A Case of Cryptogenic Recurrent Cerebral Fusiform Aneurysms involving the Distal Anterior Circulation

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Background
Fusiform aneurysms are non-saccular dilatations involving the entire circumference of the arterial wall caused by traumatic dissections, infections, arteriovenous disease, and collagen vascular disorders. One of the defining features includes the communication between the true lumen and false lumen through a defect of the internal elastic lamina.3 This is thought to lead to a formation of an intramural hematoma, which may progress to disrupt the adventitia to result in subarachnoid hemorrhage. Conversely, hematomas expansion between the internal elastic lamina and the tunica media may lead to vascular stenosis/occlusion to cause ischemic stroke.2

Amongst the other etiologies with saccular aneurysms being the most common type, fusiform aneurysms represent only a small proportion of intracranial aneurysms. Furthermore, when present, these aneurysms more commonly involve the vertebrobasilar system. However, there have been case reports of patients with distal anterior cerebral aneurysms in the setting of an azygous ACA.1 Interestingly, patient’s with distal ACA territory lesions were found to have better outcomes following intervention compared to other location2.

The following case is a discussion of a 22-year-old female who presented with a subarachnoid hemorrhage due to a ruptured distal anterior cerebral fusiform aneurysm found to have recurrence on follow up.

Objective
To discuss a unique case of recurrent fusiform aneurysms involving the distal anterior cerebral circulation.

Case Report
A 22-year-old Vietnamese female with no significant past medical history presented to the emergency department with new onset seizure. Upon arrival, the patient was witnessed to have recurrent convulsions without return to baseline so she was intubated and sedated. Initial noncontrast CT head demonstrated diffuse subarachnoid hemorrhage (modified Fisher 3, Hunt & Hess 5), with an anterior interhemispheric intracerebral hemorrhage. The patient was taken for diagnostic cerebral angiogram shown below:

On outpatient follow up visit at the interventional clinic, the patient revealed that she had undergone intravascular stenting of an interval new right pericallosal artery fusiform aneurysm at a different facility approximately 9 months after her initial presentation. About 20 months after her initial presentation and 11 months after the stent placement, the patient was taken for a repeat diagnostic cerebral angiogram for further evaluation:

On the repeat study demonstrated complete obliteration of the previously seen right callosomarginal fusiform aneurysm; however, an interval new stented right pericallosal artery with fusiform dilatation measuring 2.5 x 2.5 x 9.5 mm was also seen.

Of note, the patient’s family history was negative for ischemic strokes, intracranial hemorrhages, or aneurysms. In addition, social history was largely negative with the exception of occasional marijuana; she otherwise denied any current or previous history of illicit drug abuse.

Discussion
This case discusses a rare type of intracranial aneurysm in the form of a fusiform aneurysm in a less commonly reported location of the callosomarginal branch of the ACA, further distinguished by the recurrence of a fusiform aneurysm in the pericallosal branch of the ACA. In this otherwise healthy 22-year-old female, a reasonable etiology for fusiform aneurysms could not be established despite her prolonged hospital course and continued outpatient follow up. Pertinent negatives included systemic/CNS infections, malignancies, and phenotypical manifestations of common collagen disorders.

An argument could be made that the new pericallosal fusiform aneurysm may have been the result of surgical trauma from manipulation/clipping of the nearby vessels; however, the explanation for her presenting lesion still remains unknown and though a rare cause, genetic testing for collagen vascular disorders may be warranted in such patients.

References