47-year-old female with left-sided weakness and a history of stroke and prior motor vehicle accident

Melody Chiang, BS\textsuperscript{1}, Karthik Reddy, BS\textsuperscript{1}, Nicholas H. Osborne, MD\textsuperscript{2}, J. Rajiv Bapuraj, MD\textsuperscript{3}

\textsuperscript{1}University of Michigan Medical School
\textsuperscript{2}University of Michigan, Department of Vascular Surgery
\textsuperscript{3}University of Michigan, Department of Neuroradiology
Patient Presentation

History:

• 47-year-old black female with a history of:
  • 4 months of intermittent sciatica, left-hand pain, and left-sided arm and leg weakness and numbness following a motor vehicle accident (MVA) 4 months prior
  • Patent foramen ovale
  • Stroke in R MCA distribution occurring 1 month prior and resolution of occlusion s/p IV TPA
• Presenting for evaluation of left-sided weakness and a potential source of stroke.
Patient Presentation

Physical Exam Findings:

• Finger tapping slower on the left than right
• Cranial nerves intact
• Full strength in deltoids, biceps, triceps, hip flexors, knee flexors and extensors, and foot dorsiflexors
• Normal gait
Pertinent Labs

- A1C 5 (nl 4.2-5.6%)
- LDL 72 (nl <100 mg/dL)
- HDL 77 (nl 40-60 mg/dL)
- ANA neg.
What Imaging Should We Order?
### This imaging modality was ordered by the consulting neurologist when the patient presented for evaluation of the source of the stroke.

<table>
<thead>
<tr>
<th>Variant 4: New focal neurologic defect, fixed or worsening. Longer than 6 hours. Suspected stroke.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Radiologic Procedure</strong></td>
</tr>
<tr>
<td>MRI head without IV contrast</td>
</tr>
<tr>
<td>MRI head without and with IV contrast</td>
</tr>
<tr>
<td>MRA head and neck without IV contrast</td>
</tr>
<tr>
<td>MRA head and neck without and with IV contrast</td>
</tr>
<tr>
<td>CT head without IV contrast</td>
</tr>
<tr>
<td>CTA head and neck with IV contrast</td>
</tr>
<tr>
<td>Arteriography cervicocerebral</td>
</tr>
<tr>
<td>CT head perfusion with IV contrast</td>
</tr>
<tr>
<td>MRI head perfusion with IV contrast</td>
</tr>
<tr>
<td>CT head with IV contrast</td>
</tr>
<tr>
<td>CT head without and with IV contrast</td>
</tr>
<tr>
<td>US duplex Doppler carotid</td>
</tr>
</tbody>
</table>

**Rating Scale:** 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

**RRL:** Relative Radiation Level

---

Upon initial admission for treatment of suspected stroke 1 month prior to the current presentation, the patient had already received imaging confirming stroke in R MCA territory and appropriate treatment.
Confirmation of subacute infarction in the right basal ganglia extending into the external capsule.
CTA Findings (unlabeled)
An incomplete shelf-like projection in the lumen of the carotid is visible on both the R and L sides, suggesting the presence of bilateral incomplete carotid webs.
Carotid US with Doppler was ordered for confirmation of character of filling defect
A thin echogenic flap is present at the left carotid bifurcation.
Left Carotid US with Doppler Findings (unlabeled)
Left Carotid US with Doppler Findings (labeled)

Turbulent flow observed in the area of the false lumen created by the flap.
Final Dx:

Bilateral carotid webs
Case Discussion

- **Demographics** - young patients, female and African American predominant (median age: 40.5y, IQR: 34-55y)\(^1\)

- **Definition** - thought to be a rare variant of fibromuscular dysplasia\(^2\)
  - Carotid webs are associated with a disturbed flow that might stimulate thrombus formation\(^3\)

- **Presentation** - ischemic stroke\(^1,4\) and pain in settings of trauma\(^4\)

- **Radiographic features** - usually a linear filling defect at the posterior aspect of the carotid bulb\(^4\)
  - 22% of patients identified in a systematic review had bilateral carotid webs\(^5\)
Case Discussion

• Carotid webs have a 2.3% prevalence in the United States\textsuperscript{6}
  • Incidence of cryptogenic stroke associated with carotid web is 3.8 per 100,000 person years\textsuperscript{7}

• Carotid webs are an important cause of cryptogenic stroke
  • Carotid webs seem to affect young, Black, and female patients in a higher proportion

• Management:
  • Varied familiarity overall across subspecialities\textsuperscript{8}
  • CTA was the preferred imaging modality\textsuperscript{8}
  • Single (aspirin-only) or dual antiplatelet therapy were the most common management modalities\textsuperscript{8}
  • Intervention (stent or endarterectomy) favored in recurrent strokes\textsuperscript{8}
Patient Outcome

• Patient placed on anticoagulation (rivaroxaban) and continued aspirin for stroke prophylaxis

• No need for statin for secondary stroke prevention, given underlying arteriopathy
  • Patient did not tolerate the previous trial of statin

• Plan for repeat CTA in 1 year
References: