AMSER Case of the Month March 2025

48 y/o male presents with right sided headache, dysphagia, dysphonia, and right shoulder weakness

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Clinical Information

- HPI: 48-year old man presents to the ED with severe right sided headache, nausea, vomiting, dysphagia, dysphonia, and right shoulder weakness
- PMHx: No pertinent past medical history
- Social History: 25 pack year smoking history
- Vitals: BP: 184/124 HR: 78 Temp: 36.7 RR: 16 SpO2: 100%
- Physical Exam: Cranial nerve deficits present. Right vocal cord paralysis on flexible laryngoscopy (CN X). Asymmetric palate elevation with immobile right soft palate (CN X). Unable to fully elevate right shoulder (CN XI). Tongue and uvula deviated rightward (CN XII).

Clinical Question and/or Clinical Differential Diagnosis

- What is the reason for this patient's headache, dysphagia, dysphonia, and right arm weakness?
- Differential Diagnosis:
  - Ischemic or hemorrhagic stroke
  - Demyelinating disease
  - Infectious/Inflammatory etiologies (e.g., Lyme disease, neurosarcoidosis)
  - Cranial nerve impingement
    - Neoplastic – skull base mass (e.g., schwannoma, paraganglioma, metastasis)
    - Non-neoplastic – aneurysm/pseudoaneurysm, dissection

What Imaging Should We Order?

ACR Appropriateness Criteria for the Indication

Variant 9: **Multiple different lower cranial nerve palsies or combined lower cranial nerve syndromes (CN IX-XII). Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI head without and with IV contrast	Usually Appropriate	O
MRI orbits face neck without and with IV contrast	Usually Appropriate	O
CT neck with IV contrast	Usually Appropriate	☢☢☢
MRA head and neck with IV contrast	May Be Appropriate	O
MRA head and neck without and with IV contrast	May Be Appropriate	O
MRA head and neck without IV contrast	May Be Appropriate	O
MRI head without IV contrast	May Be Appropriate	O
MRI orbits face neck without IV contrast	May Be Appropriate	O
CT neck without IV contrast	May Be Appropriate	☢☢☢
CTA head and neck with IV contrast	May Be Appropriate	☢☢☢
US neck	Usually Not Appropriate	O
MRI head with IV contrast	Usually Not Appropriate	O
MRI orbits face neck with IV contrast	Usually Not Appropriate	O
CT maxillofacial with IV contrast	Usually Not Appropriate	☢☢
CT maxillofacial without IV contrast	Usually Not Appropriate	☢☢
CT head with IV contrast	Usually Not Appropriate	☢☢☢
CT head without and with IV contrast	Usually Not Appropriate	☢☢☢
CT head without IV contrast	Usually Not Appropriate	☢☢☢
CT maxillofacial without and with IV contrast	Usually Not Appropriate	☢☢☢
CT neck without and with IV contrast	Usually Not Appropriate	☢☢☢
CT temporal bone with IV contrast	Usually Not Appropriate	☢☢☢
CT temporal bone without and with IV contrast	Usually Not Appropriate	☢☢☢
CT temporal bone without IV contrast	Usually Not Appropriate	☢☢☢
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	☢☢☢☢

ACR Appropriateness Criteria for the Indication

Variant 7: **Headache with one or more of the following "red flags": increasing frequency or severity, fever or neurologic deficit, history of cancer or immunocompromise, older age (>50 years) of onset, or posttraumatic onset. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI head without and with IV contrast	Usually Appropriate	O
MRI head without IV contrast	Usually Appropriate	O
CT head without IV contrast	Usually Appropriate	☢☢☢
Arteriography cervicocerebral	Usually Not Appropriate	☢☢☢
MRA head with IV contrast	Usually Not Appropriate	O
MRA head without and with IV contrast	Usually Not Appropriate	O
MRA head without IV contrast	Usually Not Appropriate	O
MRI head with IV contrast	Usually Not Appropriate	O
MRV head with IV contrast	Usually Not Appropriate	O
MRV head without and with IV contrast	Usually Not Appropriate	O
MRV head without IV contrast	Usually Not Appropriate	O
CT head with IV contrast	Usually Not Appropriate	☢☢☢
CT head without and with IV contrast	Usually Not Appropriate	☢☢☢
CTA head with IV contrast	Usually Not Appropriate	☢☢☢
CTV head with IV contrast	Usually Not Appropriate	☢☢☢

