What Do You Think of My Posterior?

Posterior Stroke and Stroke Mimics

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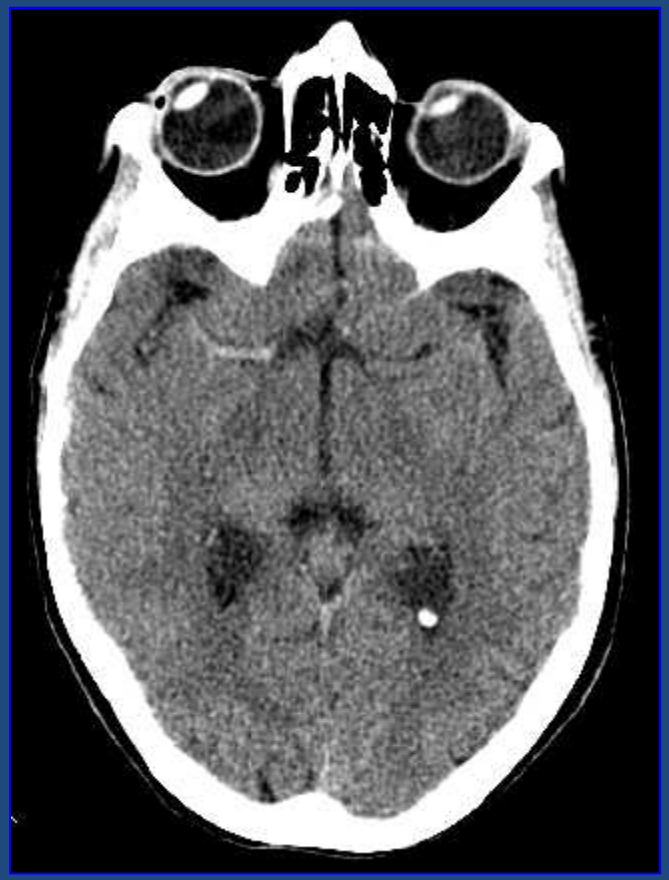
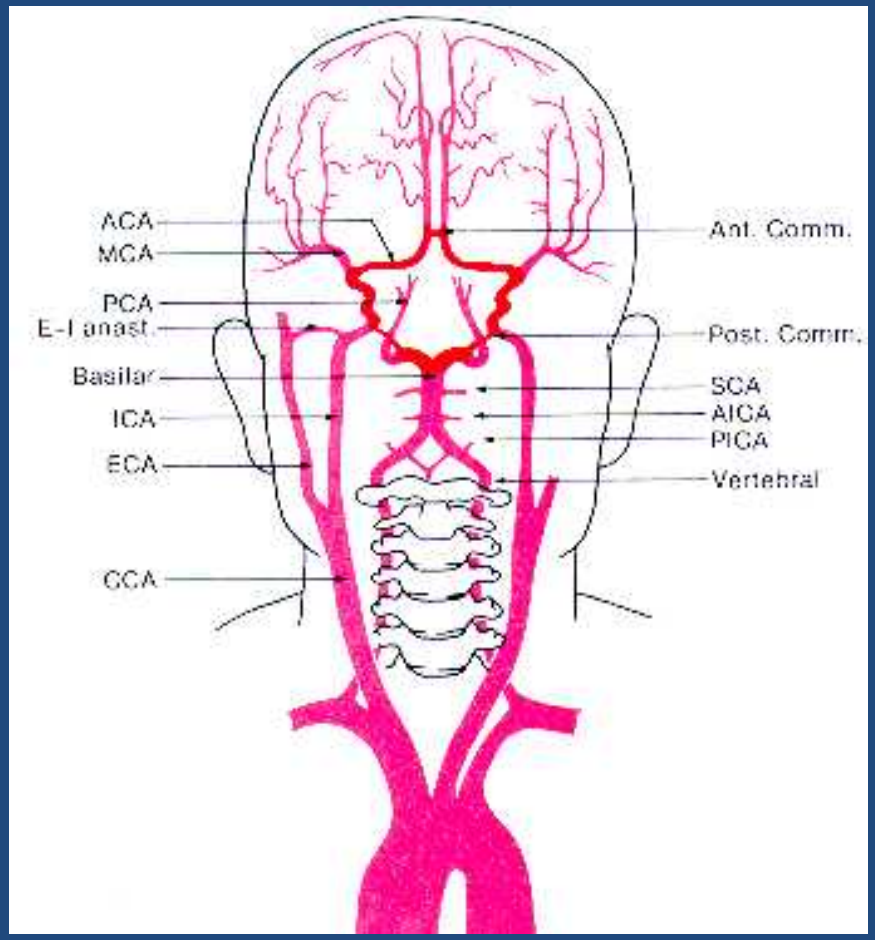
Burden of Cerebrovascular Disease

- 795,000 strokes/year US
- Approximately 15% of all strokes heralded by a TIA
- Of those who survive, 90% have a deficit
- 2010 Indirect and Direct cost: $36.5 billion
- 2012-2030 Cost will triple



Heart disease and stroke statistics—2014 update: A report from the American Heart Association. *Circulation.* 2014, Circulation ;129: e28-e292.

