Case Report

Fascicular Ventricular Tachycardia in a Pediatric Patient: Case Report

Jessica Laureano Martins,[1] *Moises Galdino Barros,*[2] *Daniel Moreira Costa Moura*[3]

Hospital Metropolitano Dom José Maria Pires,[1] *Santa Rita, PB – Brazil*
Centro Universitário de João Pessoa,[2] *João Pessoa, PB – Brazil*
Hospital Nossa Senhora das Neves,[3] *João Pessoa, PB – Brazil*

Abstract

A 10-year-old female patient, previously healthy, had been experiencing recurrent episodes of palpitations for three months. An electrocardiogram performed in the emergency department during one of these episodes initially raised suspicion of supraventricular tachycardia (SVT) due to the abnormally elevated heart rate (HR) and a relatively narrow QRS complex (100 ms). Pharmacological cardioversion with adenosine was attempted but unsuccessful. Reversion to sinus rhythm occurred only after the administration of intravenous amiodarone at a dose of 5 mg/kg.

During subsequent outpatient evaluation with a specialist, the diagnosis of fascicular ventricular tachycardia (FVT) was established based on characteristic electrocardiographic findings (regular tachycardia with a QRS complex widened for age, right bundle branch block (RBBB) pattern associated with an anterosuperior fascicular block (ASFB), fusion beats, and atrioventricular dissociation). Pharmacological treatment with verapamil was initiated; however, due to symptom recurrence, the patient successfully underwent radiofrequency ablation and has remained asymptomatic and free of recurrence during clinical follow-up.

Introduction

The diagnosis of cardiac arrhythmias in childhood is challenging due to nonspecific clinical presentations, the fact that they are rarely emergencies, and, in some cases, self-limited, which makes estimating their true incidence difficult.[1] Bradyarrhythmias and ventricular arrhythmias are considered rare in children. Ventricular tachycardia accounts for only 1.8% of arrhythmias diagnosed in pediatric series undergoing electrophysiological study (EPS).[1] FVT is the most common form of idiopathic left ventricular tachycardia, with predominance of the variant involving the posterior portion of the left fascicle.[2]

Despite its classic electrocardiographic pattern, FVT is often mistaken for SVT, leading to ineffective treatments and delaying appropriate therapy.[3,4]

Accurate diagnosis of cardiac arrhythmias in children requires ECG interpretation based on age-specific reference tables, with the Davignon table being the most widely used.[5]

This report describes the case of a 10-year-old patient with FVT, emphasizing the clinical presentation, electrocardiographic findings, common diagnostic pitfalls, and the ideal therapeutic approach. The relevance of the case lies in the rarity of this arrhythmia in childhood and in the diagnostic challenges arising from its electrocardiographic similarity to SVT.

Keywords

Ventricular Tachycardia; Cardiac Arrhythmias; Pediatrics.

Mailind Address: Jessica Laureano Martins •
Hospital Metropolitano Dom José Maria Pires. R. Roberto Santos Corrêa, S/N. Postal code: 58319-000. Santa Rita, PB – Brazil
E-mail: jessicalaureanom@gmail.com
Manuscript received December 16, 2025; revised manuscript June 1, 2026; accepted July 13, 2026.
Editor responsible for the review: Isabel Guimaraes

DOI: https://doi.org/10.36660/ijcs.20250287

Case Report

A 10-year-old female patient, weighing 42 kg, previously healthy, presented to the emergency department with palpitations. On examination, her main abnormal finding was a HR of 190 beats per minute (bpm). The ECG obtained during the episode (Figure 1) showed a QRS duration of 100 ms (widened for age according to the Davignon reference table), a RBBB morphology associated with an ASFB, the presence of fusion beats, and atrioventricular dissociation. Given the suspicion of SVT, two attempts at chemical cardioversion with adenosine were performed, as recommended by the American Heart Association's Pediatric Advanced Life Support (PALS) guidelines; however, reversion occurred only after intravenous infusion of amiodarone.[6] The patient was discharged with referral for outpatient follow-up.

The electrocardiographic characteristics of the tachycardia raised the hypothesis of FVT, and treatment with verapamil was initiated. A transthoracic echocardiogram and a 24-hour Holter monitor were performed, both yielding normal results.

