



THE WARREN ALPERT
Medical School
BROWN UNIVERSITY

Rhode Island STROKE SYMPOSIUM

A Pain in the Neck: Vascular Causes of Neck Pain
in the Emergency Department

Samuel Goldman, MD MPH
Assistant Professor of Emergency Medicine
Warren Alpert Medical School
Brown University

DISCLOSURE

I have no relevant financial relationships to disclose

This talk will not include any off-label discussion

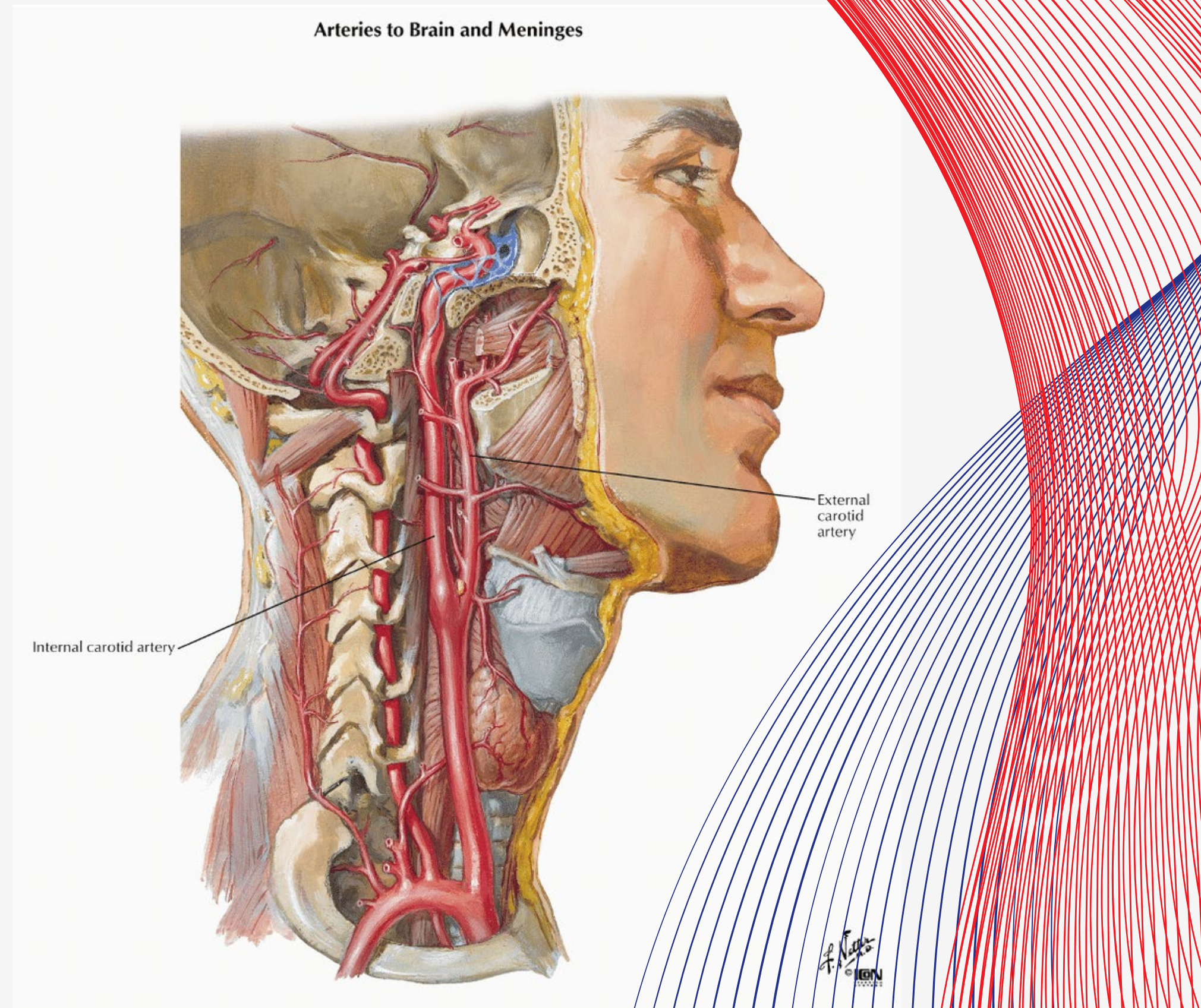


Neck Pain: An Emergency Department Consideration

- ~2.2% of ED visits
 - Estimated incidence of neck pain over 1-year period is ~20%
 - Challenge of discerning benign source from debilitating or life-threatening condition
-

Vascular etiology of neck pain is relatively rare

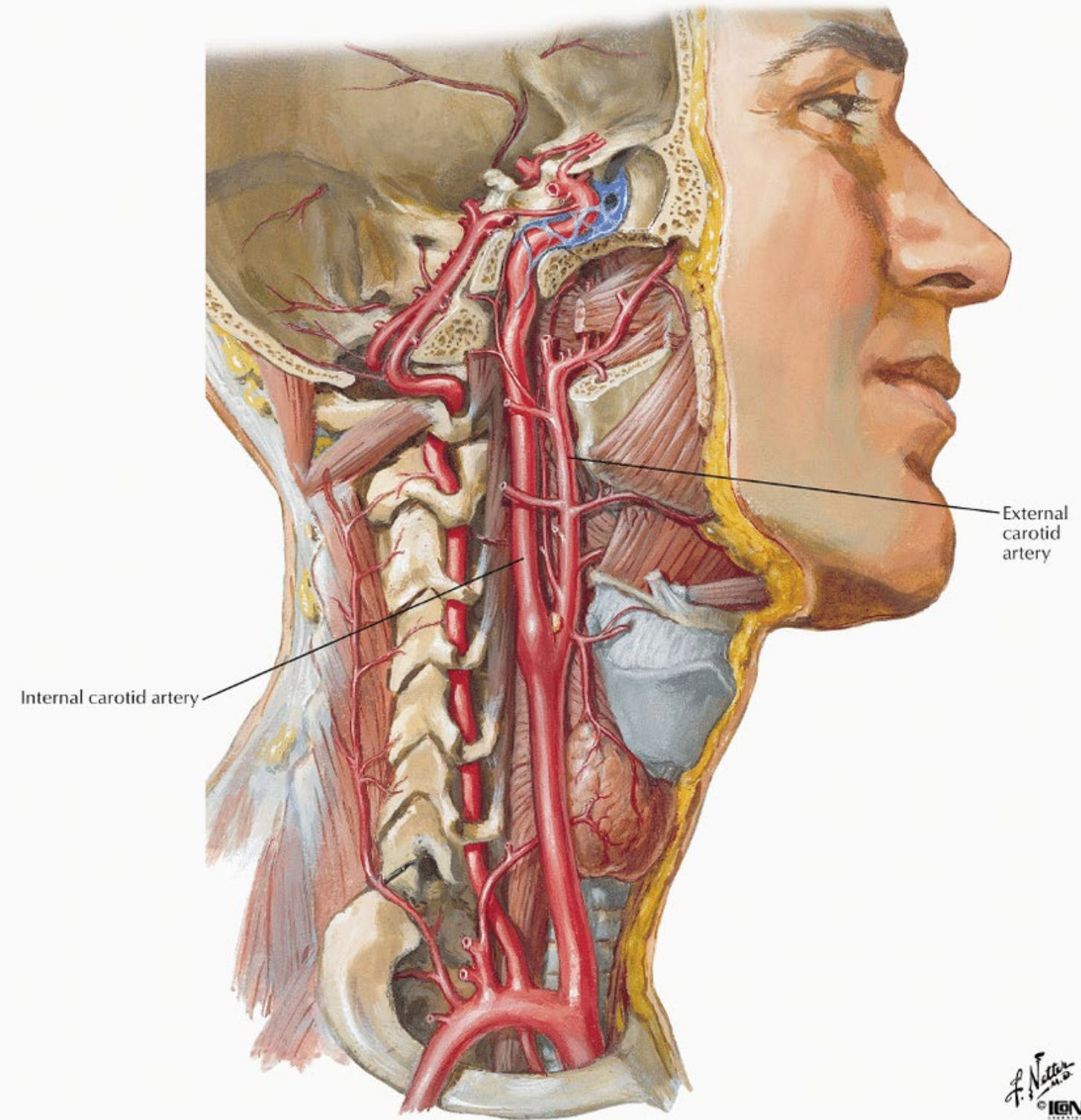
History, Mechanism, and Risk Factors are important in distinguishing between benign and concerning



Vascular causes of neck pain to consider:

- Traumatic v Spontaneous
- Anatomical/Structural
- Inflammatory
- Thromboembolic
- Infectious

Arteries to Brain and Meninges





Case 1: 44y M with left sided neck pain

- Onset 2 days ago
 - Dull left sided anterior neck pain, ringing in his left ear, and left eye appears “droopy.”
 - Loves roller coasters
 - Unknown Family Hx
-



Case 1: 44y M with left sided neck pain

- Vital signs: BP: 138/62, RR: 12, P: 80, T: 36.0, O2: 98% RA.
- GCS15
- Alert and attentive
- Left eye ptosis present
- Left eye miosis present
- No nystagmus
- 5/5 motor x4
- SILT x 4
- Negative Romberg, normal gait

