a trigger factor. The paper introduces a case of sustained posterior fascicular left ventricular tachycardia triggered by pseudoephedrine.

**Keywords:** Pseudoephedrine, posterior fascicular, left ventricular tachycardia

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## Introduction

Patients presenting with ventricular tachycardia (VT) often have underlying structural heart disease.<sup>[1]</sup> VT observed in patients without structural heart disease is called idiopathic VT.<sup>[2]</sup> Idiopathic VTs is mainly divided into two groups according to ventricular origin; repetitive monomorphic VT (also called right ventricular outflow tract tachycardia) and idiopathic left VT.<sup>[1]</sup> Fascicular idiopathic left VT (IFLVT) constitutes 10-15% of all idiopathic VT.<sup>[3]</sup> It has been suggested that reentry might be the mechanism responsible for IFLVT.<sup>[3]</sup> Frequently posterior fascicle constitutes retrograde arm of the reentry loop (P-IFLVT).<sup>[3]</sup> P-IFLVT is characterized by relatively narrow QRS, right bundle branch block, left axis deviation, and verapamil sensitivity.<sup>[4]</sup>

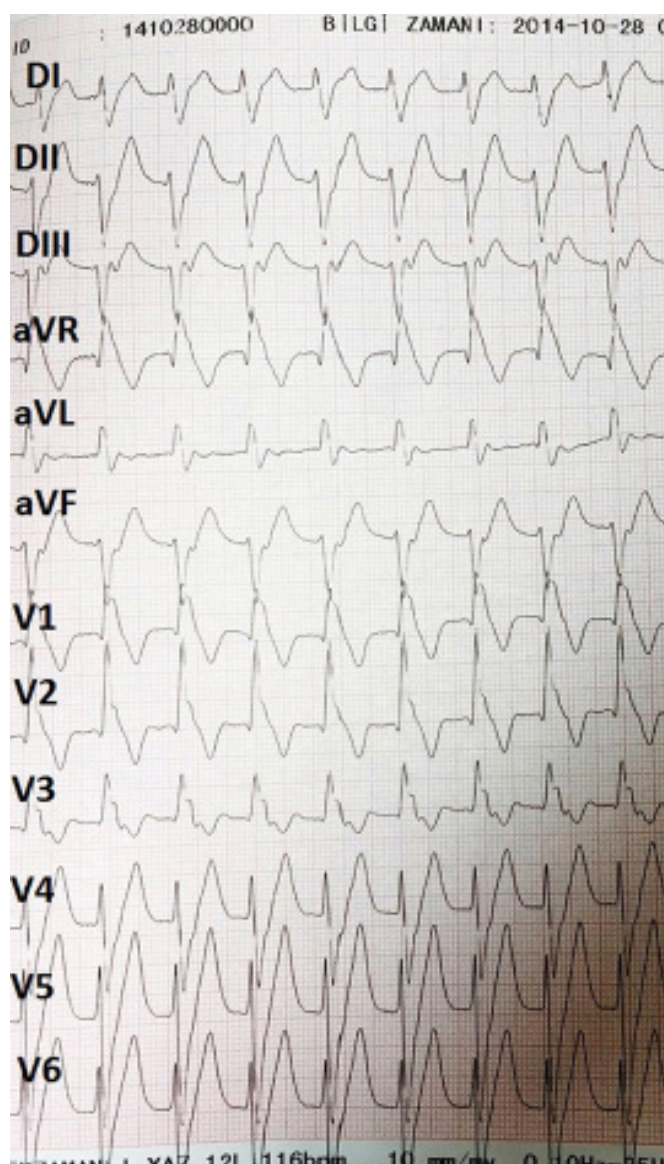
## Case

40 years old male with no known chronic heart disease was admitted to the emergency department because of palpitations. The patient had used cold medicine containing paracetamol and pseudoephedrine within the same day. Electrocardiogram (ECG) revealed wide QRS-complex tachycardia (206/bpm). Although the patient was hemodynamically stable, the tachycardia primarily was considered as VT. First, 300 mg amiodarone was administered intravenously but the tachycardia sustained. Repeated biphasic electrical cardioversion (CV) with 100-200 joules was performed due to resistant and sustained tachycardia, but failed. CV was repeated after intravenous administration of 5mg lidocaine but again failed. Then 3 g of magnesium sulfate (150 mg/min) and 5mg metoprolol was administered intravenously. The tachycardia rate decreased (116/bpm) but still sustained (**Figure 1**). Finally sinus rhythm was restored spontaneously (**Figure 2**). Detailed evaluation of 12-lead ECG demonstrated the wide QRS-complex tachycardia with right bundle branch block morphology and left axis deviation and was found to be P-IFLVT. The patient was assessed by echocardiography and coronary angiography electively. There was no structural heart disease. Electrophysiological study was recommended and was performed. A left ventricular posterior fascicular ventricular tachycardia (tachycardia cycle length of 390 ms) was induced by