The patient experienced recurrence of the tachycardia even after verapamil dose adjustment, and radiofrequency ablation was then indicated. During the EPS, tachycardia with the same electrocardiographic pattern was induced, and electrophysiological maneuvers confirmed the diagnosis of FVT. Radiofrequency ablation was successfully performed without complications. After the ablation, verapamil was discontinued, and the patient remained asymptomatic, with a normal ECG (Figure 2), over approximately 12 months of follow-up, ultimately being discharged from specialist care.

Discussion

In the present case, FVT was initially interpreted as SVT due to the relatively narrow QRS complex.[7] However, the presence of fusion beats already indicates a ventricular tachycardia, with FVT being one of its possibilities.[8] Diagnostic confusion between these two arrhythmias is common, leading to the use

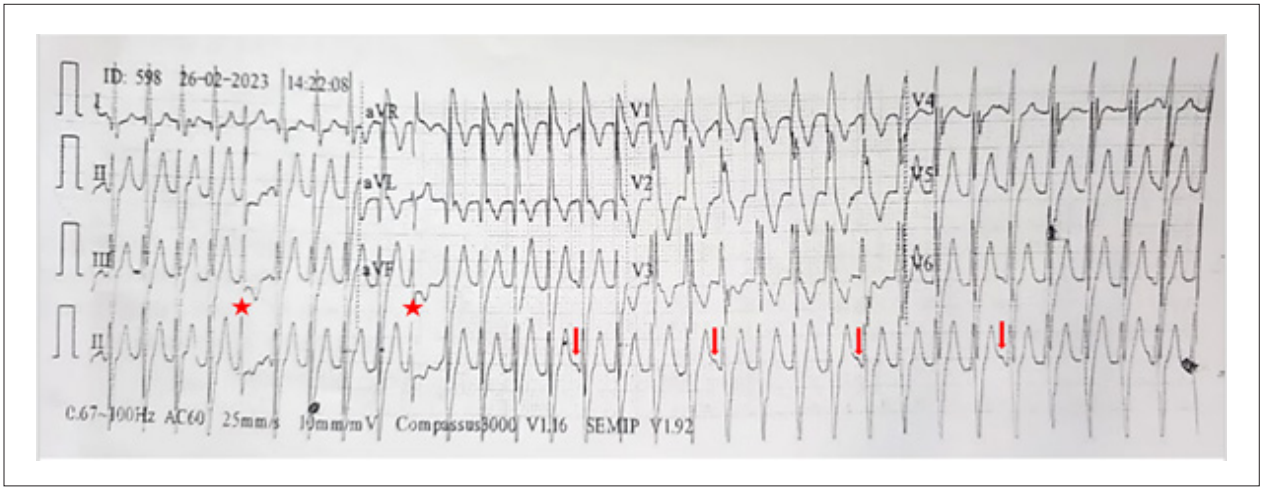


Figure 1 – *ECG during tachyarrhythmia episode – wide-QRS tachycardia for age, with morphology consistent with RBBB and ASFB, presence of fusion beats (*) and atrioventricular dissociation (arrows), findings suggestive of FVT. Source: Patient's medical record.*

of drugs such as amiodarone and adenosine, which are not specific treatments and therefore do not produce satisfactory responses.[4]

This diagnostic challenge is also related to the nonspecific clinical presentation. According to a multicenter study involving 129 patients, palpitations are the most common presenting symptom of FVT, whereas syncope or hemodynamic instability are less frequent. The same study reported a higher prevalence in boys (66%) and in the 10- to 11-year age group.[9] In the case described, the patient presented with palpitations – the most common symptom – and belonged to the most affected age group.

In the evaluation of FVT, four main aspects assist in its diagnosis: induction by atrial stimulation during EPS, presence of RBBB, left-axis deviation, and response to verapamil.[10] The Vereckei algorithm may help differentiate ventricular tachycardia from SVT with aberrancy by using specific criteria in lead aVR.[11] In the present case, the diagnosis of FVT was suspected after specialized evaluation and ECG review, and confirmed through EPS.

It is important to highlight that FVT has variants that modify the classic ECG pattern. This case involved a posteroinferior FVT, the most common subtype (81%), based on the electrocardiographic characteristics of RBBB with left-axis deviation.[12,13]

The response to verapamil is a hallmark of this arrhythmia. This drug acts on the slow pathway of the reentry circuit, interrupting the arrhythmia.[4] Verapamil prevents recurrence in most pediatric patients; however, long-term recurrence rates may reach 21%.[9] The child in this report achieved partial control of the arrhythmia with verapamil.