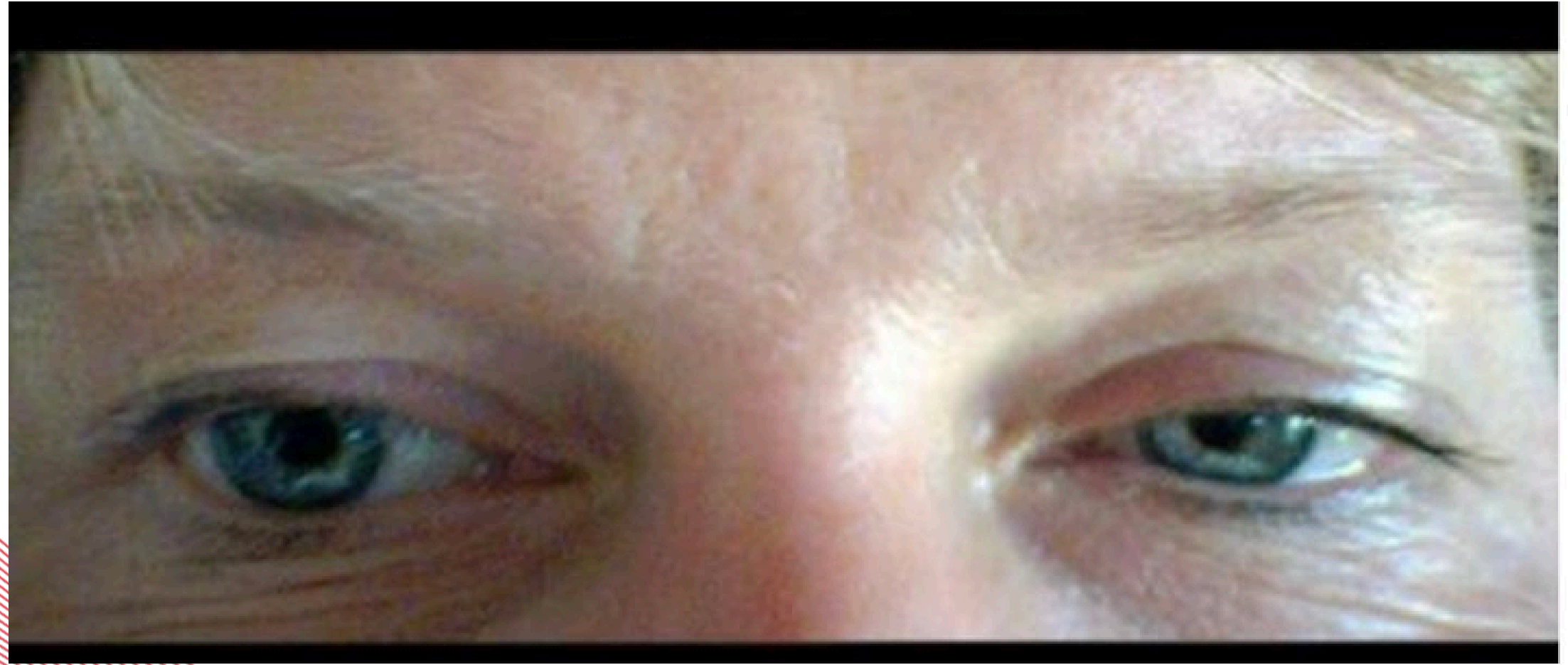
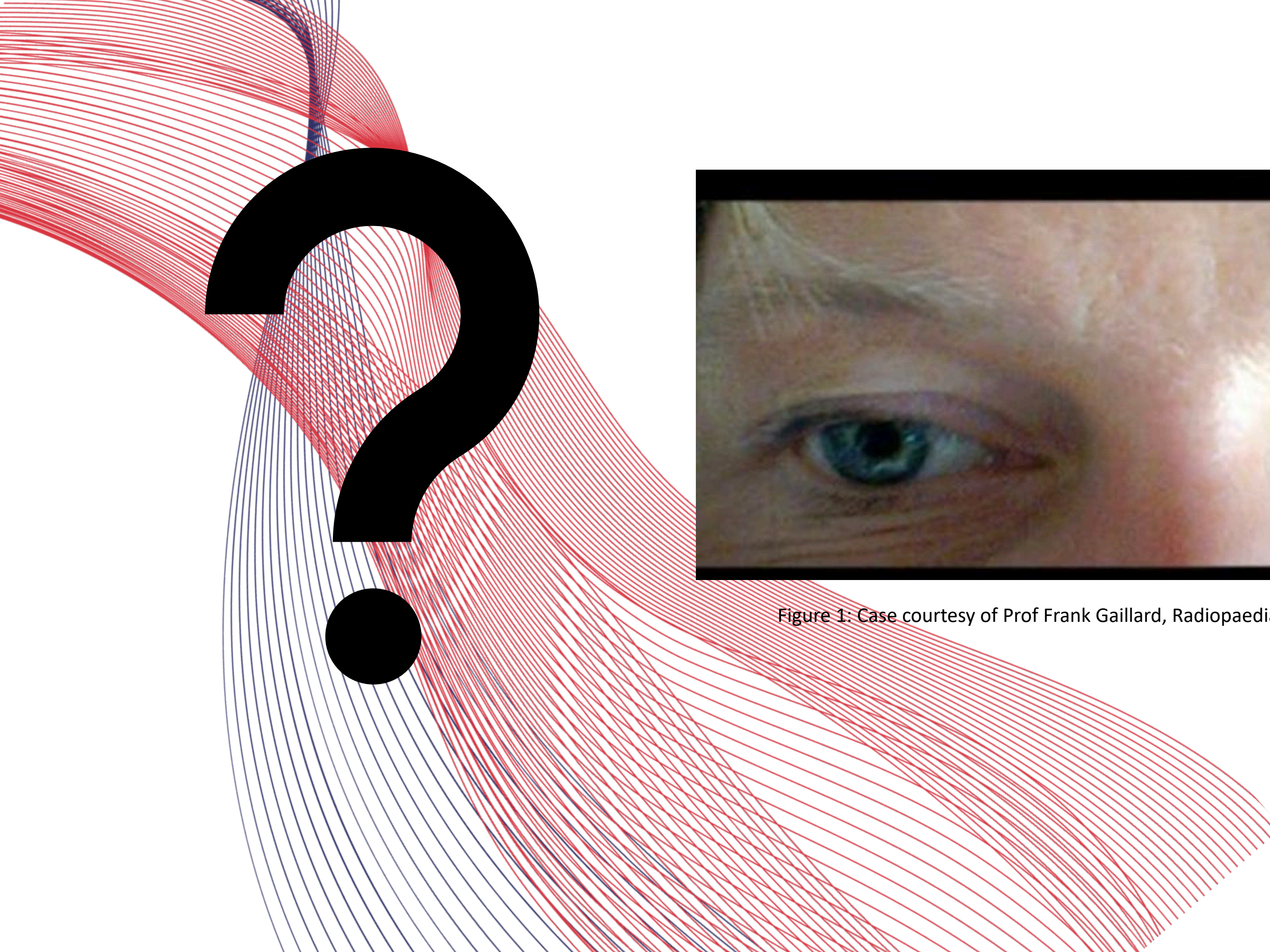
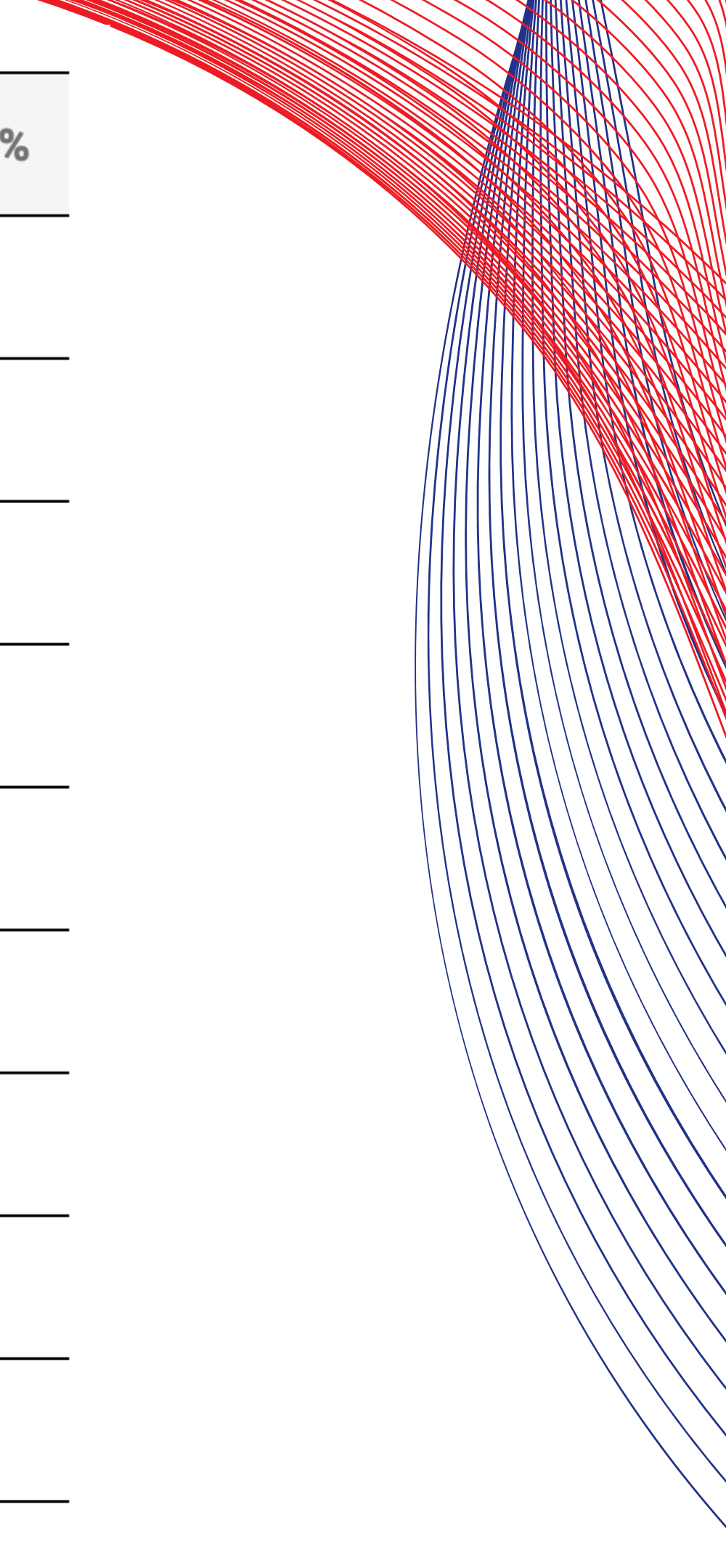