Anatomy of the Brain

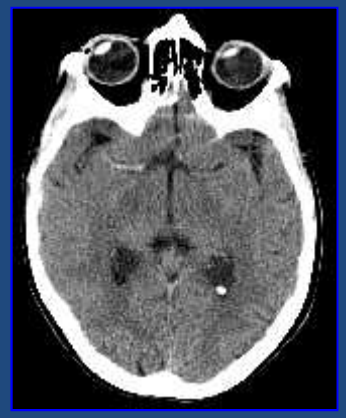


87% are Ischemic

- 80% are Anterior Circulation
- 20% Posterior Circulation

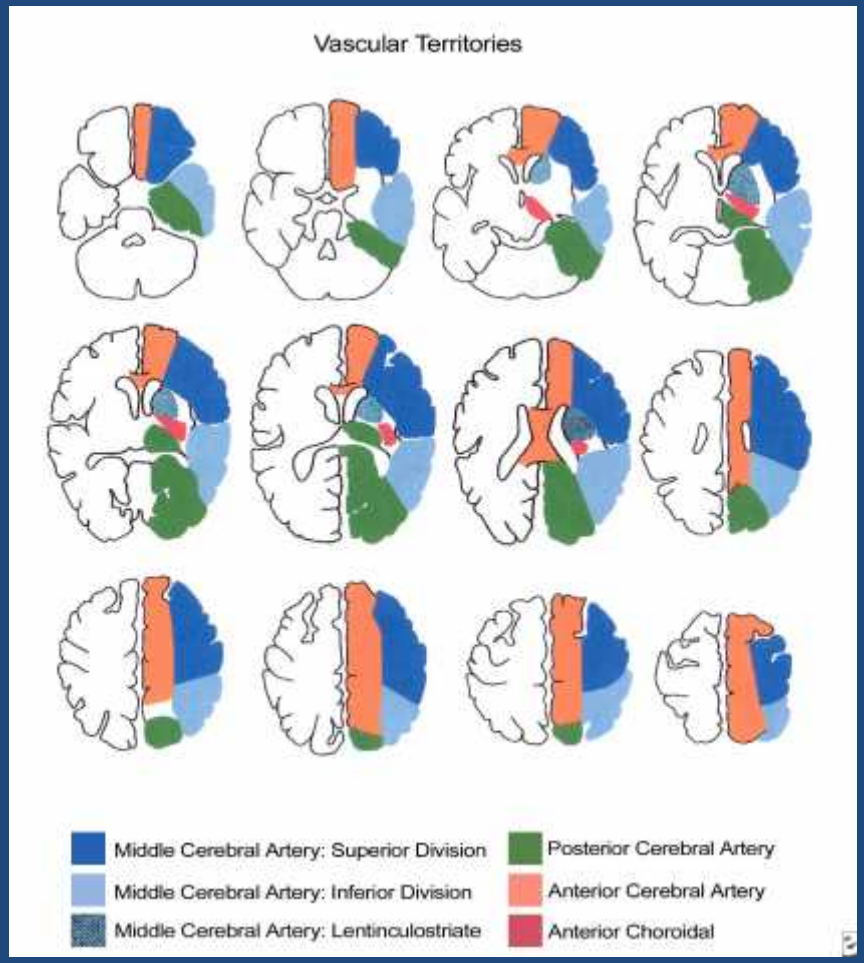
10% ICH

3% SAH



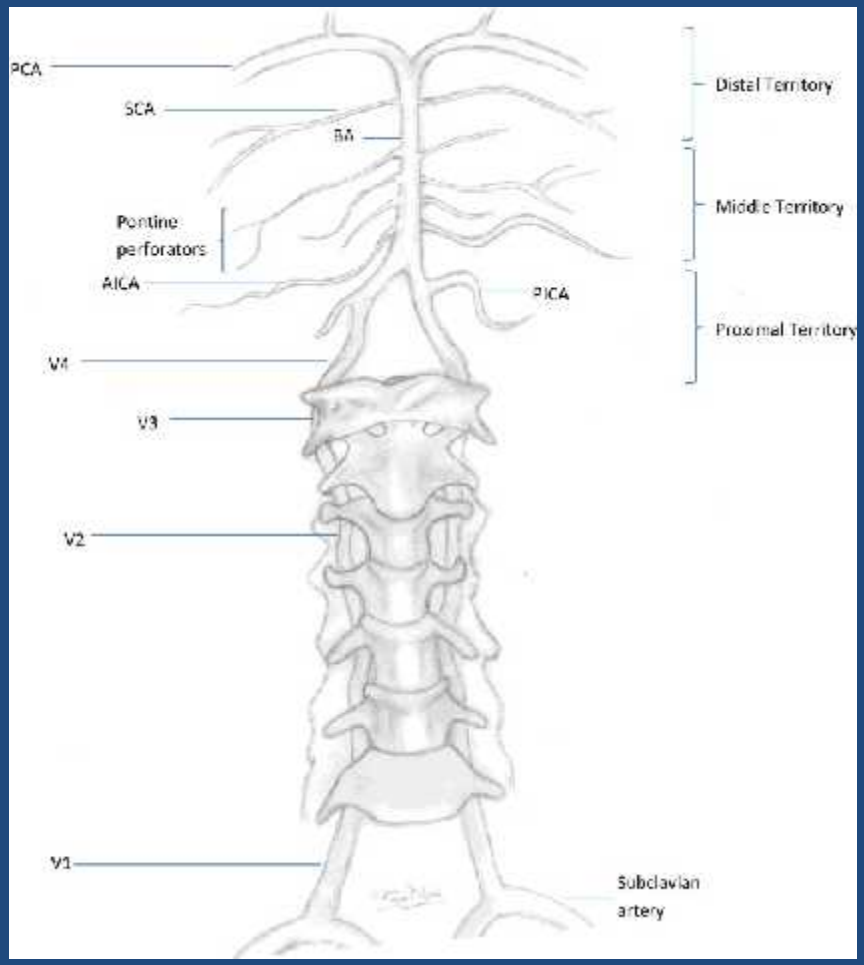
Heart disease and stroke statistics—2015 update: A report from the American Heart Association. *Circulation.* 2015, Circulation ;131: e1-e295.

