



## Diagnosis of Spontaneous Vertebral Artery Dissection in a Healthy Teenager

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### Abstract

Spontaneous Vertebral Artery Dissection (SVAD) is a rare condition typically characterized by headache, neck pain, and tinnitus with most dissections occurring in middle-aged adults. Spontaneous dissections cause approximately 2% of all strokes, but account for significant morbidity for pediatric patients. We present a case of SVAD in a healthy teenager with atypical symptoms.

### Introduction

Spontaneous vertebral artery dissection in the general population is rare occurring with an annual incidence between 2.5 to 3 cases/100,000 [1]. Most dissections occur during the fifth decade of life. Spontaneous dissections cause approximately 2% of all strokes, but account for significant morbidity for pediatric patients.

Three studies conducted in the 1990's by Schievnik et al. [2-5] attempted to determine the underlying etiology of SVAD. Autosomal polycystic kidney disease, Marfan syndrome, and Ehlers-Danlos type IV are associated with a 1%-5% increased risk for SVAD. Family history of SVAD was a minor risk factor. In 1999, Grau et al. [6] reported that recent respiratory infections are a risk factor. Although these risk factors are known, due to the overall low incidence of VAD, it is difficult to apply them as predictors of disease.

According to a 2013 study by Von Babo et al. [7,8], individuals with SVAD typically present with: cerebral ischemia (84.4%), headache (70.4%), neck pain (65.8%), subarachnoid hemorrhage (6%), and tinnitus (3.4%). In this report, we present a case in which SVAD was initially misdiagnosed due to both the lack of risk factors and common symptoms.

### Case Presentation

A healthy 16-year-old Caucasian male presented with vertigo, nausea, vomiting, blurred vision, and left sided extremity weakness. He denied smoking, alcohol, drug use, or family history of significant disease. Symptoms were present upon waking six days prior. He had been lifting weights the day before symptoms began, but denied injury. He had been evaluated at an outside hospital with a normal non-contrast head CT, given a diagnosis of benign positional vertigo, and discharged home. Despite symptomatic therapy, his symptoms worsened.

The pertinent physical findings on presentation to our emergency department: blood pressure 148/91, heart rate 57, with normal temperature, pulse oximetry, and respiratory rate. The right pupil was 3 mm in diameter with minimal response to light and accommodation. Cranial nerves were otherwise intact. There was 4/5 strength in the left upper and lower extremity versus 5/5 on the right side. A decrease in sensation was noted to light touch and temperature in his left arm and leg. A mild left dysmetria was observed. The patient was unable to stand due to loss of balance.

Blood work showed a normal CBC, chemistry, and INR. A Computer Tomography (CT) angiogram of the neck was performed and revealed an occlusion of the distal segment of the right vertebral artery (Figure 1). Magnetic Resonance (MR) imaging of the brain showed acute right posterior inferior cerebellar artery territory infarctions located at the inferior cerebellum and posterior medulla (Figure 2). A MR angiogram of the neck revealed a right vertebral artery dissection (Figure 3).

He was admitted to the hospital and oral aspirin therapy was initiated for treatment of the VAD. No invasive intervention or further anti-coagulation was deemed necessary by the neurosurgery team [9,10]. The patient had an uneventful hospital course. He was discharged five days after admission on aspirin therapy with three months abstinence from weight lifting and contact sports.

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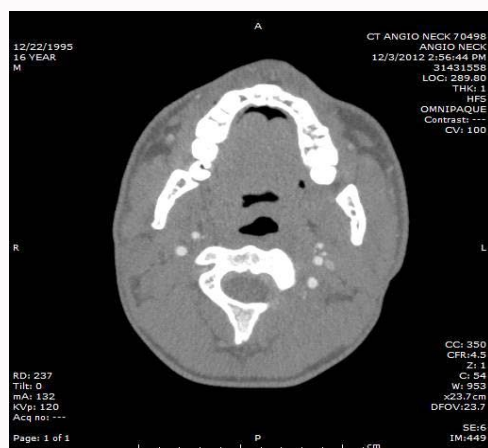
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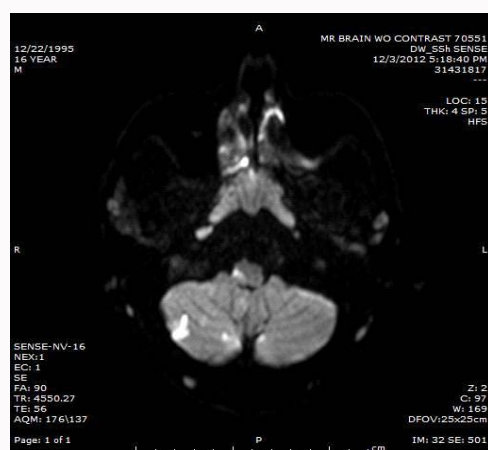
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**Figure 1:** A Computer Topography (CT) angiogram of the neck was performed and revealed an occlusion of the distal segment of the right vertebral artery.



**Figure 3:** A MR angiogram of the neck revealed a right vertebral artery dissection.



**Figure 2:** Magnetic Resonance (MR) imaging of the brain showed acute right posterior inferior cerebellar artery territory infarctions located at the inferior cerebellum and posterior medulla.

At three month follow up he was doing well with resolution of his symptoms.

## Discussion

Of 134 patients retrospectively studied with spontaneous vertebral artery dissection, the most common presenting symptoms were head and/or neck pain, and pulsatile tinnitus with 13 (8%) asymptomatic [8]. Many other diagnoses can present with vertigo, nausea and vomiting such as benign positional vertigo, alcohol intoxication, and post concussion syndrome. Spontaneous vertebral artery dissection is such an uncommon entity that in this case it is not unexpected that this patient's initial evaluation did not lead to the correct diagnosis.

A concerning aspect of this teenager's physical examination was the unilateral extremity weakness with vision complaints. Any posterior circulation symptoms and extremity weakness should raise a red flag and prompt further investigation to include neuroimaging.

## Conclusion

Spontaneous vertebral artery dissection is a rarely encountered clinical problem. In this case report, we describe a healthy 16-year-

old Caucasian male with vertigo, nausea, vomiting, blurred vision, and left sided extremity weakness. Diagnostic imaging should be considered in a young patient with an unexplained focal neurologic deficit due to the higher association of ischemic stroke and vertebral artery dissection in this population.

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