

Resolution of severe cardiomyopathy after catheter ablation of an anteroseptal accessory pathway: A case report

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Abstract

Background: In patients with non-sustained tachyarrhythmias, left ventricular (LV) systolic dysfunction is uncommon. The role of catheter ablation (CA) in asymptomatic patients with tachyarrhythmia remains unclear. **Case presentation:** We report a 20-year-old patient without sustained tachyarrhythmia with a left ventricular ejection fraction of 20% who underwent radiofrequency catheter ablation (RFCA) of anteroseptal accessory pathway. She achieved normalization of left ventricular systolic function noted on echocardiography performed at four weeks post-ablation. **Conclusions:** Our case highlights significant improvement in LV systolic function after catheter ablation of an “asymptomatic” ventricular preexcitation. Current guidelines do not endorse ablating asymptomatic patients, but careful follow up with serial echocardiograms might be warranted. Prophylactic ablation of those patients with clear evidence of LV dyssynchrony or wide left bundle branch pattern and persistent preexcitation is worth further consideration.

Resolution of severe cardiomyopathy after catheter ablation of an anteroseptal accessory pathway: A case report

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Conclusions: Our case highlights significant improvement in LV systolic function after catheter ablation of an “asymptomatic” ventricular preexcitation. Current guidelines do not endorse ablating asymptomatic patients, but careful follow up with serial echocardiograms might be warranted. Prophylactic ablation of those patients with clear evidence of LV dyssynchrony or wide left bundle branch pattern and persistent preexcitation is worth further consideration.

Key words:

Catheter ablation, tachyarrhythmia, cardiomyopathy, accessory pathway, case report

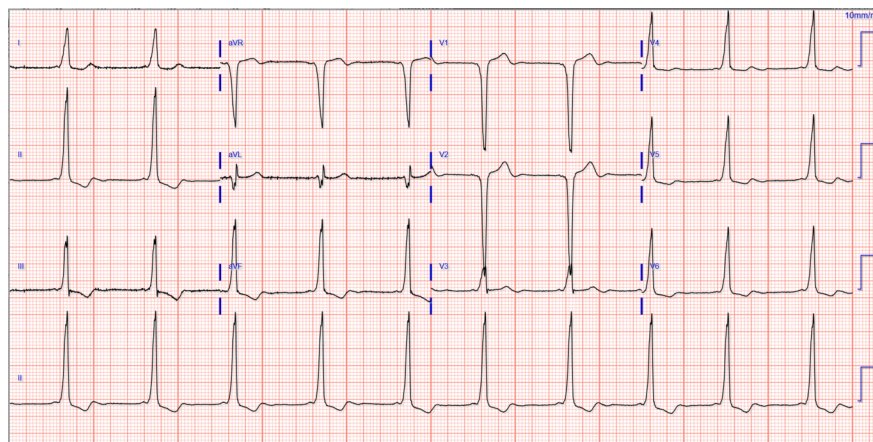
Introduction

Ventricular preexcitation is encountered in 0.2% of the population and has been associated with supraventricular tachycardia, characterized by sudden cardiac death in as many as 0.47% of patients [1-4]. Heart failure is an uncommon morbidity in WPW syndrome and typically associated with recurrent tachycardia. Left ventricular systolic dysfunction in adults with WPW syndrome in absence of tachyarrhythmias has been rarely reported [5-11]. Although catheter ablation (CA) of accessory pathway is an established treatment for symptomatic WPW syndrome, its utility in asymptomatic patients remains unclear. A recent study involving 80 patients with WPW syndrome without tachyarrhythmia noted that left ventricular ejection fraction (LVEF) was significantly lower in patients with septal and right free wall accessory pathways, and CA of the accessory pathway (AP) resulted in mechanical resynchronization and improved LV function within three months [12]. We report a patient with WPW syndrome without sustained tachyarrhythmia who underwent radiofrequency catheter ablation (RFCA) achieving normalization of left ventricular systolic function.

Case presentation

Our patient is a 20-year-old female who was referred for ventricular pre-excitation and cardiomyopathy after presenting 2 months prior with shortness of breath and chest discomfort. The patient had no significant past medical history. Her initial evaluation was notable for an abnormal EKG demonstrating ventricular pre-excitation and an echocardiogram with evidence of severe LV systolic dysfunction (Figure 1). Her LV ejection fraction was 20% and she was initiated on a heart failure regimen including carvedilol and lisinopril. A nuclear stress test showed no defects suggestive of ischemia or infarct. The patient continued to be limited with NYHA II symptoms but denied any symptoms of palpitations or syncope/near-syncope. She was also referred to the heart failure team and possible advanced therapy.

