

# Epstein-Barr Virus Associated Myopericarditis Presenting as Generalized Anxiety

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Received August 16, 2020; Revised September 19, 2020; Accepted September 28, 2020

**Abstract Background:** This case highlights the importance of motivational interviewing in a rare condition with comorbid psychiatric symptomology. Epstein-Barr Virus (EBV) induced myopericarditis has not been described in a healthy young woman. Her anxiety symptoms complicated the diagnosis of this condition. **Case presentation:** Ms. A is an otherwise healthy 26-year-old female with a history of generalized anxiety disorder. She presented to the emergency department with anxiety and a sense of impending doom. Her family history is positive for hypertension and unspecified mental health issues. She refused workup due to panic symptoms but was persuaded through motivational interviewing. Eventual cardiac MRI revealed viral induced myopericarditis. The outcome was both resolution of her cardiovascular and psychiatric symptomology. **Conclusion:** The implications of this case report is the value of addressing psychological resistance to pathophysiological workup. Once her concerns were addressed through psychological and psychopharmacological methods, a rare cardiovascular disorder was identified and treated. The lesson for healthcare providers is that nonjudgmental interviewing can lead to the diagnosis of very uncommon diseases.

**Keywords:** EBV pericarditis, stigma, anxiety, motivational interviewing

**Cite This Article:** William Butler, Bryan Pacheco, Koleton Forehand, Paul Gursky, and Melodie Mope, "Epstein-Barr Virus Associated Myopericarditis Presenting as Generalized Anxiety." *American Journal of Medical Case Reports*, vol. 8, no. 12 (2020): 532-534. doi: 10.12691/ajmcr-8-12-27.

## 1. Introduction

This case study illustrates a young woman presenting to the emergency department with anxiety symptoms and chest fluttering who refused cardiovascular workup. It highlights the importance of incorporating motivational interviewing to uncover a rare disease association of Epstein-Barr virus (EBV) induced myopericarditis.