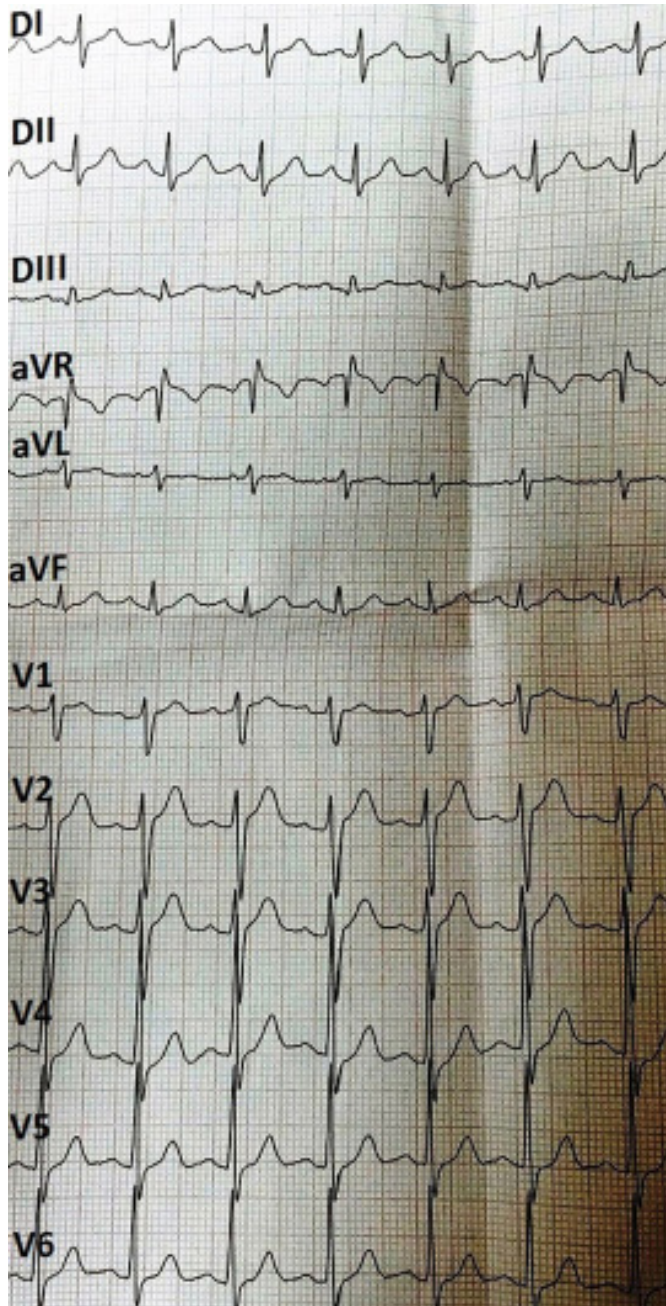
the programmed stimulation (500/350/200 ms). Radiofrequency ablation was done successfully with retrograde approach. The patient was discharged with 100 mg acetylsalicylic acid for 1 month.

## Discussion

There are four conditions that can cause wide QRS-complex tachycardia: VT, antidromic atrioventricular tachycardia, supraventricular tachycardia with aberrant conduction, and ventricular pacing.<sup>[1]</sup> The most common



**Figure 1:** The 12-lead electrocardiogram demonstrates the posterior fascicular idiopathic left ventricular tachycardia with right bundle branch block morphology and left axis deviation.



**Figure 2:** *The electrocardiogram shows the sinus rhythm after successful electrical cardioversion*

cause of wide QRS-complex tachycardia (70-80%) is VT.<sup>[1]</sup> Clinical status of the patient presenting with VT is often not stable.<sup>[1]</sup> However, the stable clinical situation never rules out diagnosis of VT.<sup>[1]</sup> Therefore, the patients with wide QRS-complex tachycardia should be considered as VT until proved otherwise, irrespective of the clinical condition. Various algorithms have been developed to be used in differential diagnosis of wide QRS-complex tachycardia.<sup>[5]</sup> But the implementation of these algorithms is complex and time consuming in emergency conditions.

Antidromic atrioventricular tachycardia, supraventricular tachycardia with aberrant conduction and VT were considered in the differential diagnosis of the tachycardia due to stable clinical condition of the patient, no known structural heart disease and the patient's age.<sup>[1]</sup> There were no concordance, dissociation, fusion and capture beats, but the absence of these did not exclude the diagnosis of VT. Right bundle branch block QRS duration > 140 ms, R / S ratio in V6 < 1, the presence of R wave in aVR were evaluated as findings in favor of the VT.<sup>[1]</sup> Finally the diagnosis of P-IFLVT was confirmed by the right bundle branch block with left axis deviation.

Most patients with common cold use systemic decongestant agents especially during the winter months. These agents, even bring some symptomatic benefit, sometimes serious arrhythmias were reported.<sup>[6]</sup> Pseudoephedrine is one of these agents commonly used.<sup>[1]</sup> Even though the patients with an underlying heart disease are more prone to cardiac arrhythmias, arrhythmias may occur in patients with no known heart disease.<sup>[1]</sup>

To the best of knowledge it's the first reported pseudoephedrine induced P-IFLVT. The differential diagnosis of wide QRS-complex tachycardia is crucial for prompt, accurate and efficient approach.

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### **Disclosure and conflicts of interest:**

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