Large Highly Mobile Complex Ascending Aortic Atheroma Causing Left Middle Cerebral Artery Stroke in Patient without any History of Cardiac Disease

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Abstract

Introduction: A complex atheroma of the aortic arch puts a patient at risk for an embolic stroke. We present a patient with no cardiac history who came with acute stroke-like symptoms from a large, complex aortic atheroma.

Case presentation: A 60-year-old woman with known thoracic aortic aneurysm presented with acute right-sided weakness. An MRI of the brain showed a left middle cerebral artery (MCA) embolic stroke. A CT angiogram (CTA) showed the known, stable thoracic aneurysm and concern for type A aortic dissection. Later gated CT scan revealed a focal filling defect in the proximal aortic arch, most compatible with a floating thrombus. A transesophageal echocardiogram (TEE) then demonstrated a 18 mm by 14 mm, highly mobile, complex atheroma in the proximal aortic arch (figure 1). Both the neurology and cardiology consultants agreed that the atheroma was the etiology of the stroke, and they suggested that the patient be started on oral anticoagulation therapy with warfarin for 6 months and statin therapy for life. After discharge, a repeat CT angiogram of chest and TEE were performed after 6 months showing a stable aortic aneurysm and resolution of the floating thrombus. For at least 9 months after this episode, she has not had a stroke reoccurrence.

Discussion

Aortic plaques are common with large and mobile aortic atheromas being recognized as a potential cause of embolic events in the elderly population. These patients will benefit from an anticoagulation and statin therapy to reduce the risk of stroke recurrence.

Conclusion: A complex aortic atheroma is likely an independent risk factor for embolic stroke and may be an indication for prophylactic anticoagulation and statin therapy.

Introduction

The development of an aortic atheroma associated with carotid artery disease or atrial fibrillation is a recognized risk factor for embolic stroke. Additionally, these patients have a higher incidence of recurrent stroke and peripheral embolization. The mobility of these lesions is especially significant, as multiple observational studies demonstrate up to a 100% rate of embolization in mobile lesions. Our report presents a patient with no past medical history of coronary artery disease or stroke who developed acute stroke-like symptoms from a large, highly mobile, complex atheroma causing a left middle cerebral artery (MCA) embolic event.

Case Presentation

A 60-year-old woman presented to the emergency department (ED) with new onset right-sided weakness, short-term memory loss, blurry vision, and fatigue. Her medical history included a bicuspid aortic valve, hypertension, a stable ascending aortic aneurysm, and rheumatoid arthritis. A CT angiogram of the carotids and cranial arteries was urgently performed which proved to be clinically unremarkable. After admission, a brain MRI revealed an acute left middle cerebral artery (MCA) embolic stroke. To evaluate for a central source, a CT angiogram of chest was completed and showed concern for a type A aortic dissection. The cardiothoracic surgery consultant did not feel it was an acute dissection and suggested a gated CT scan for further evaluation. This test revealed a focal filling defect within the proximal aortic arch, most compatible with a floating thrombus. A subsequent transesophageal echocardiogram (TEE) revealed an 18 mm by 14 mm, highly mobile, complex atheroma in the proximal aortic arch (figure 1).
an estimated 43.7% prevalence in the general population, yet they are not commonly evaluated for when risk stratifying patients for stroke. Additionally, complex plaques carry a 7.6% prevalence and have the same relative risk of stroke compared to that of carotid artery disease or atrial fibrillation.\(^5,7,8\) A complex atheroma is defined as a lesion with a base ulcer, mobile nature, or size larger than 4 mm. Furthermore, location proximal to the ostium of the left subclavian artery itself further increases the risk of stroke and peripheral embolization.\(^4,9\) A TEE is a minimally invasive, low risk procedure that can be very useful in evaluating or diagnosing complex atheromas.\(^2,3\)

Stroke events from these lesions may be avoided prophylactically with anticoagulation therapy. Ferrari et al. performed a prospective cohort study showing that patients with complex aortic atheromas treated with antiplatelet therapy had significantly more embolic events and a nine-fold higher mortality compared to those on anticoagulation therapy with warfarin.\(^9\) A review published by Capmany et al. illustrated multiple studies supporting anticoagulation’s superiority to antiplatelet therapy in patients with stroke and complex aortic atheromas. They also concluded that statin therapy may reduce the relative risk of new vascular events.\(^10\) These findings are noted in ACC/AHA guidelines which recommend treatment with a statin as a reasonable option for an aortic arch atheroma (class IIa), and oral anticoagulation with warfarin or antiplatelet therapy considerations in stroke patients as secondary prevention (class IIb).\(^11\) These recommendations are vague and may not be sufficient. The FAP study found that stroke patients with a complex aortic lesion treated with antiplatelet therapy had a recurrence rate of 11.9 per 100 person-years. They also found the same results if patients were treated with anticoagulation for only 3 months followed by antiplatelet therapy.\(^11\) More research is needed to find specific therapies including length of treatment and role of NOACs for better primary stroke prevention.

**Conclusion**

Our case emphasizes that complex atheromas should be included in the differential diagnosis of embolic strokes even in patients with minimal risk factors, especially due to the devastating sequelae. Also, patients with complex aortic atheromas may benefit from prophylactic statin and anticoagulation therapy.

**Acknowledgements**

We acknowledge West Virginia University Departments of Cardiology and Internal Medicine Department for granting permission to submit this case.

**References**

7. Jones EF, Kalman JM, Calafiore P, Tonkin AM, Donnan GA. Proximal aortic atheroma: an