Radiofrequency ablation is the definitive treatment, with high success rates. It consists of mapping the affected fascicle and applying radiofrequency energy to block the circuit responsible for the arrhythmia.[12] The main indications include cases refractory to medical therapy, presence of ventricular dysfunction, or the desire to avoid long-term pharmacologic treatment. This last recommendation is particularly important in patients weighing more than 15 kg, such as the patient described, due to the low likelihood of spontaneous resolution.[12] The procedure has a success rate of approximately 71% in children.[9]

Conclusion

FVT is a challenging arrhythmia to diagnose in childhood due to its nonspecific clinical presentation and its electrocardiographic similarity to SVT, which may lead to ineffective treatments and delays in specific therapy. Radiofrequency ablation is an effective treatment and the preferred option for patients who do not achieve adequate control with medication. Knowledge of the typical electrocardiographic pattern of FVT enables accurate clinical diagnosis and appropriate management.

Author Contributions

Conception and design of the research: Martins JL; acquisition of data: Barros MG; analysis and interpretation of the data, statistical analysis and writing of the manuscript: Martins JL, Barros MG; critical revision of the manuscript for intellectual content: Martins JL, Moura DMC.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

Sources of Funding

There were no external funding sources for this study.

Study Association

This study is not associated with any thesis or dissertation work.

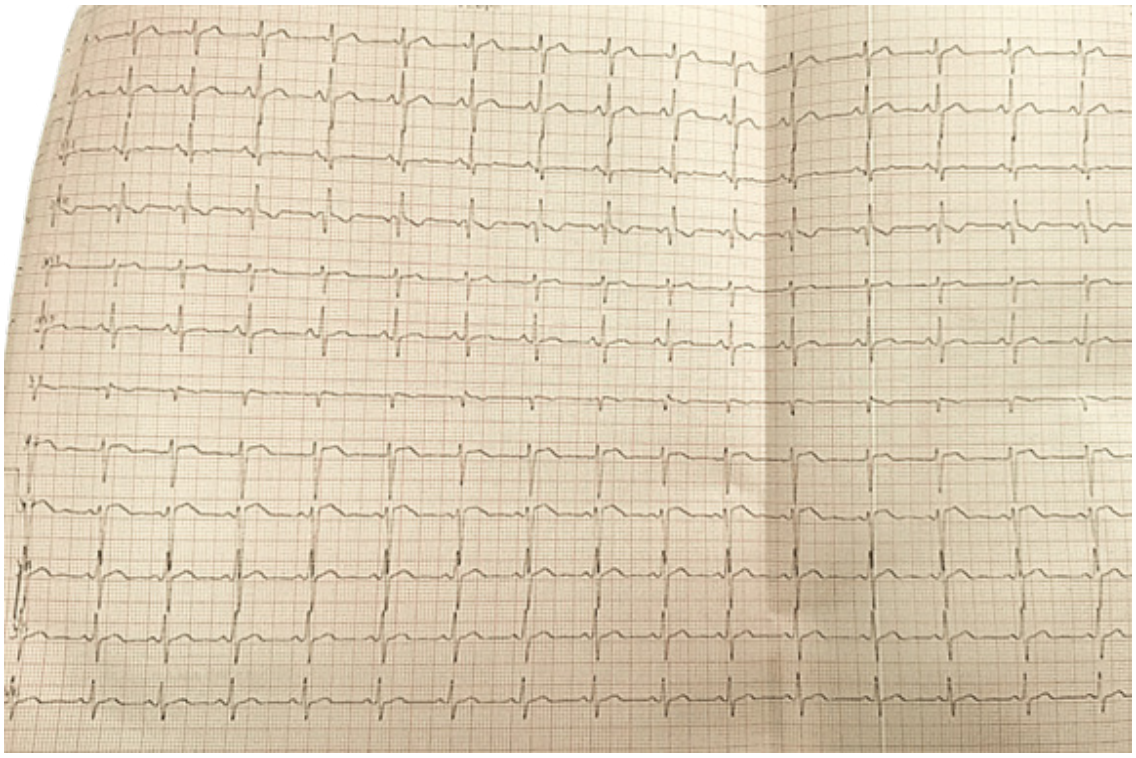


Figure 2 – *ECG after ablation – sinus rhythm, preserved QRS axis, HR 70 bpm, PR interval 120 ms, QRS 80 ms, with no signs of overload or conduction blocks. Source: Patient's medical record*

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of the Centro Universitário de João Pessoa – UNIPÊ/PB under protocol number 7.708.902. All procedures in this study were in accordance with the 1975 Helsinki Declaration and its later amendments. Informed consent was obtained from all participants included in the study.