Stroke Types: Anterior Circulation



- Time Course
  - Sudden or rapid
  - Max intensity < 24 hours
  - Gradual/stepwise 30%
- Focal
  - Difficulty with speech
  - Unilateral weakness
  - Unilateral numbness
  - Dysarthria
  - Neglect
  - Visual loss in 1 eye of VF
- Global
  - HA, AMS, Syncope, seizure, coma

Stroke Types: Posterior Circulation



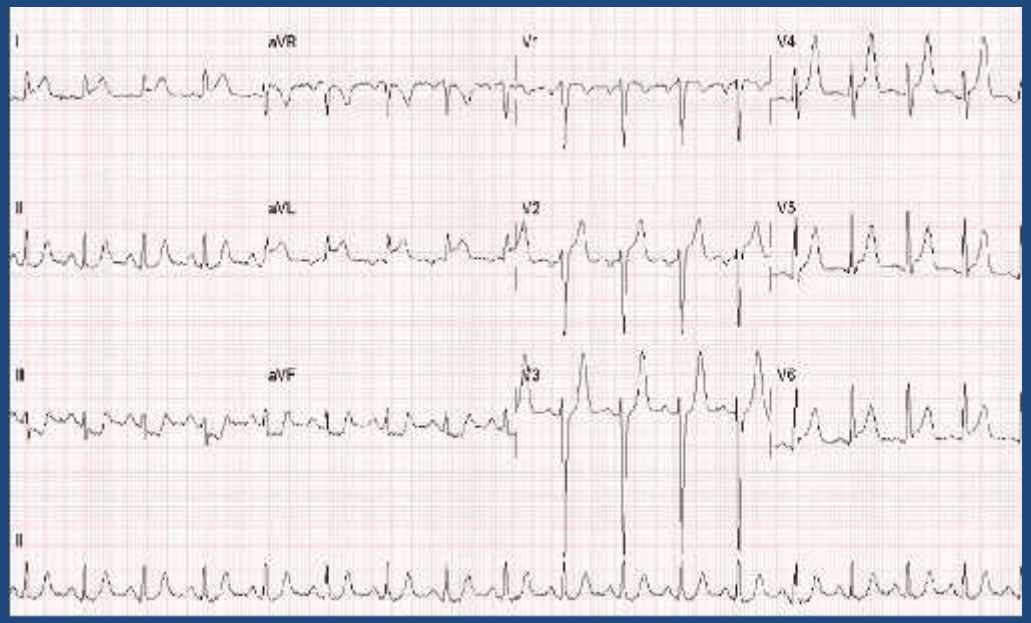
- Symptoms and Signs:
  - Dizziness/Vertigo: 47-75%
  - Dysarthria: 31-64%
  - N/V: 27-60%
  - LOC/AMS: 5-18%
  - Limb weakness: 38-49%
  - Ataxia: 31-65%
  - Nystagmus: 24-48%

Source: NEMC-PCR;IPCSQ

Differential Diagnosis: It's Hard Stuff

- Ischemic Stroke
- Hemorrhagic Stroke
- Trauma
- Meningitis/Encephalitis
- Mass
  - Tumor
  - Subdural hematoma
- Seizure: post-ictal
- Conversion Disorder
- Complicated Migraine
- Metabolic
  - Hyperglycemia
  - Hypoglycemia
  - Post-cardiac arrest
  - Drug overdose

Easier for STEMI and Trauma



It Really Is Not That Hard

Mimics are Common

19% of patients diagnosed with AIS by Neurologists before CT scanning actually had a non-cerebrovascular cause for their symptoms!