Figure 1: Case courtesy of Prof Frank Gaillard, [Radiopaedia.org/cases/6693](https://radiopaedia.org/cases/6693). rID: 6693

Cervical Artery Dissection

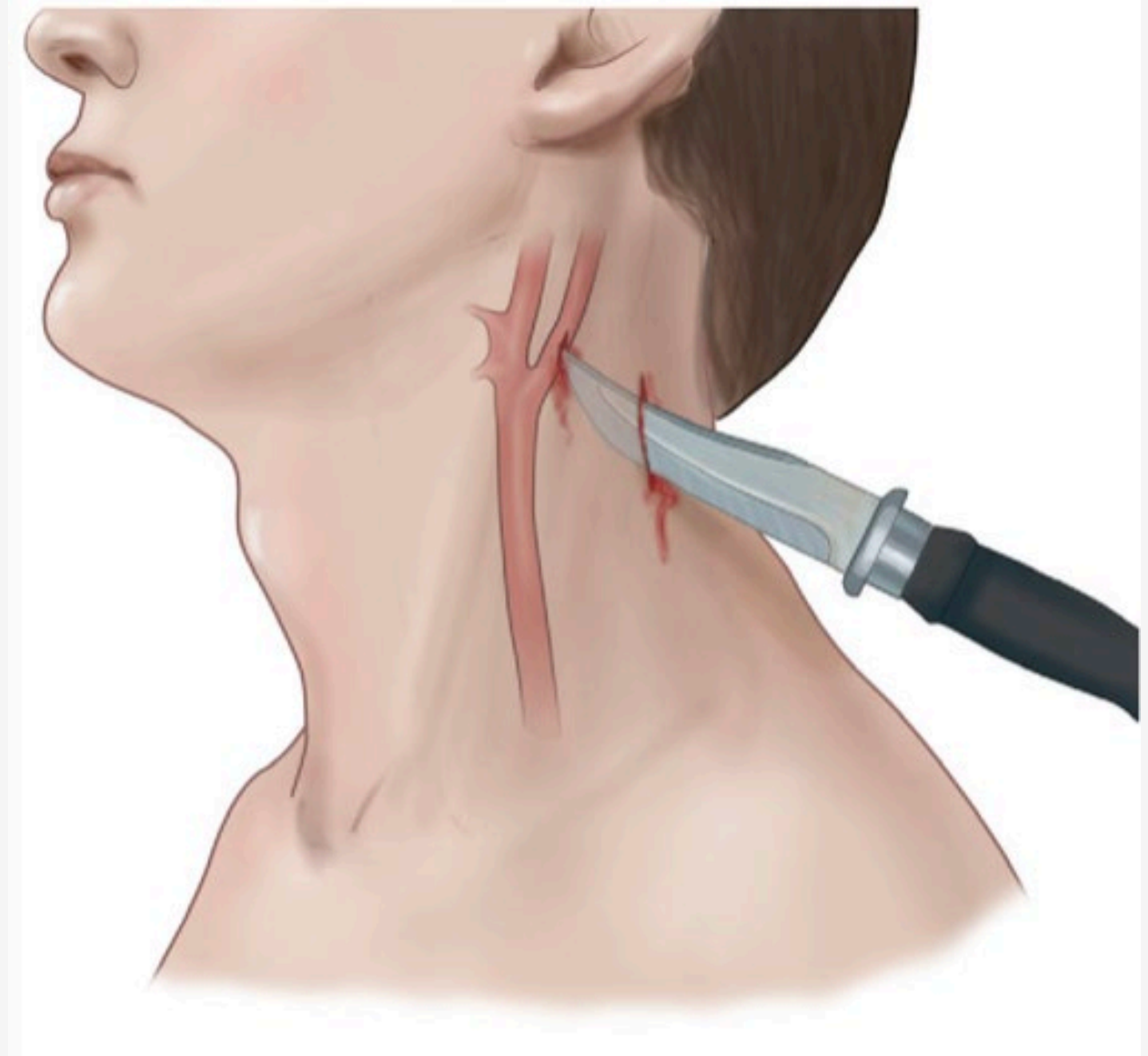
- Relatively rare 2.6-2.9 per 100,000 population annually
- Most common in ages 35-50y
- Male predominance
- Women tend to be younger -- 42.5y(F) vs 47.5y(M)
- Accounts for 20-25% of strokes in patients under the age of 45y
- First 2 weeks of disease process = highest risk of stroke
- Seasonal variation; > in winter
- Classified based on artery involved