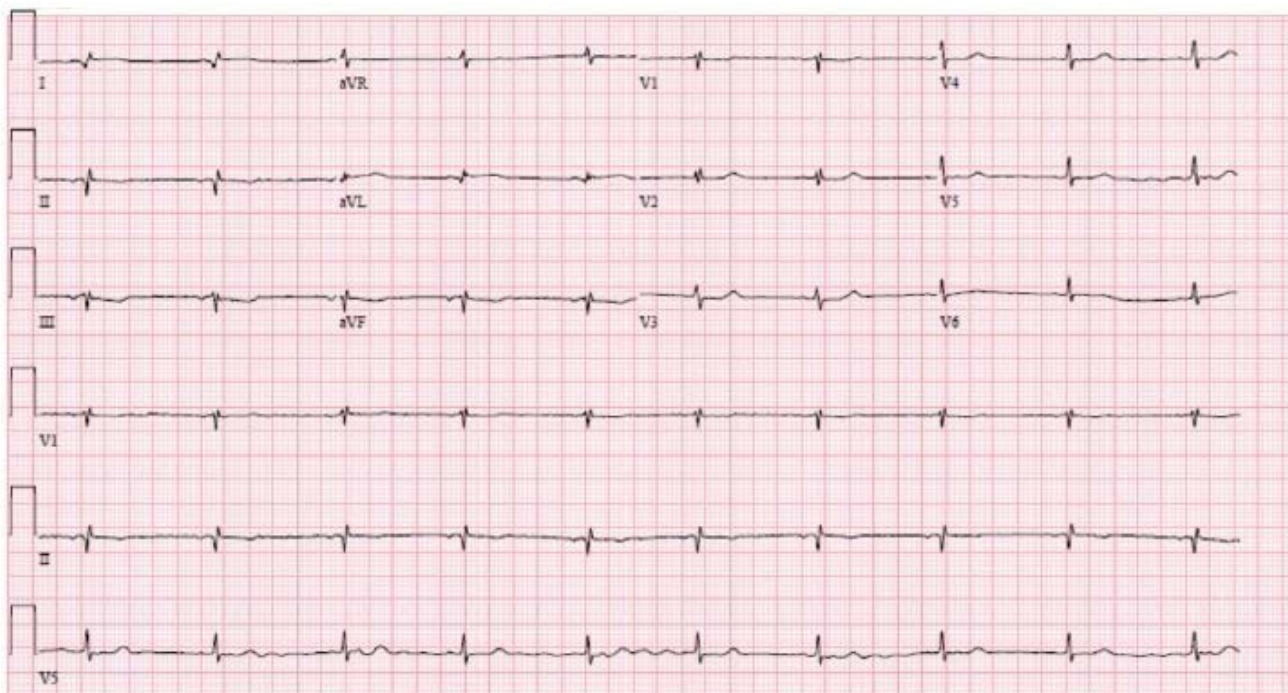
## 2. Case Presentation

Ms. A is a 26-year-old woman with a history of generalized anxiety disorder presenting to the emergency room with a sense of impending doom and chest fluttering. She recently discontinued her paroxetine against medical advice as it did not resolve her symptoms. She had no other chronic medical problems. Upon arrival, the patient refused medical workup and believed her symptoms were due to an "anxiety attack". She was persuaded that these symptoms might be due to something else and underwent initial electrocardiography (EKG) and troponin lab work. Her troponins peaked at 151 and an EKG revealed non-ST-elevation myocardial infarction (NSTEMI) (Figure 1).

The patient was started on ibuprofen and colchicine for suspected pericarditis which improved her symptoms.

Cardiac magnetic resonance imaging (MRI) was attempted on the first day of admission, but the patient was severely anxious and unable to stay still for the procedure and it was canceled. The next day, she was able to tolerate the study after nonjudgmental and reflective questioning regarding her refusal, addressing maladaptive beliefs, and agreeing to try it with the aid of a low dose benzodiazepine. She also agreed to an echocardiogram which showed pericardial effusion. Her troponins were elevated throughout the hospital admission and were expected to decrease once her inflammation improved. Through motivational interviewing, she endorsed a recent viral prodrome. Subsequent serology confirmed recent EBV infection. The cardiac MRI was subsequently positive for extensive subepicardial late gadolinium enhancement of the basal-mid-apical, anterior, anterolateral, lateral, and inferolateral wall, of a non-ischemic pattern, < 25% of transmural thickness. Her calcium score was 0. These findings suggest acute cardiac inflammation, or myopericarditis, likely due to EBV.

The patient had no other previously documented medical or psychiatric history, and was on a regular diet, had no known drug allergies, did not smoke, drink, or use recreational drugs. Her family history was positive for unspecified mental health issues and adult onset hypertension.



**Figure 1.** Low-voltage EKG showing left axis deviation and diffuse ST-segment changes with concern for NSTEMI.

### 3. Discussion and Conclusions

This case highlights the importance of motivational interviewing in pursuing workup for patients without traditional risk factors for life-threatening disease. In addition, pericarditis with NSTEMI in an immunocompetent young woman, likely due to EBV, is an undocumented condition for her demographic.

EBV belongs to a family of nine human herpesvirus types and is very common in humans [1]. It is associated with Burkitt lymphoma, Hodgkin's lymphoma, gastric cancer, hairy leukoplakia, and nasopharyngeal carcinoma. It infects and remains dormant in B cells [2]. It is not classically associated with heart disease, however, the correlation between EBV and acute cardiac events has been speculated in a few cases [3,4]. This case correlates with two other documented cases of possible EBV induced pericarditis, without NSTEMI. This is significant because an NSTEMI would suggest a reversible viral pathology or anxiety-induced vasospasm [5]. These studies have prompted further investigation for possible mechanistic markers including inflammatory cytokines in vitro blood. Specifically, it has been proposed that the pro-inflammatory action of the protein dUTPase may play a role in causing acute myocardial events [7]. However, the exact mechanism of this process remains elusive and documented cases of possible EBV induced myocardial events are very uncommon.