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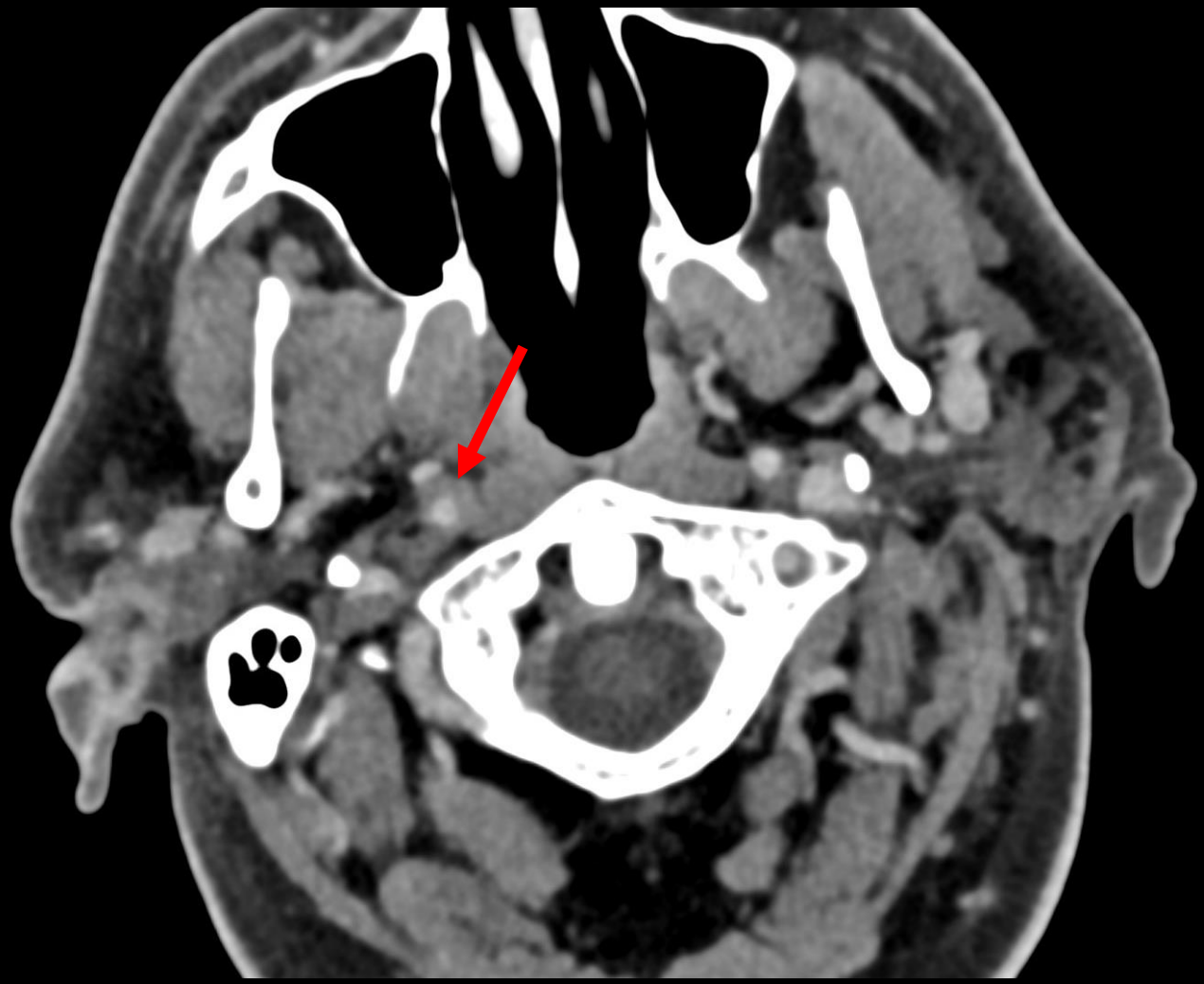
Initial Imaging Findings