Use of Artificial Intelligence

The authors did not use any artificial intelligence tools in the development of this work.

Availability of Research Data

The data cannot be made publicly available.

References

1. Magalhães LP, Guimarães I, Melo SL, Mateo E, Andalaft RB, Xavier L, et al. Diretriz De Arritmias Cardíacas Em Crianças E Cardiopatias Congênitas SOBRAC e DCC - CP. Arq Bras Cardiol. 2016;107(1 Suppl 3):1-58. doi: 10.5935/abc.20160103.
2. Velázquez-Rodríguez E, García-Hernández N, Silva-Oropeza E, Jiménez-Arteaga S, Martínez-Sánchez A, Alva-Espinoza C, et al. Idiopathic Left Fascicular Ventricular Tachycardia in Children and Adolescents. Bol Med Hosp Infant Mex. 2022;79(4):248-58. doi: 10.24875/BMHIM.21000222.
3. Andalaft RB, Valdigem BP, Berbert GH, Moreira DAR, Habib RG, Almeida C, et al. Taquicardia Fascicular em Jovens: Diagnóstico e Abordagem Terapêutica Específica Numa Série de 9 Casos. Rev Soc Cardiol Estado de São Paulo. 2019;29(Suppl. 2b):133.
4. Andalaft RB, Xavier LFR. Arritmias Cardíacas na Prática Pediátrica: da Emergência ao Consultório. São Paulo: Di Livros; 2025.
5. Davignon A, Rautaharju P, Boisselle E, Soumis F, Mégélas M, Choquette A. Normal ECG Standards for Infants and Children. Pediatr Cardiol. 1980;1(2):123-31. doi: 10.1007/bf02083144.
6. American Heart Association. Pediatric Advanced Life Support (PALS) Provider Manual. Dallas: American Heart Association; 2025.
7. Andalaft RB. Arritmias Cardíacas em Crianças e Adolescentes. In: Sociedade Brasileira de Cardiologia. Como Tratar: Cardiologia Pediátrica e Cardiogeriatria. Barueri: Manole; 2010. p. 114-158.
8. De Ponti R, Bagliani G, Padeletti L, Natale A. General Approach to a Wide QRS Complex. Card Electrophysiol Clin. 2017;9(3):461-85. doi: 10.1016/j.ccep.2017.05.006.
9. Collins KK, Schaffer MS, Liberman L, Saarel E, Knecht M, Tanel RE, et al. Fascicular and Nonfascicular Left Ventricular Tachycardias in the Young: An International Multicenter Study. J Cardiovasc Electrophysiol. 2013;24(6):640-8. doi: 10.1111/jce.12105.

10. Catabriga GB, Diniz LR, Lovatti LRD, Kataoka TD, Silva TM. Taquicardia Ventricular Fascicular em um Hospital de Referência Pediátrico. Braz J Health Rev. 2024;7(2):e67824. doi: 10.34119/bjhrv7n2-040.

11. Vereckei A, Duray G, Szénási G, Altemose GT, Miller JM. New Algorithm Using Only Lead aVR for Differential Diagnosis of Wide QRS Complex Tachycardia. Heart Rhythm. 2008;5(1):89-98. doi: 10.1016/j.hrthm.2007.09.020.

12. Cronin EM, Bogun FM, Maury P, Peichl P, Chen M, Namboodiri N, et al. 2019 HRS/EHRA/APHRS/LAHRS Expert Consensus Statement on Catheter Ablation of Ventricular Arrhythmias. Heart Rhythm. 2020;17(1):e2-e154. doi: 10.1016/j.hrthm.2019.03.002.

13. Nogami A. Diagnosis and Ablation of Fascicular Tachycardia. Asia Pac Cardiol. 2011;3(1):67-73.

This is an open-access article distributed under the terms of the Creative Commons Attribution License