Risk Factor in Order of Most to Least Common	Dissection Event, %
Recent trauma	40–64
Vascular anomaly	39
Current or past smoker	30
Migraine	23
High total cholesterol	23
Recent infection	22
Hypertension	19
Oral contraception	11
Family history of stroke	9



More Acutely Traumatic
causes of vascular neck pain

- Blunt traumatic = concern
for **Dissection**



Traumatic causes of vascular neck pain

- Imaging modalities for Blunt cervical vascular injuries (BCVI)

**Indications for CTA

- Arterial hemorrhage from nose/mouth/neck
- Expanding cervical hematoma
- Carotid bruit pt age <50y
- Focal neurologic deficit
- Stroke seen on CT or MR
- Neurologic deficit not explained by CT findings

Traumatic causes of vascular neck pain

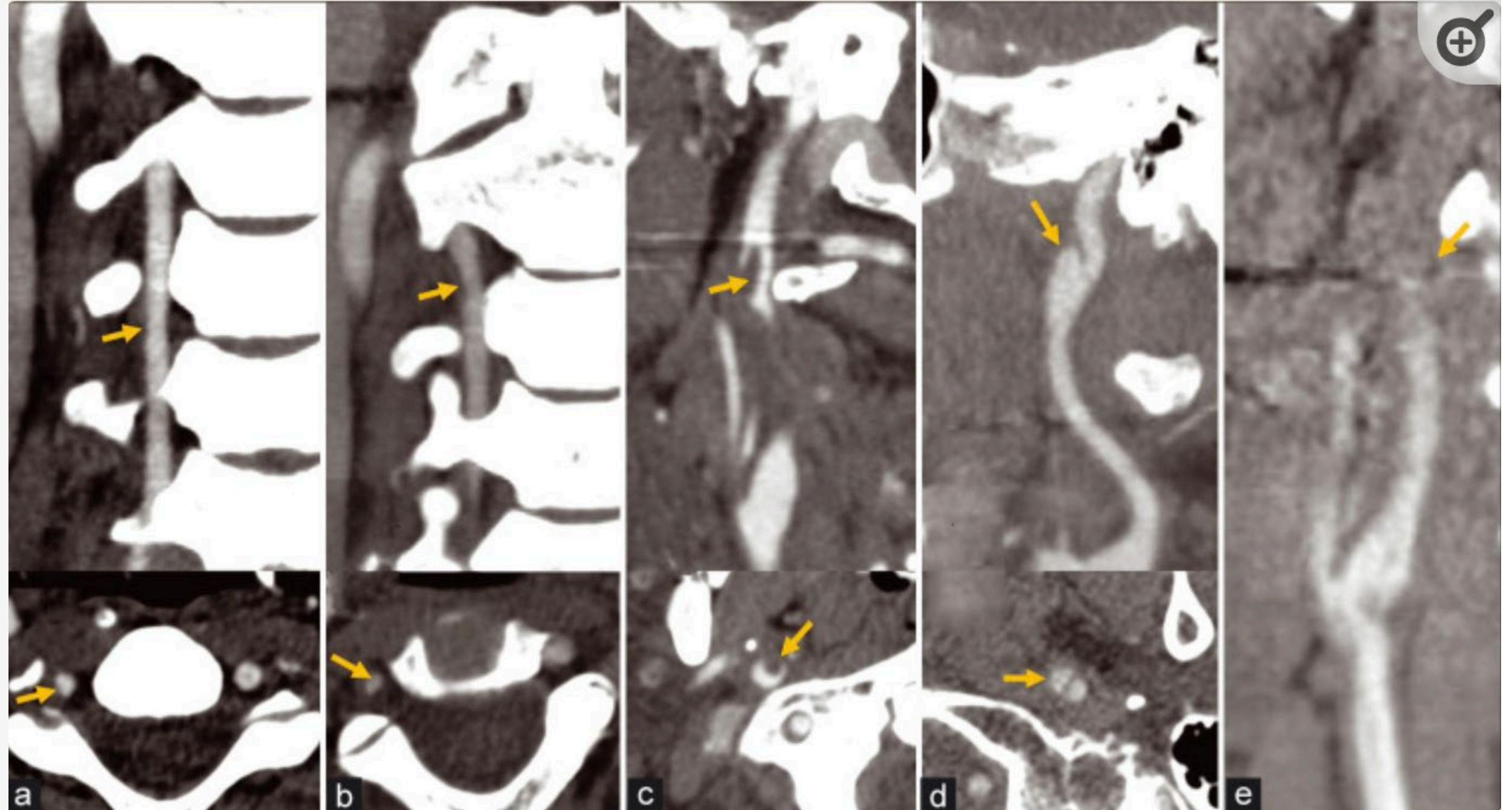
- Imaging modalities for Blunt cervical vascular injuries (BCVI)