- During the patient's initial imaging work-up at the outside ED, an unenhanced CT head and CTA head and neck were performed. These were reported as normal, but unfortunately, are not available for review. He was referred to an ENT surgeon as an outpatient due to his aforementioned dysphonia and dysphagia. Given his constellation of clinical findings and reported prior negative head CT and CTA head/neck, a CT temporal bones with contrast was requested

CT Temporal Bone with Contrast ordered by ENT as initial imaging (unlabeled)

CT Temporal Bone with Contrast ordered by ENT as initial imaging (labeled)

- Findings highly suspicious for dissection of the extracranial right internal carotid artery with potential extension into the petrous segment (red arrow)
- Luminal narrowing of the extracranial right internal carotid
  artery up to the petrous segment



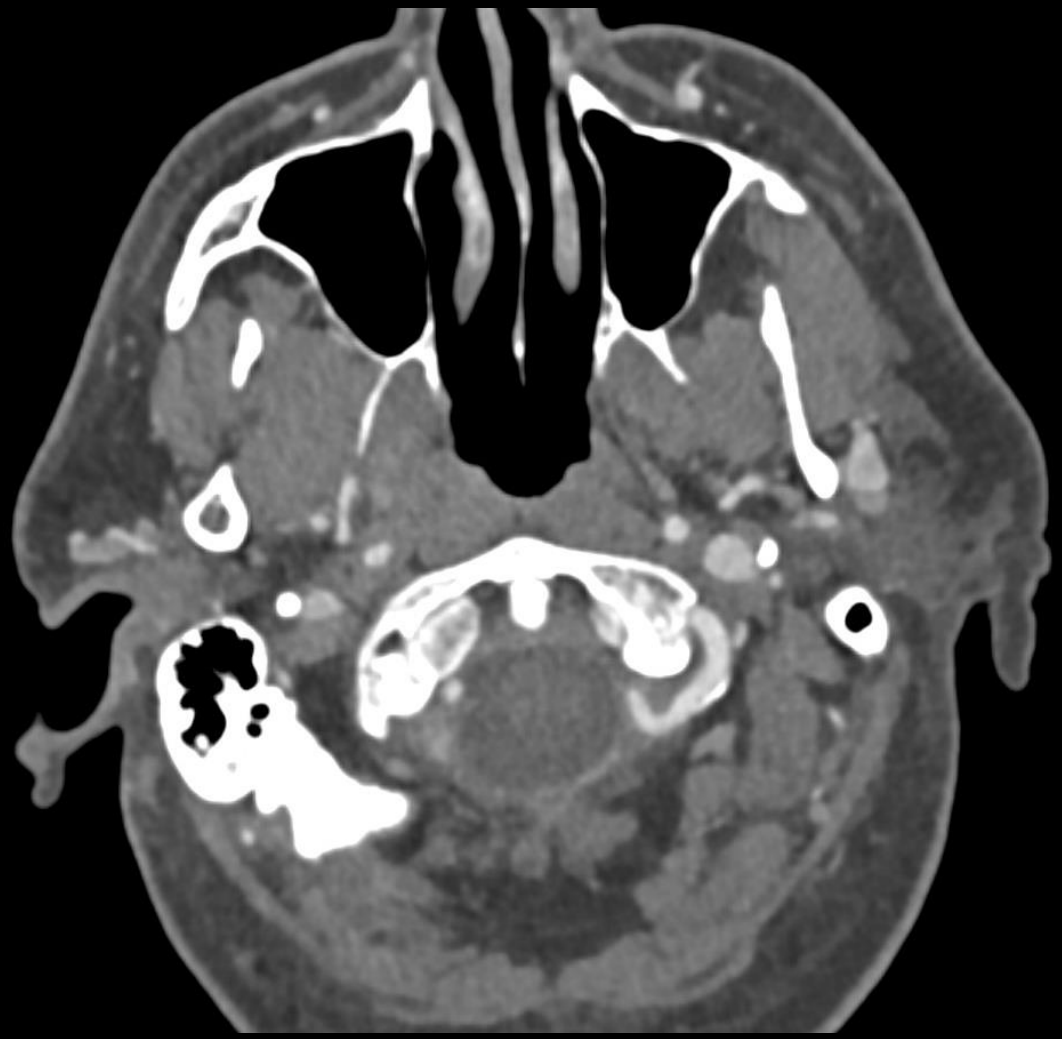
What Imaging Should We Order Now?