Most Frequent Stroke Mimics Include:

Seizure – 17%

Systemic Infection – 17%

Brain Tumor – 15%

Toxic/Metabolic – 13%

Positional Vertigo – 6%

Conversion Disorder

CASES

Case 1: Church is Dangerous

CC: Weakness/dizziness while at church

HPI: 82 y/o male Parkinson's with DBS on ASA/Plavix from church with acute dizziness and weakness. Difficulty walking. Vomiting in ambulance

Initial Exam:

MS: Sleepy but arousable

Language: No aphasia

CN: EOMI, R gaze pref

Motor: 4+/5 all extremities

Sensation: Intact

Coordination: RUE ataxia

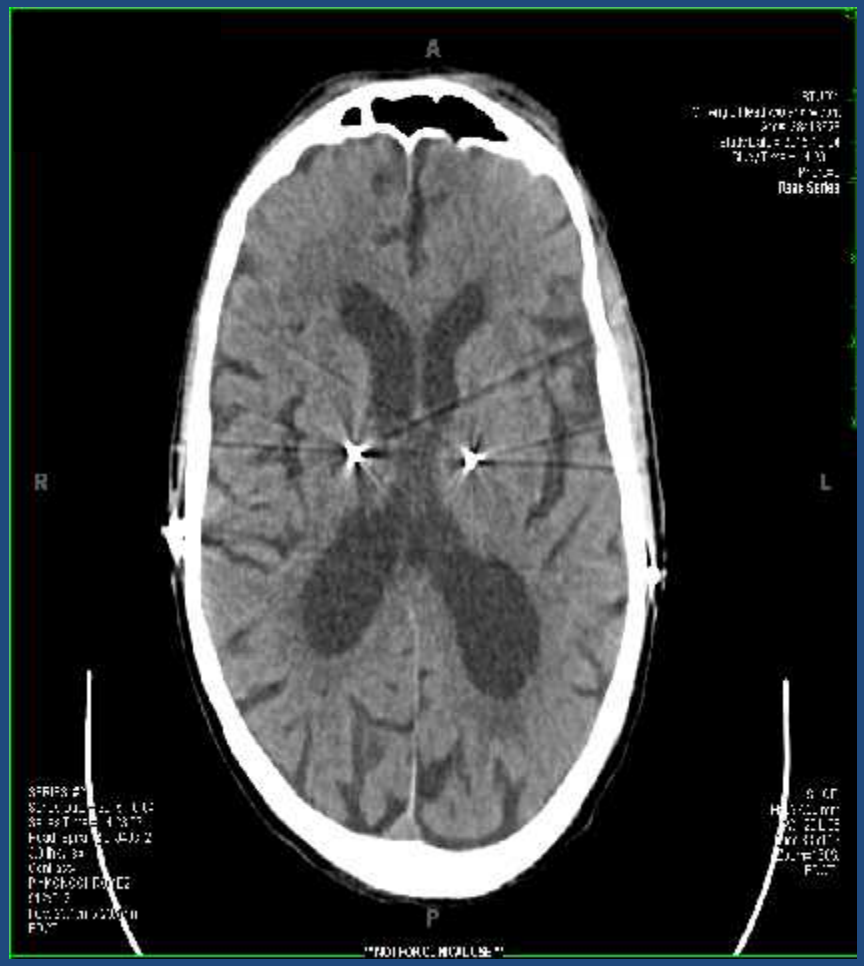
Reflexes: 2+ all extremities

NIHSS: 4

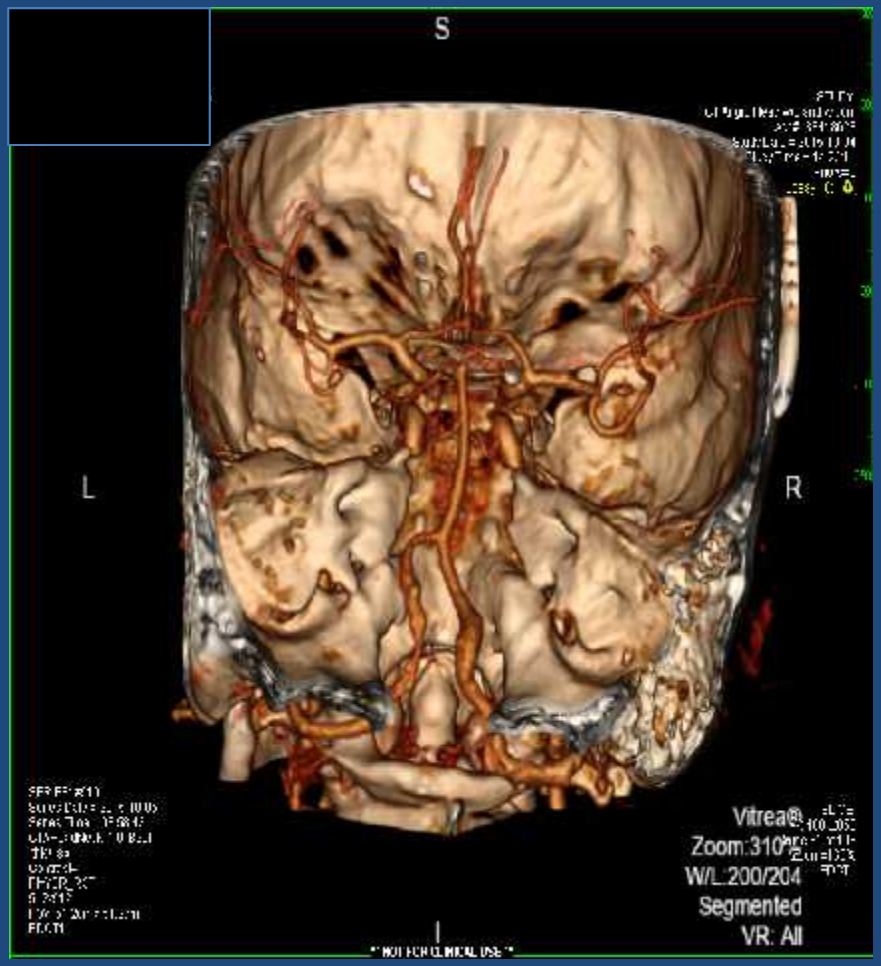
Case 1

- **ED Course**
  - EMS did not activate stroke team (Delay #1)
  - Placed in normal ED room (Delay #2)
  - IV Diazepam & Zofran ➡ Reassess (Delay #3)
  - Exam: rotary nystagmus
  - Stroke Team Activated
  - Imaging ordered

Case 1



Non-contrast CT Head

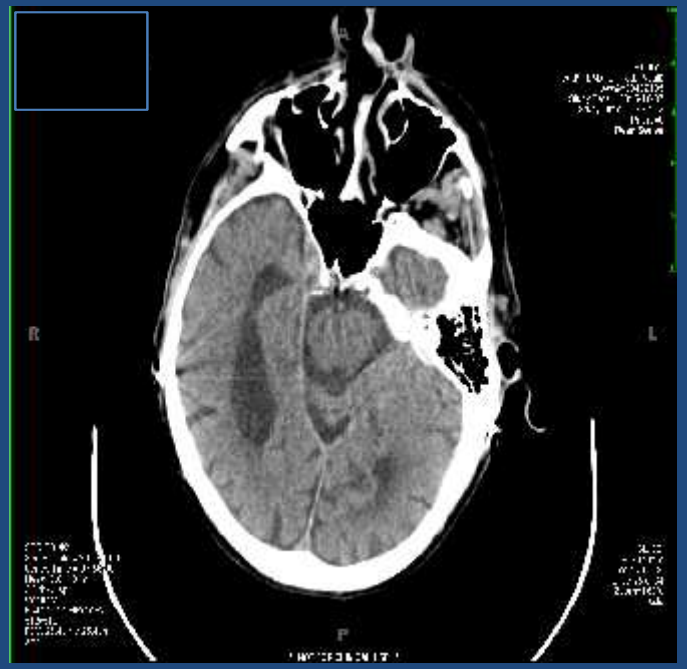


CT Angiogram of the Head and Neck

Case 1

Hospital Course