****Consider CTA for those with Risk Factors for BCVI**

- Cervical vertebral body fracture or transverse foramen fractures
- Subluxation or ligamentous injury
- Fractures c1 -c3
- Lefort II or III fractures
- Ct finding of DAI and GCS<6
- Basilar skull fractures traversing carotid canal
- Near hanging with anoxia
- Seatbelt sign with associated pain/swelling/AMS

- Grading of traumatic dissection injuries

****Denver Scale**



Patel et al. Vascular Trauma in the Head and Neck and Endovascular Neurointerventional Management. J Clin Imaging Sci. 2020; 10:44.



Case 2: 23Y F with right sided neck pain

- Acute worsening since yesterday
 - Recent pharyngitis
 - No PMHx
 - No significant family Hx
-



Case 2: 23Y F with right sided neck pain

- BP: 91 /49, HR: 130, T: 102.2F, RR: 25, SpO2: 91% on RA
- Uvula midline
- Soft mouth floor
- Prominent lymphadenopathy
- No voice changes
- Tolerating secretions
- Neck is red, tender, swelling over right antero/lateral neck

Lemierre's Syndrome

- Rare 3.6 per 1,000,000 population annually
- Most common in ages 15-24y
- Hematogenous translocation of bacteria, typically oropharyngeal source
- Preceding sources include tonsillitis (37%), pharyngitis (30%)
- Microbiology includes:
 - *Fusobacterium necrophorum* (30%)
 - *Fusobacterium nucleatum*
 - Strep
 - Staph
 - *Klebsiella*



Lemierre's Syndrome

- Diagnosis: CT w IV contrast
- Classic Triad:
 1. Pharyngitis
 2. Anterior Neck Swelling/Tenderness
 3. Non-Cavitary pulmonary infiltrates
- 97% have concurrent cough
- 11-49% Jaundiced
- Hepatosplenomegaly
- 3% cases complicated by meningitis
- Anticoagulation is controversial





Case 3: 57y F with left sided neck pain

- 3 weeks of symptoms
 - Moderate intensity left sided neck pain located over the carotid artery
 - Accompanied by local tenderness
 - Worse with head and neck movement
-



Case 3: 57y F with left sided neck pain

- No preceding symptoms
 - No associated headaches, syncope or neurologic deficits.
 - Had outpatient ultrasound which prompted ED visit
-