ACR Appropriateness Criteria for the Indication

Variant 11: **Adult. Suspected cervical vascular dissection or injury. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
MRA neck without and with IV contrast	Usually Appropriate	O
MRA neck without IV contrast	Usually Appropriate	O
CT head without IV contrast	Usually Appropriate	☢☢☢
CTA neck with IV contrast	Usually Appropriate	☢☢☢
MRA head without IV contrast	May Be Appropriate	O
MRI head without IV contrast	May Be Appropriate	O
CTA head with IV contrast	May Be Appropriate	☢☢☢
US duplex Doppler carotid artery	Usually Not Appropriate	O
US duplex Doppler transcranial	Usually Not Appropriate	O
Arteriography cervicocerebral	Usually Not Appropriate	☢☢☢
MRA head without and with IV contrast	Usually Not Appropriate	O
MRI head perfusion with IV contrast	Usually Not Appropriate	O
MRI head without and with IV contrast	Usually Not Appropriate	O
MRV head without and with IV contrast	Usually Not Appropriate	O
MRV head without IV contrast	Usually Not Appropriate	O
CT head perfusion with IV contrast	Usually Not Appropriate	☢☢☢
CT head with IV contrast	Usually Not Appropriate	☢☢☢
CT head without and with IV contrast	Usually Not Appropriate	☢☢☢
CTV head with IV contrast	Usually Not Appropriate	☢☢☢

CTA Head Neck (unlabeled)