- Due to advanced age and outside extended time window patient determined not a tPA candidate
- Acute CTA no evidence of large clot (no intervention)
- Admitted to Neurology
- MRI unable to be obtained due to DBS
- Discharge Diagnosis:
  - Acute right pontomedullary stroke
  - CT scan unchanged
  - New onset atrial fibrillation
  - Home with home health services



Dizzy^{+} Rule in Effect

Case 2: Read Everything

- 47 year old female
- Generally Healthy
- Presents to Emergency Department
- EMS Note: "Dizzy and nausea"
- Nursing Triage Note:
- **CC:** "Dizzy, nauseated, weak on Right"

CASE 2

- Nursing Triage Continued:
- **HPI** – “This afternoon at work began with above signs and symptoms, still dizzy, c/o nausea, weakness getting better”

- **PMH** - Migraines

Case 2

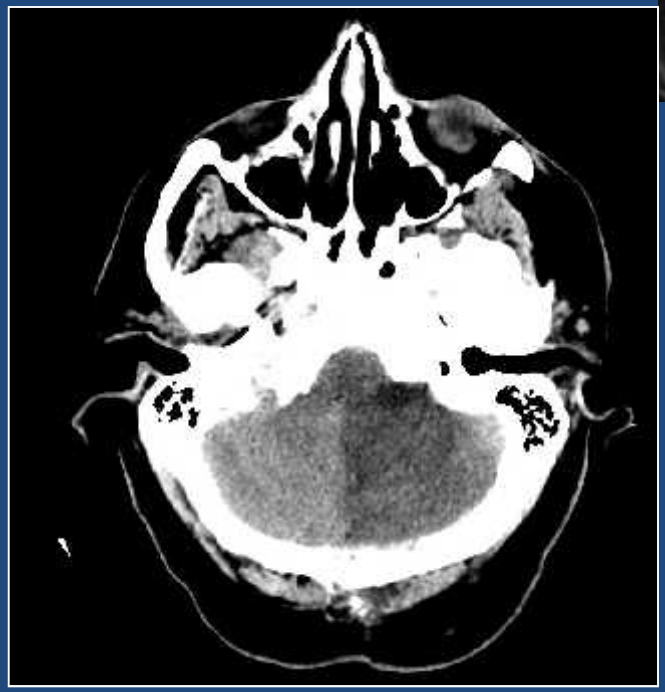
- **MD Note:**
  - Patient Says – “I’m weak and dizzy”
  - Weakness not questioned further
  - Nursing note – “never saw it” (In deposition)
  - “Non-focal” on exam
  - Patient “feeling better” so will discharge