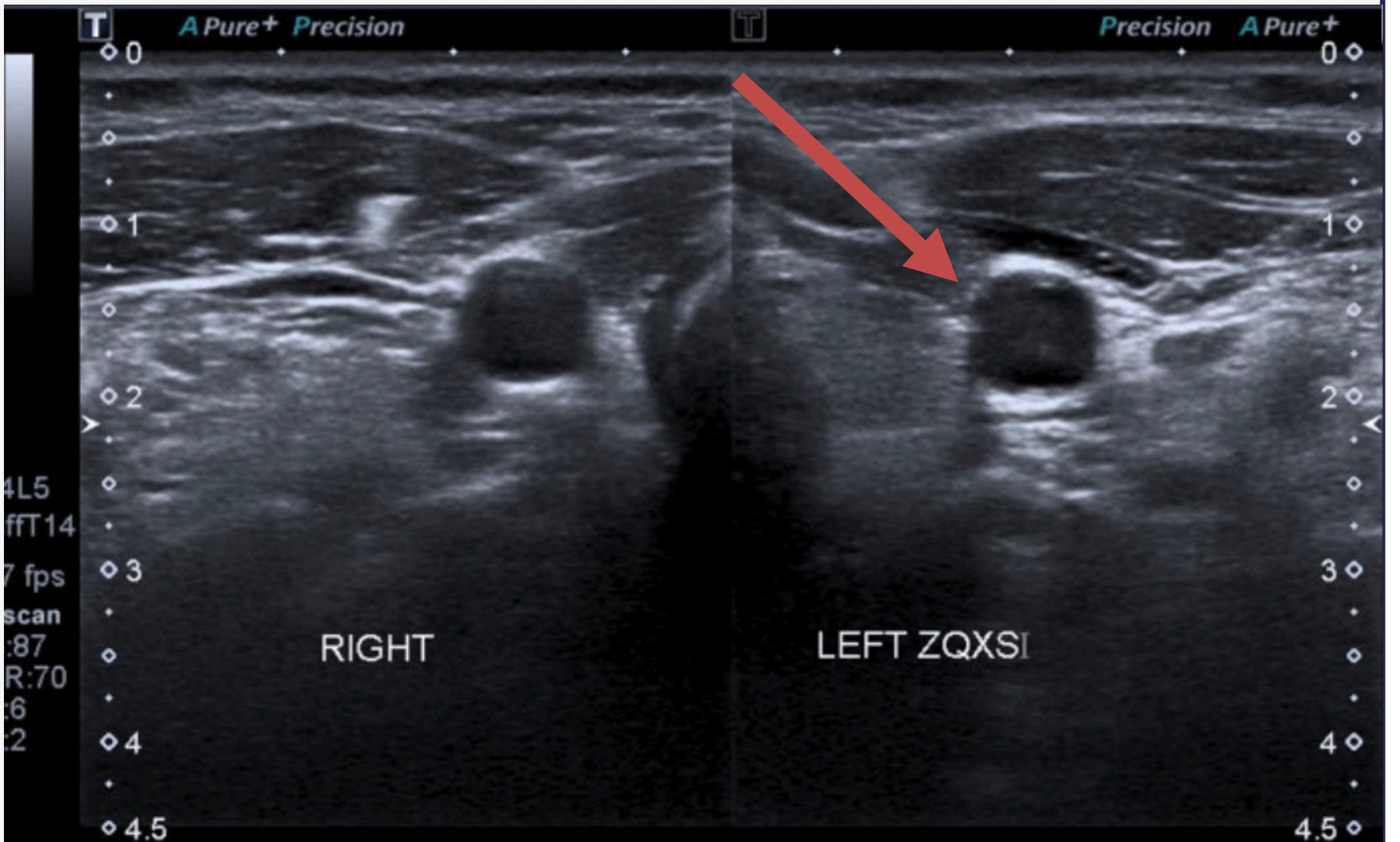


Case 3: 57y F with left sided neck pain

- Benign exam
 - Focally tender over carotid
 - Labwork without concerning findings
-

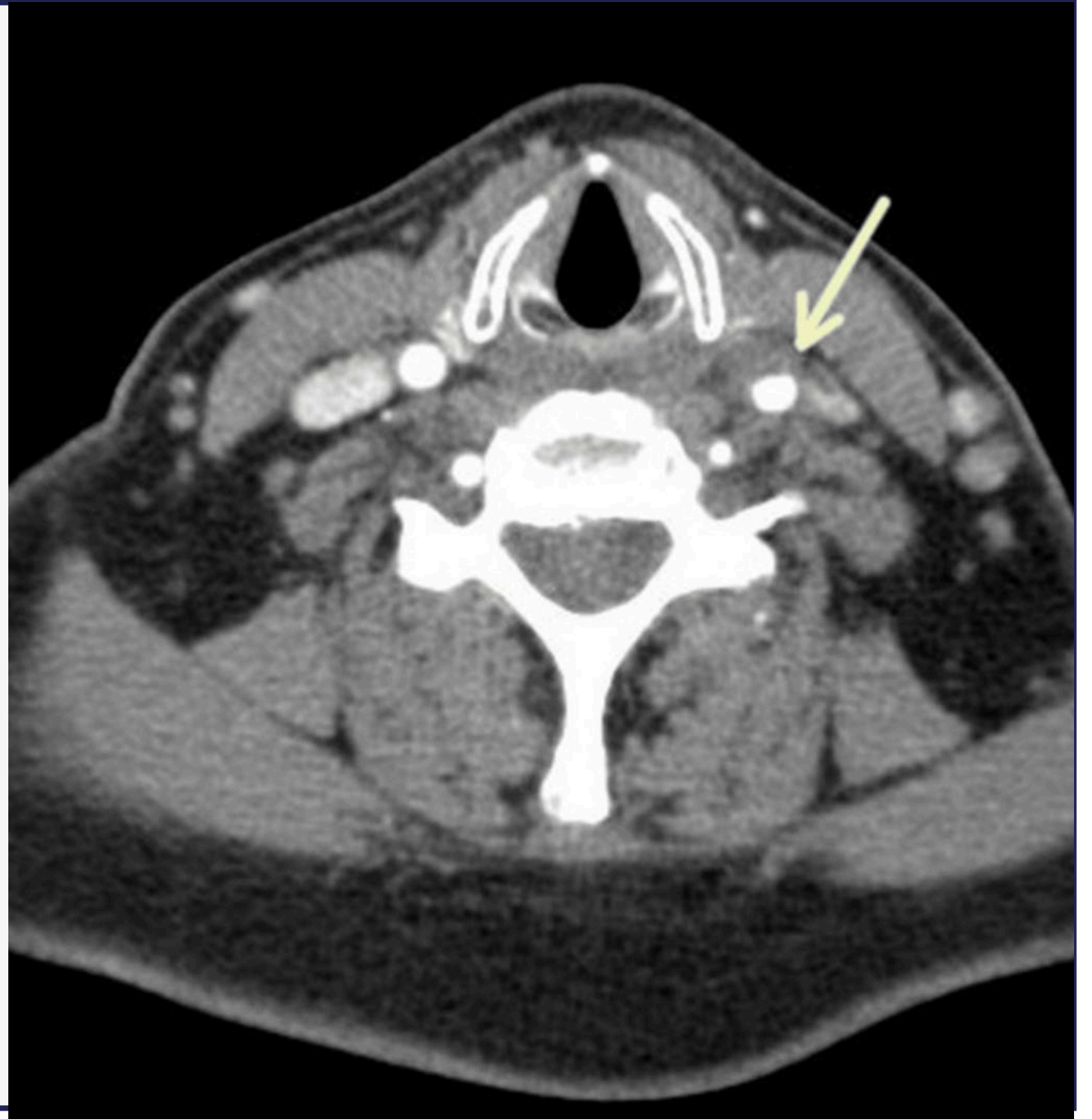
Ultrasound

- Focal parietal enlargement of the common carotid artery and hyperechogenicity of the periaortic tissue
- Concern for inflammatory process