Figure 1.



She was overall otherwise healthy with no remarkable past medical history or comorbidities. She was a mother of two children and reported being a never-smoker. She reported not drinking alcohol currently, although endorsed marijuana use twice a week. Differential diagnoses included pre-excitation-associated left ventricular dysfunction, infiltrative cardiomyopathy, and idiopathic cardiomyopathy. Since the patient was asymptomatic from an arrhythmia perspective, our initial approach was to exclude other causes of her dilated cardiomyopathy and a cardiac MRI was obtained demonstrating LV dysfunction without late gadolinium enhancement or infiltrative changes. She also completed a 30-day mobile cardiac telemetry monitor showing sinus rhythm with preexcitation and a low burden of pre-excited atrial fibrillation (6%) with controlled ventricular response (average 75 bpm). Interestingly, loss of preexcitation was noted during sinus tachycardia (beyond 120 bpm).

Due to the patient's persistent cardiomyopathy despite compliance to medical regimen, and evidence of significant LV dyssynchrony on both cardiac echocardiography and MRI, we decided to proceed with ablation of her septal pathway. Cryotherapy catheter ablation of the anteroseptal pathway was performed successfully after a detailed electrophysiology study and mapping procedure (Figure 2). On follow up, the patient had complete normalization of her LV function as documented on echocardiography 4 weeks post-ablation with resolution of her heart failure symptoms. Her follow up ECG showed successful elimination of preexcitation at the 3-month follow-up visit. (Figure 3)

Figure 2 (a). Site of successful ablation:

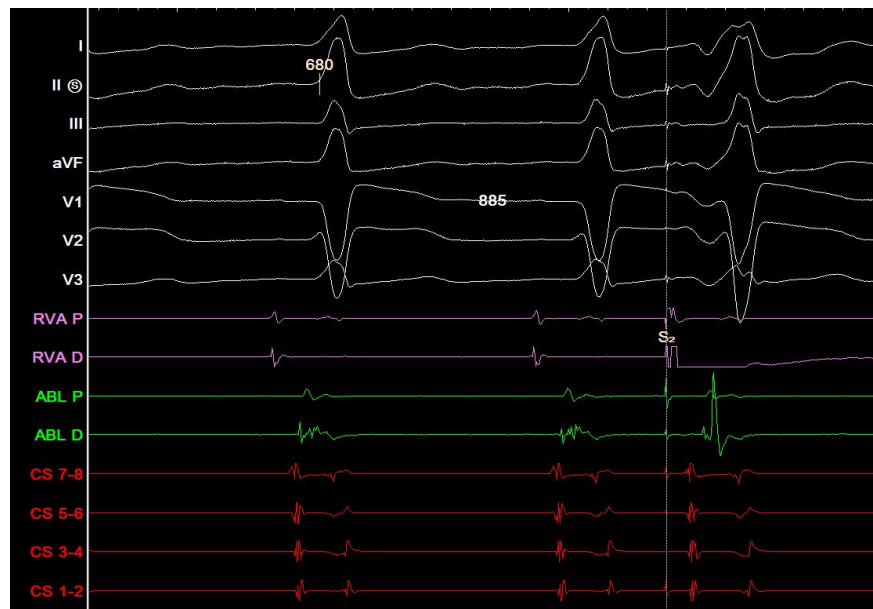


Figure 2 (b)