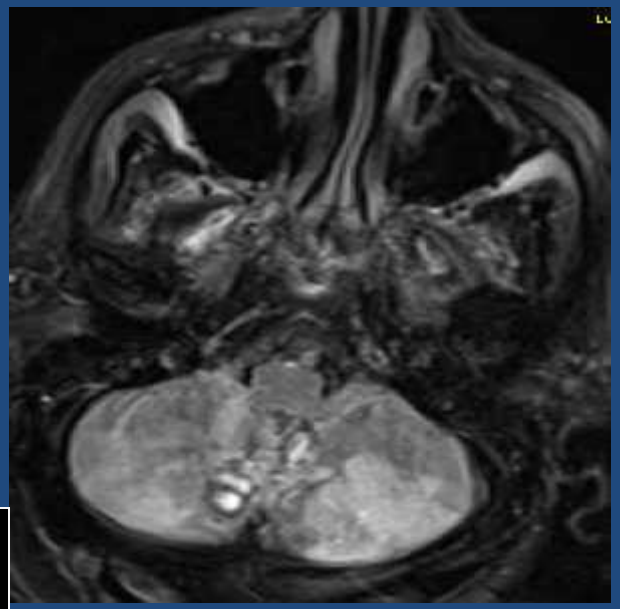
CASE 2

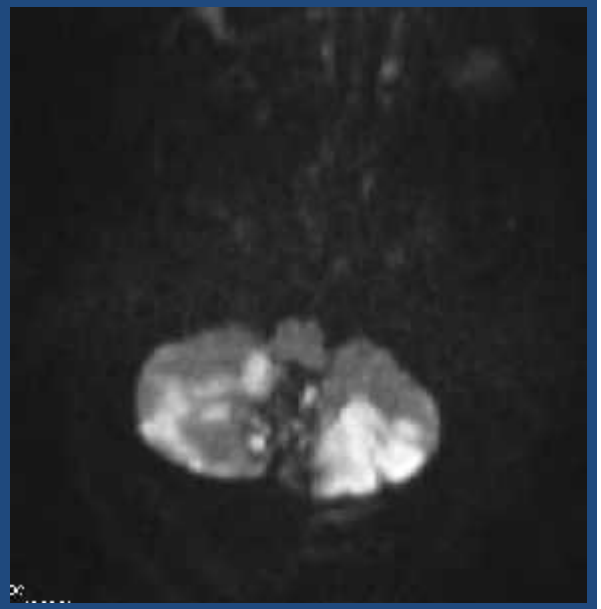
- **Case Follow-up:**
  - Patient goes Home, Gets “worse”, Gets “Weaker”
  - Goes to the “other” hospital
- That ED Physician orders a CT and MRI…

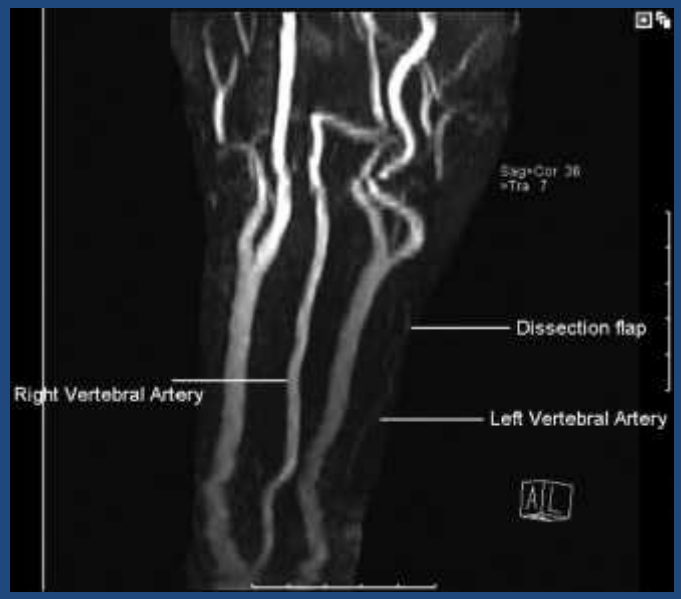
CASE 2

Dizzy+ Rule in Effect









Diagnosis: Vertebral Dissection and Cerebellar Stroke

Case 3: My Head Hurts Too

CC:

High blood pressure

HPI:

52 y/o female with h/o HTN and migraines presents to ED for high blood pressure, headache with vomiting and photophobia.