While the biological process of this constellation of symptoms is unique, the psychosocial factors provide teaching points for all patients with anxiety. The patient endorsed that she had a history of generalized anxiety disorder managed by her family medical physician but had not been seen by a psychiatrist or counselor. The reason for this was attributed to mental health stigma (i.e., that her anxiety was not "that bad") which is a common cause for lack of referrals [7]. This anxiety was so severe that

she was unable to perform routine diagnostic workups including initial resistance to EKG. In addition, an MRI was canceled due to her anxiety.

Chest pain can often cause elevations in heart rate which may make symptoms of anxiety worse and lead to atypical presentations. Anxiety and a sense of impending doom are also common, nonspecific manifestations of cardiac disease. Furthermore, the clinical picture also fits NSTEMI due to vasospasm which can be caused by anxiety. In addition, the evidence for a correlation between anxiety, noncompliance, and suboptimal care is well established especially with patients who do not fit a classic clinical picture [8]. This is likely due to framing bias which can cause missed diagnoses, unnecessary workups, and poor health care delivery [9]. Ironically, failing to address her underlying medical problems would likely make her anxiety worse causing a downward spiral of outcomes. Thankfully, in this case, further motivational interviewing and medical workup was pursued.

This all highlights the necessity of having a high index of suspicion for organic causes for disease in patients with psychiatric conditions. Cardiac angina in an otherwise healthy 26-year-old female is uncommon. It would be a mistake to attribute these symptoms to her anxiety regardless of how "resistant" to diagnostic workup the patient may present. This is a common mistake made by healthcare providers who may inappropriately stigmatize patients with mental health symptoms or inappropriately label patients as nonadherent [10]. In this situation, taking the patient's chief complaint seriously was potentially lifesaving.

Applying concepts from motivational interviewing to understand her resistance did more than establish rapport. While the importance of the therapeutic alliance has been studied extensively when treating mental health issues, its role has been less thoroughly investigated for the diagnostic workup of biological diseases [11]. In this case,

motivational interviewing techniques involved shared decision making (i.e., “What do you understand about your EKG and are you comfortable with the next steps?”) and open-ended, reflective inquiries (i.e., “So, what is it about an MRI that brings you fear?”) Respecting a patient’s right to decline treatment if it becomes too uncomfortable, such as the panic associated with agoraphobia and an MRI machine, also helped the patient to trust her care team. Allowing her to decline and pursue complementary treatment (i.e., benzodiazepines) ultimately led to an unexpected result of myopericarditis.

In addition to concerns over trust and patient compliance, anxiety has also been singled out as a risk factor for coronary heart disease and NSTEMI vasospasm [12]. This is not to suggest that the patient’s anxiety caused her NSTEMI, but that her anxiety should be addressed as a critical aspect of her overall cardiovascular health. Rather than dismissing this anxiety as a separate process, approaching it as being related to very real and significant problems is important. In this case, taking her anxiety seriously and working with it uncovered a zebra when the team initially only heard anxious hooves.

### Clinical Teaching Points

- A thorough cardiac workup should be pursued in the emergency setting with any patient presenting with a vague sense of impending doom, anxiety, or chest pain.
- Patients with mental health disorders may receive less thorough workups for a physical origin of their illness than other patients due to mental health stigma.
- Motivational interviewing and establishing a therapeutic alliance can negotiate the agenda to investigate uncommon causes of distress.

### List of Abbreviations

Epstein-Barr virus = EBV

Electrocardiography = EKG

Non-ST-elevation myocardial infarction = NSTEMI

Magnetic resonance imaging = MRI

### Acknowledgements

Our case study did not receive any funding or financial support.

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