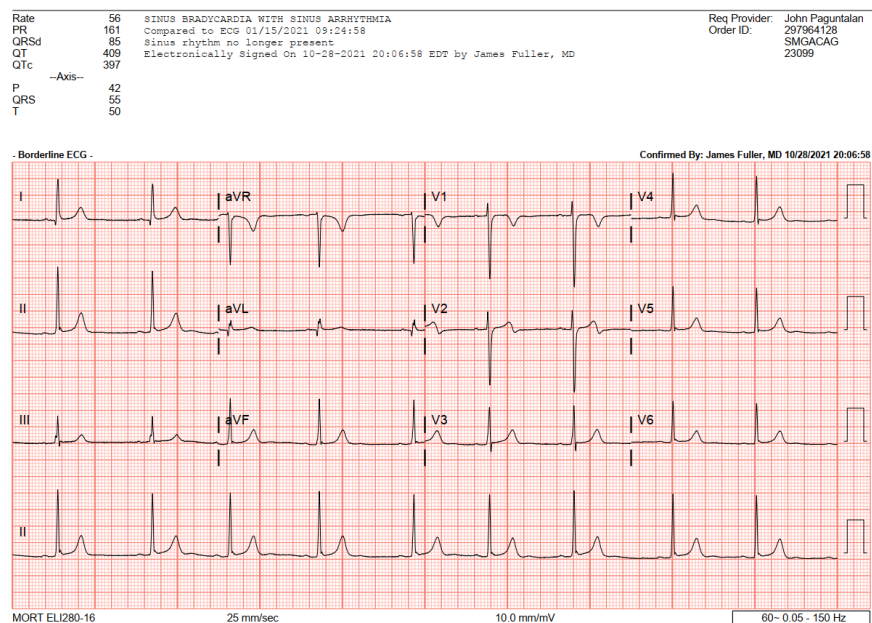
Discussion

Incessant/recurrent tachycardia has been noted to be a cause of LV dysfunction in some patients with WPW syndrome consistent with tachycardia-induced pathophysiology [13]. Our patient experienced significant improvement in LV systolic function after CA of an “asymptomatic” ventricular preexcitation. Several previous studies have reported resolution of LV dyssynchrony, improvement in LV function after treatment of septal or right sided AP with CA [7, 8, 14-16]. This improvement can be explained by resolution of the left bundle branch pattern of activation and resultant reverse remodeling. A recent study exploring the relationship between AP location and LV dysfunction noted that LV function was significantly lower in WPW patients with septal and right free wall accessory pathways [12]. Our patient was being evaluated for possible heart transplantation when she presented to us and undergoing CA resulted in resolution of her cardiomyopathy. In such patients, it is imperative to consider the possibility of AP-induced LV dyssynchrony and LV dysfunction.

Conclusions

Our case adds to the available data highlighting the risk that asymptomatic right-sided and septal pathways pose with respect to LV dysfunction. Ablating these asymptomatic patients is not endorsed in the current guidelines but careful follow up with serial echocardiograms might be warranted. Whether we should prophylactically ablate those patients with clear evidence of LV dyssynchrony or wide left bundle branch pattern and persistent preexcitation is worth further consideration.

Figure 3.



Abbreviations

CA – Catheter ablation

RCFA – Radiofrequency catheter ablation

WPW - Wolff-Parkinson-White

AP – Accessory pathway LVEF – Left ventricular ejection fraction

Learning objectives

Case: A patient with Wolff-Parkinson-White (WPW) syndrome who presented with cardiomyopathy

To acknowledge LV systolic dysfunction in patients with asymptomatic, non-sustained tachyarrhythmias

To understand role of catheter ablation (CA) of the accessory pathway (AP) in mechanical resynchronization and LV function improvement

Declarations

Ethics approval and consent to participate: N/A

Consent for publication: Patient consent was acquired for publication

Availability of data and materials: All relevant data supporting the conclusions of this article are included within the article.

Competing interests: None

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Authors' contributions: HE and VL envisioned project. VL led data collection. OB and HE conducted literature review. OB and HE wrote manuscript. All authors reviewed, read and approved the manuscript prior to submission.

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Figure Legends

Figure 1. Baseline ECG demonstrating preexcitation consistent with anteroseptal pathway.

Figure 2 (a). Site of successful ablation: Ablation catheter demonstrating atrial ventricular and a pathway potential that is uncovered by an atrial extrastimulus (S2). RVA – right ventricular apex, CS – Coronary sinus, ABL – ablation, P- proximal, D – distal.

Figure 2 (b) Loss of pre-excitation 20 seconds after initiation of cryo ablation.

Figure 3. ECG on 3 months post-ablation follow-up demonstrating loss of preexcitation and normalization of the QRS complex.

Additional Files

File name: Video 1

- Title of data: Pre-ablation echocardiogram
- Description of data: Pre-ablation echocardiogram showing decreased left ventricular ejection fraction

File name: Video 2

- Title of data: Post-ablation echocardiogram
- Description of data: Post-ablation echocardiogram highlighting normalization of left ventricular systolic function