Exam:

MS: Normal

Language: No aphasia

CN: Normal upon arrival

Motor: 5/5 all extremities

Sensation: Intact

Coordination: Normal

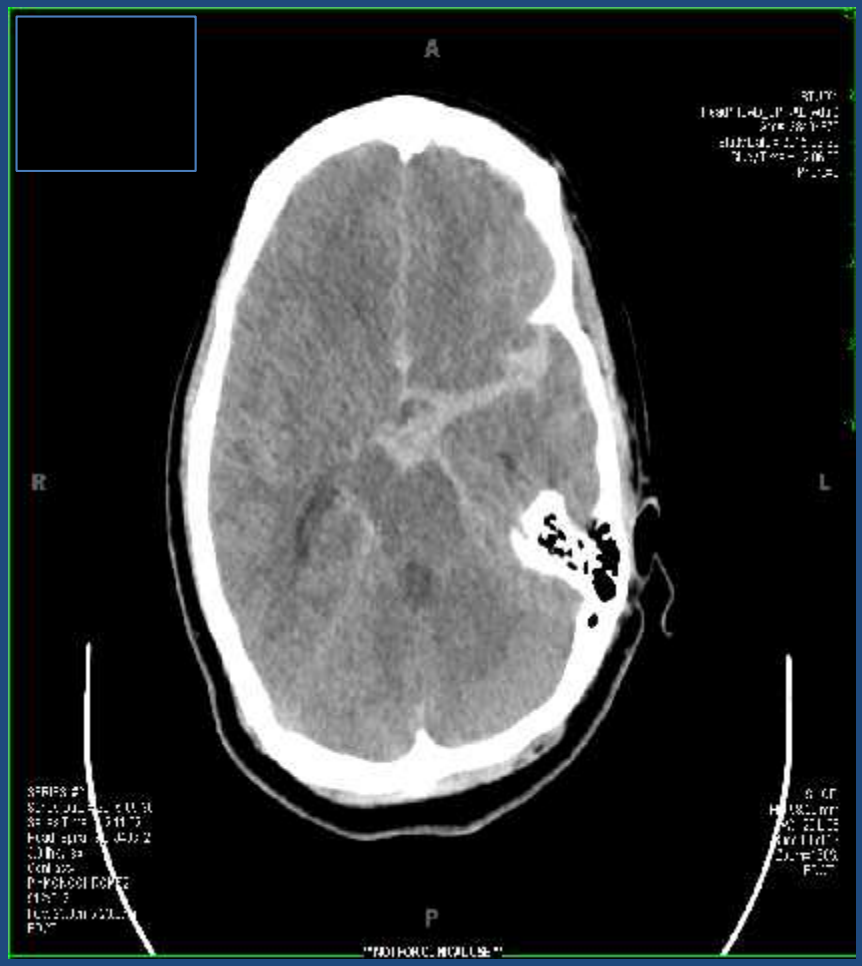
Reflexes: 2+ all extremities

NIHSS: 0

Case 3:

ED Course

- Upon returning from CT scan went unresponsive
- Intubated
- IV anti-hypertensives
- IV anti-epileptics
- Neurosurgery consulted
- Admitted to NICU
- Expired HD # 4



Case 4: Ain't What It Seemed

CC:

Right-sided numbness and clenched fists

HPI:

32 y/o female with h/o pseudoseizure, migraine HA, HTN, Ulcerative colitis s/p colostomy, hypothyroidism LKW 14:45 flown from scene to ED