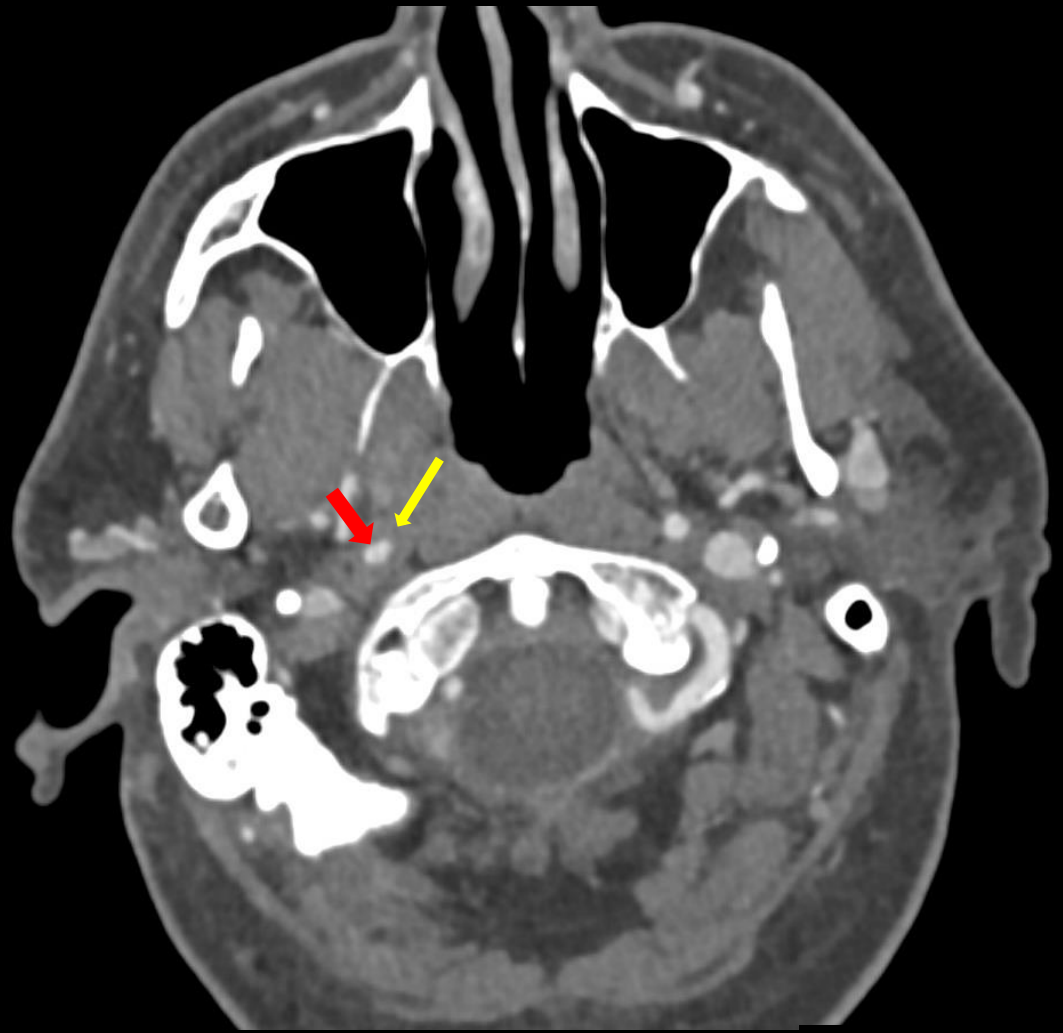


Luminal Irregularity

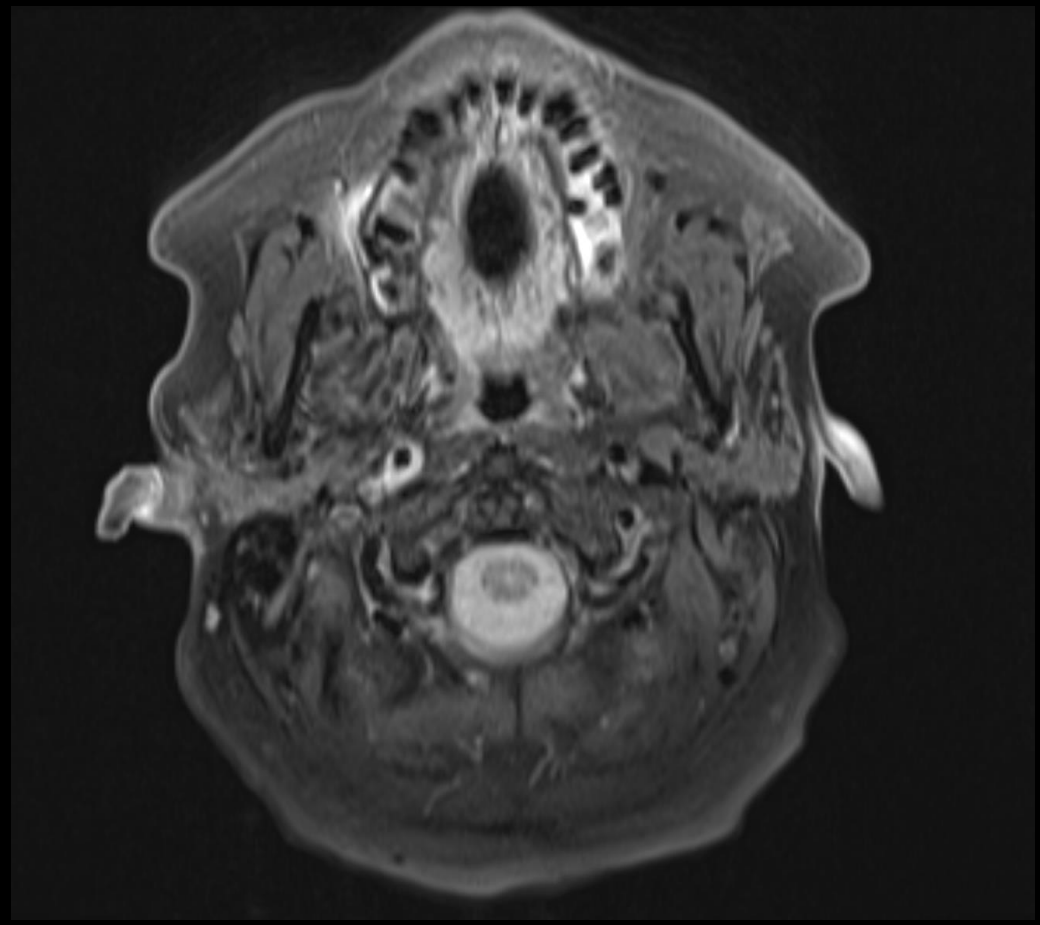
Intramural hematoma

CTA Head Neck (labeled)