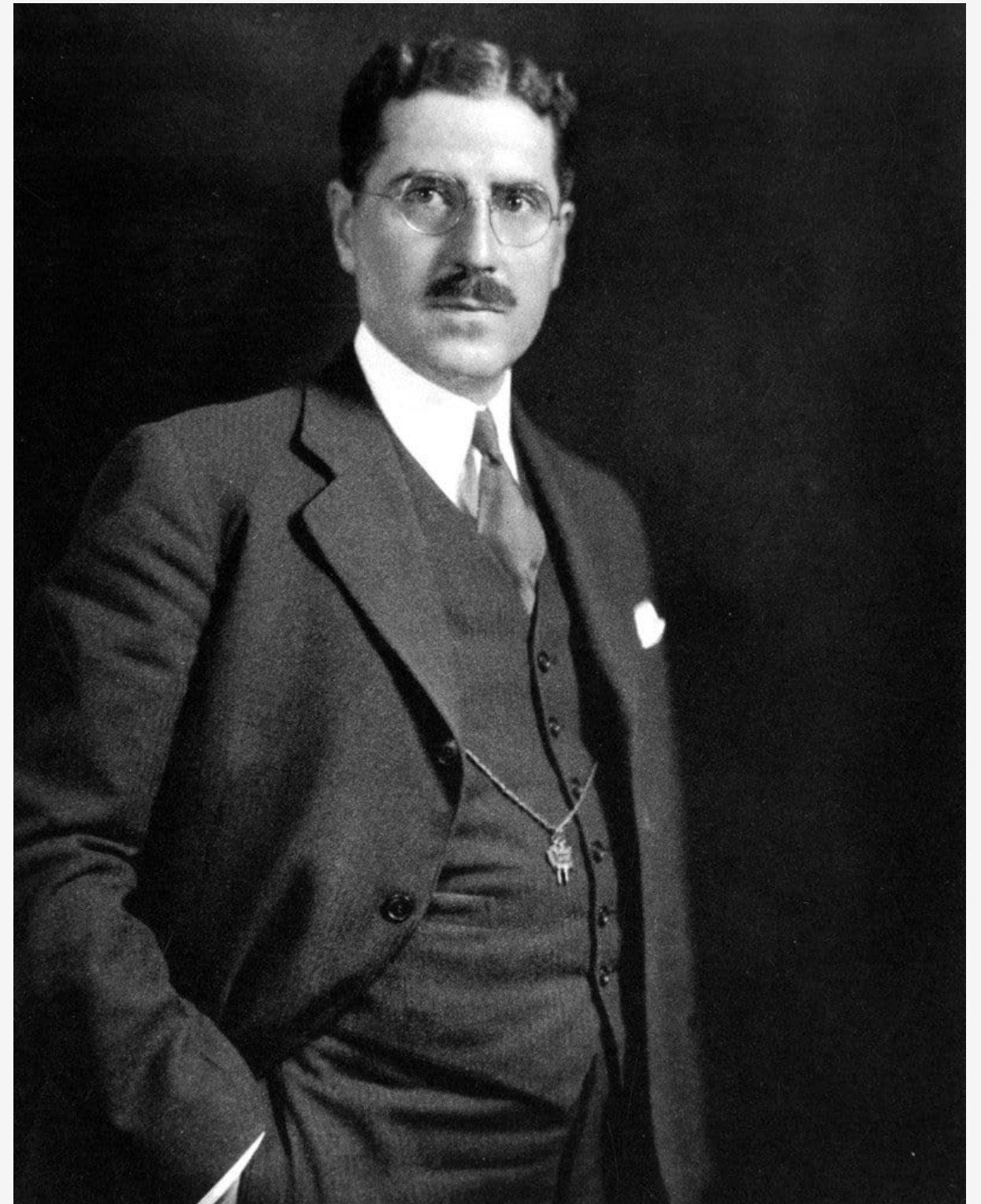
CT Imaging

- No evidence of dissection or aneurysm
- Left common carotid with reduced caliber and anterior wall flattening



Transient Perivascular Inflammation of the Carotid Artery (TIPIC) Syndrome

- Previously called “Carotidynia”
- Unilateral OR Bilateral cervical pain, tenderness over carotid, augmented pulse secondary to inflammation
- Consensus diagnostic criteria
- Relatively rare
- Self-Limited Condition





Summary

- Commonly encountered complaint
- Spectrum of etiologies from benign to life-threatening
- Consider arterial and venous systems
- Utility of multiple imaging modalities depending on clinical concern – US, CT, MR

References :



THE WARREN ALPERT
Medical School
BROWN UNIVERSITY

1. Abreu J, et al. Transient Perivascular Inflammation of the carotid artery (TIPIC) Syndrome: An atypical Cause of Neck Pain. *Cureus*. 2023 Jul; 15(7)
2. Lee V, et al. Incidence and outcome of cervical artery dissection: A population-based study. *Neurology*. 2006 67(10): 1809-1812
3. Arnold M, et al. Gender differences in spontaneous cervical artery dissection. *Neurology*. 2006; 67(6):1050-1052
4. Blum C, Yaghi S. Cervical Artery Dissection: A Review of the Epidemiology, Pathophysiology, Treatment, and Outcome. *Arch Neurosci*. 2015; 2(4)
5. Kohler R, et al. CT and MR Angiography Features of Traumatic Vascular Injuries of the Neck. *Neurorad/Head and Neck Imaging*. 2011. 196(6)
6. Rushton A, et al. International Framework for Examination of the Cervical Region for Potential of Vascular Pathologies of the Neck Prior to Musculoskeletal Intervention: International IFOMPT Cervical Framework. *J Ortho&Sports PT*. 2023 Jan 53(1): 7-22
7. Curtis, B, Fitchett, E. A vascular cause of neck pain. *Intern Emerg Med* 2017 (12)895-897
8. Patel J, et al. Vascular Trauma in the Head and Neck and Endovascular Neurointerventional Management. *J Clin Imaging Sci*. 2020; 10:44
9. Jaber TM et al. Lemierre's Syndrome: A Case Series. *Cureus*. 2021;13(10)
10. Karkos PD, et al. Lemierre's syndrome: A systematic review. *Laryngoscope*. 2009;119(8):1552-1559



Thank you!