Exam: NIHSS = 3

Gen—Mild distress

MS – A&O x 4, speech nl

CN – normal

Motor – 5/5 UE/LE

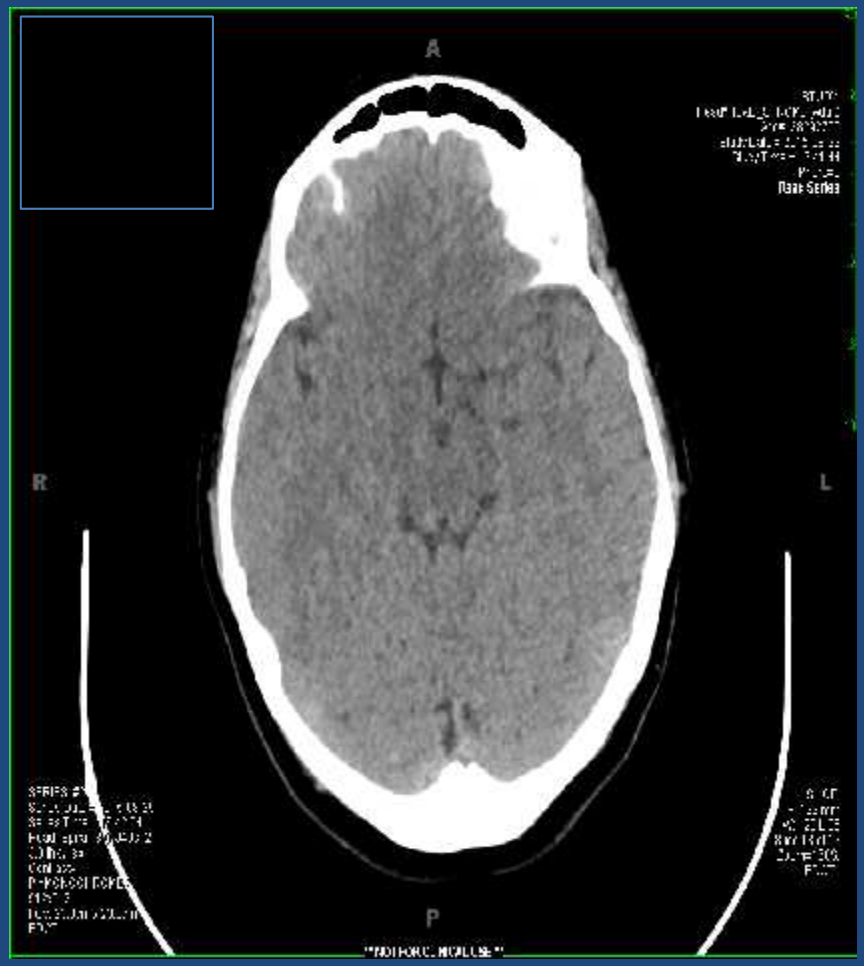
Sensory – diminished right face/arm/leg

Coordination – no ataxia

Gait – normal

DTR's – 2+ normal

Case 4



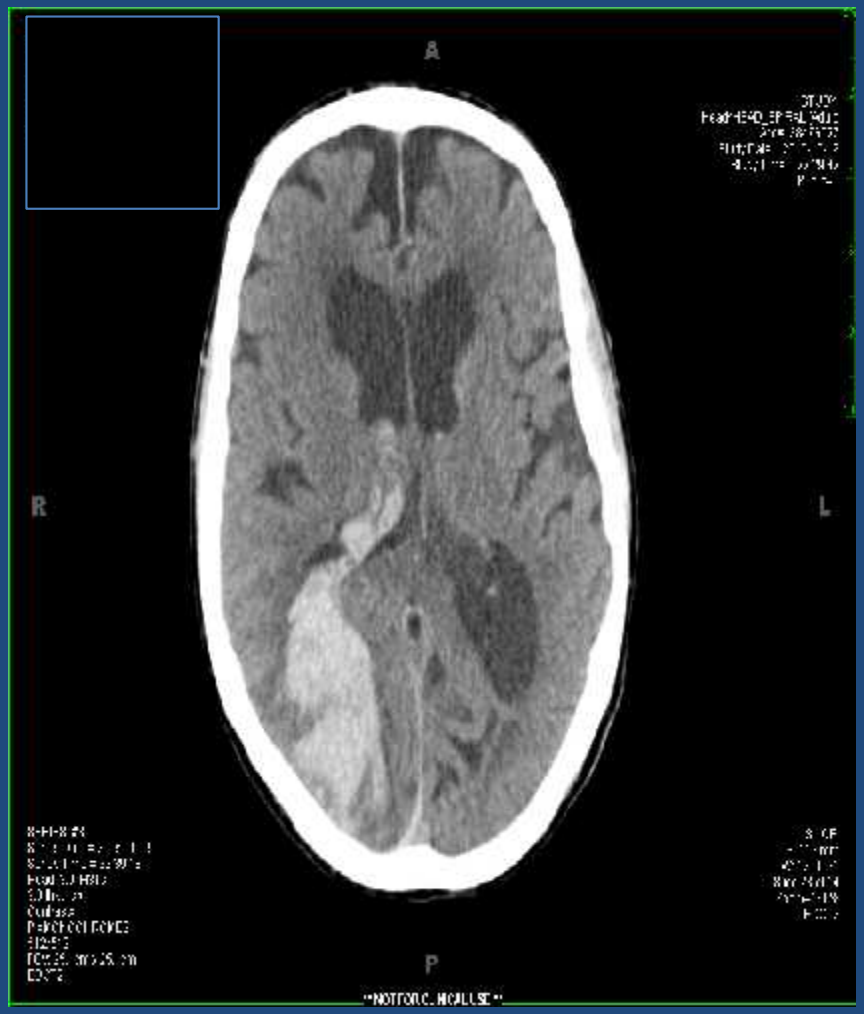
Non-Contrast CT Head

ED Course:

- Stroke Activation
- Exam inconsistent
- Admits to considerable life stressors
- Diagnosis: Conversion Disorder
- Disposition: Home

Case 5: I See It Differently

- CC: Eye vision change
- HPI: 84 year-old male woke up this am with vision loss right eye, now worse in both eyes. Mild frontal headache.
- PMH:
  - HTN
  - Hypothyroidism



Non-Contrast CT Head

Remember
Stroke is Difficult

Common Themes in Stroke Evaluation

- Failure to consider stroke in atypical presentations
- Failure to consider stroke in general
- Failure to recognize posterior circulation stroke
  - Dizzy, vomiting, weakness, vertigo, numbness, blurred vision, headache, ataxia, altered mental status
  - IF **DIZZY PLUS** any other **FOCAL** symptom, think stroke
- Failure to activate stroke team
  - Being wrong is OK, really!
  - Go with your gut!

Thank You!