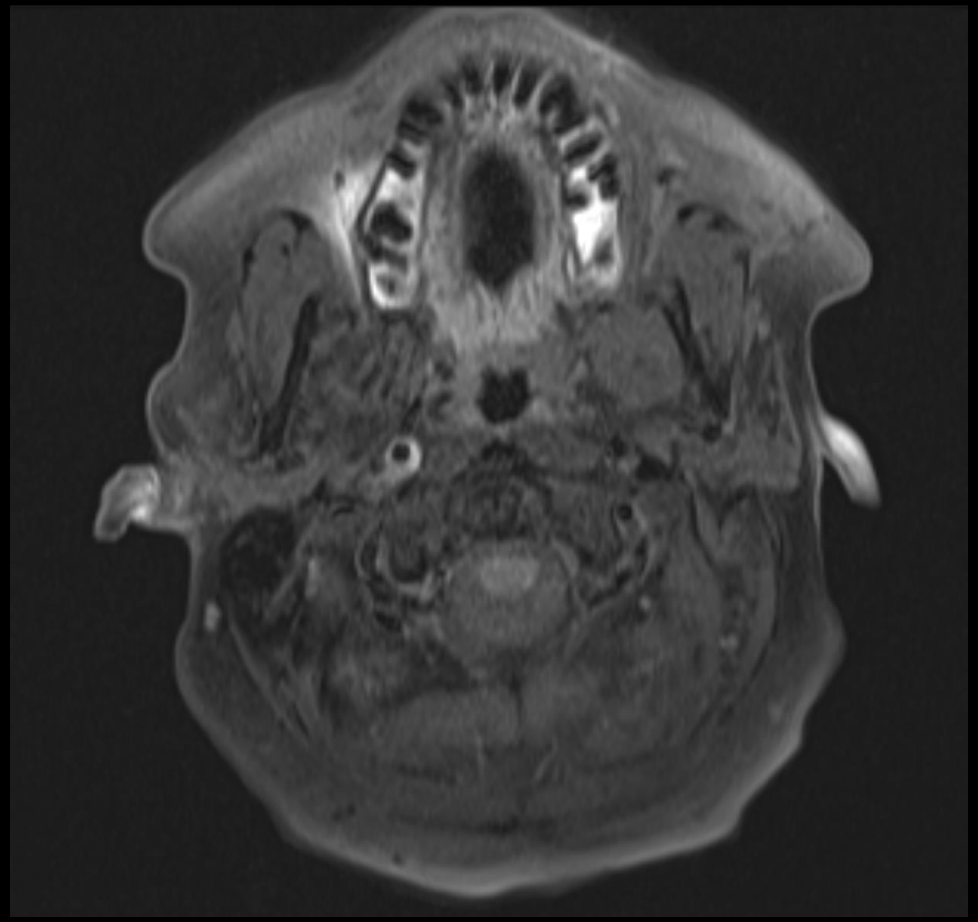
- Irregularity and mild narrowing of the distal cervical segment of the right internal carotid artery (red arrow)
- Soft tissue thickening surrounding the vessel (yellow arrow).



MRA Neck PD Axial (unlabeled)

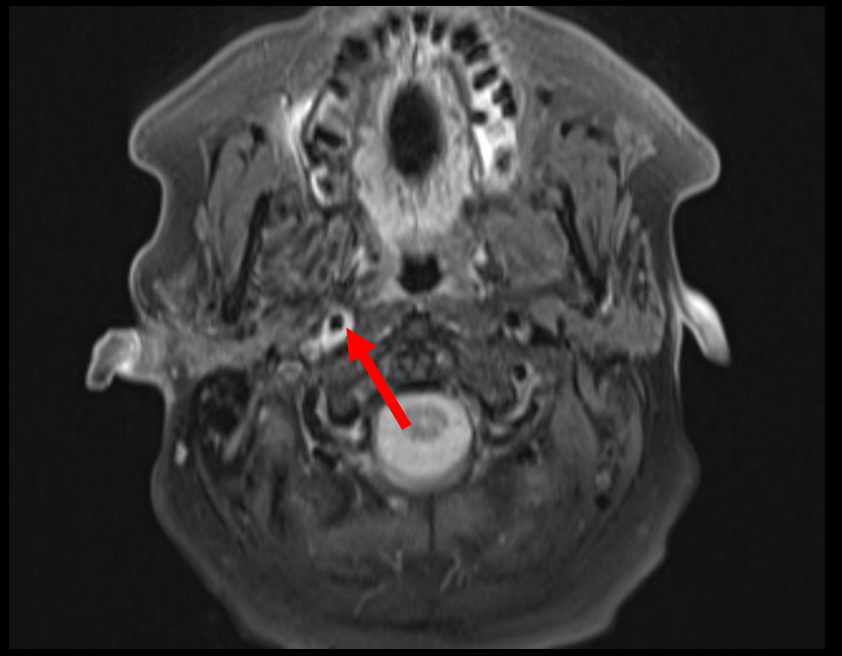


MRA Neck T1 Axial (unlabeled)

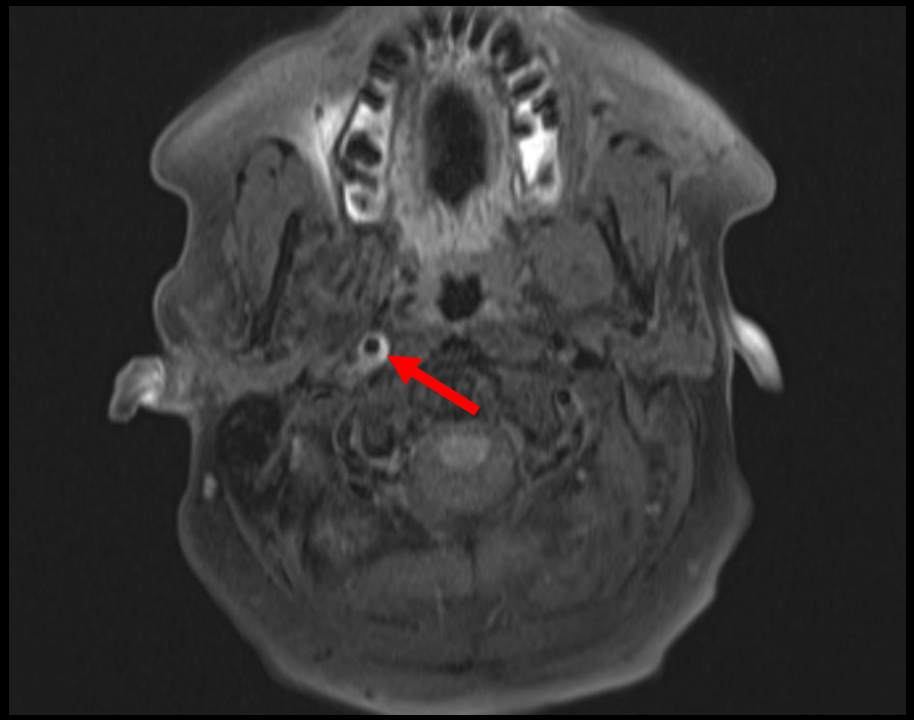


MRA Neck (labeled)

- Circumferential T1 and proton density hyperintensity along the periphery of the right distal cervical ICA to the level of the skull base/petrous segment with associated mild luminal narrowing, consistent with intramural hematoma
- Crescent-shaped area of intramural hematoma (red arrows).
- Crescentic signal contributes to mild luminal narrowing .



PD Axial



T1 Axial

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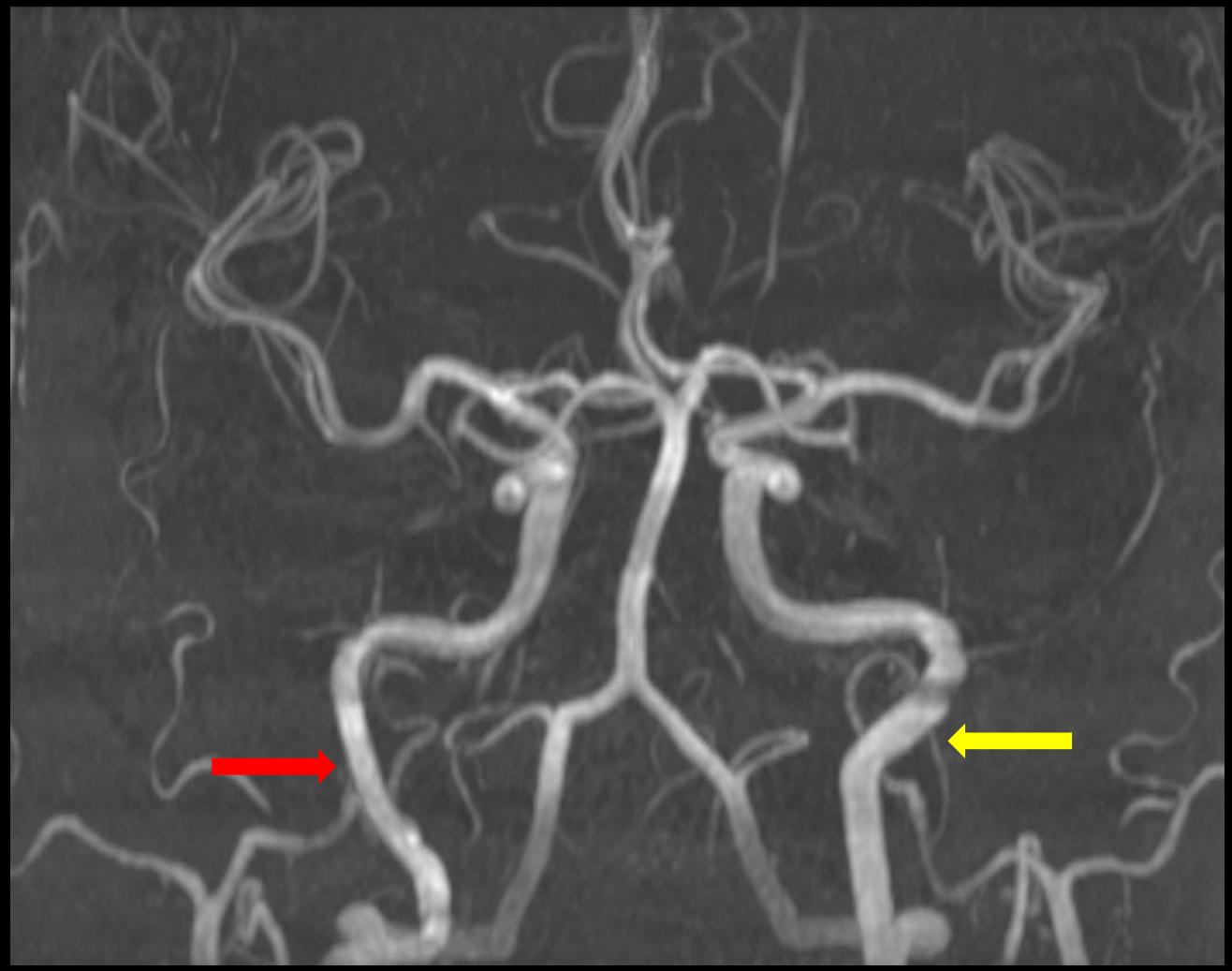
MRA Head Coronal MIP (unlabeled)

MRA Head Coronal MIP (labeled)

- 3D rendering shows mild luminal narrowing of the right distal cervical internal carotid artery (red arrow) relative to the left distal cervical internal carotid artery (yellow arrow).



Final Diagnosis

Spontaneous right distal cervical internal carotid artery dissection resulting in multiple cranial neuropathies (CN IX-XII, Collet-Sicard syndrome)

Collet-Sicard Syndrome

An uncommon entity consisting of multiple ipsilateral lower cranial nerve palsies (CN IX-XII). There are both neoplastic and non-neoplastic etiologies with this case an example of Collet-Sicard syndrome resulting from cervical carotid dissection.

Treatment Guidelines (for carotid dissection)

- **Conservative**: Antiplatelet therapy (with/without anticoagulation)
- Patient was initially started on Aspirin 325 mg reducing to a dose of 81 mg daily for a minimum of 6 months for thromboprophylaxis
- Patient was started on Atorvastatin 40 mg daily
- Vascular/Endovascular treatment not required
  - Expected to resolve without intervention
- Repeat CTA in 3 month for interval recanalization

Symptomatic Treatment

- Right Shoulder pain: Baclofen 5mg TID and Voltaren gel TID and referral to Physical therapy
- Dysphagia- Referral to ENT for barium swallow, possible vocal cord injection, referral to speech language pathologist

References

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