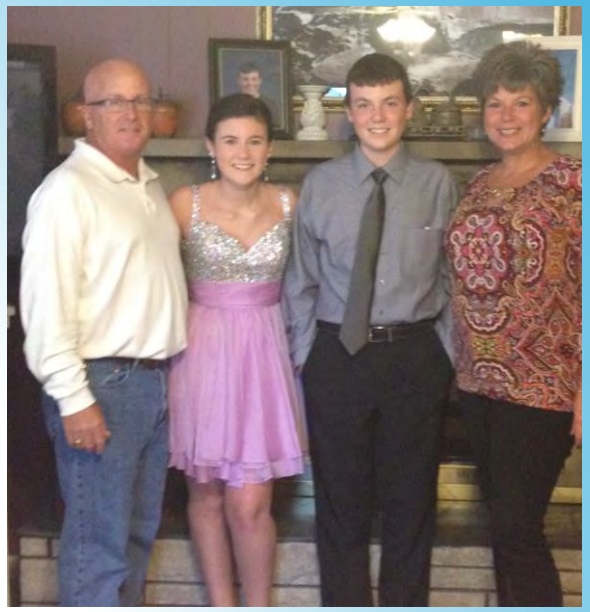
Marla’s Stroke Journey

Marla McCarthy

Marla



- Pertinent medical history – high cholesterol, smoking, overweight
- Started feeling off a few months prior – headaches, no history of migraines, started taking Excedrin Migraine daily
- PCP dismissed symptoms as related to a panic attack

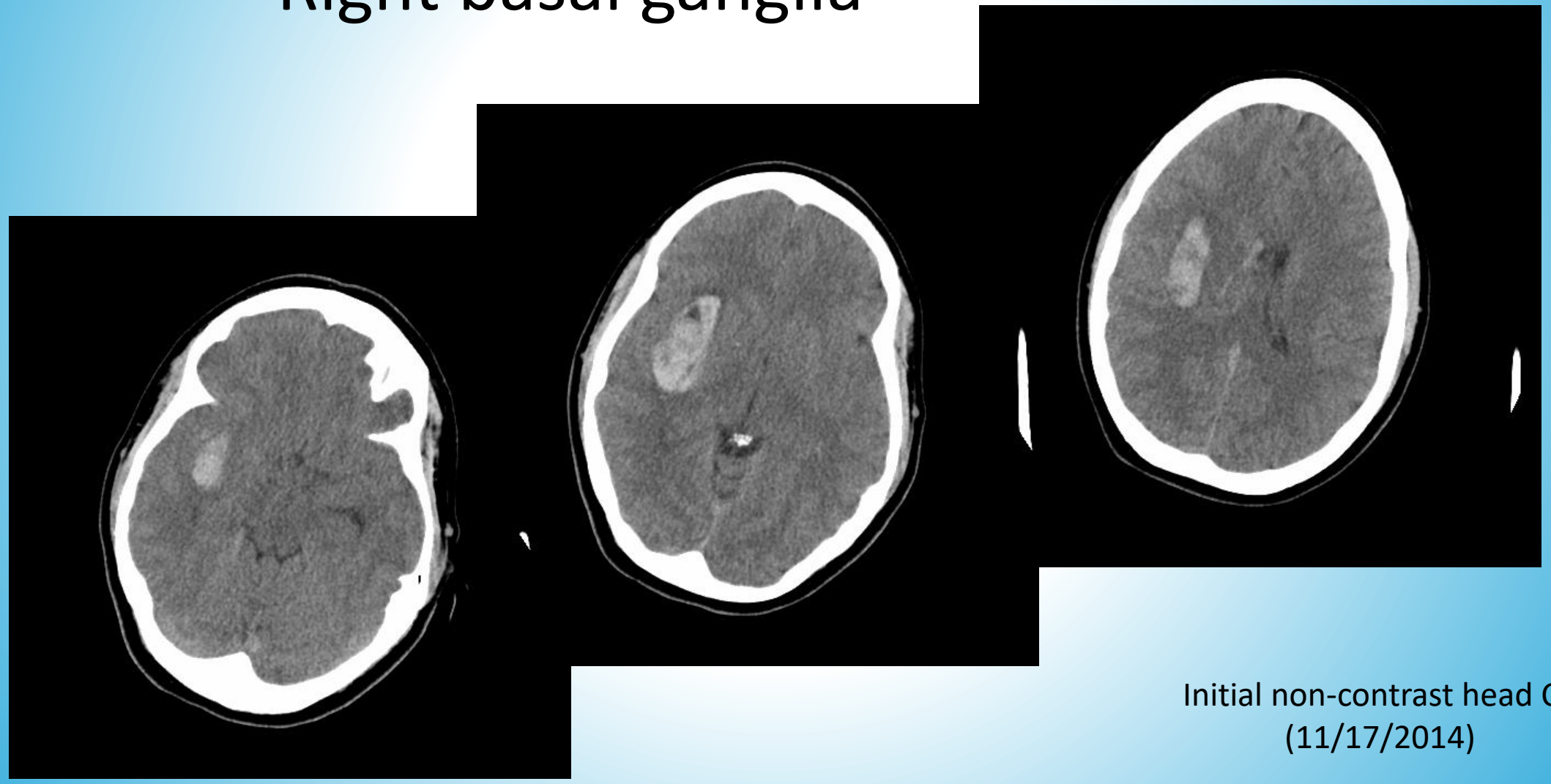
Marla

- Was working in an executive position, “Large and in Charge” at home and at work!
- November 2014 went to work for a typical day, went outside with a co-worker for a smoke break
- Started developing slurred speech, imbalance, and left facial droop. Co-worker called 911

Initial Evaluation

- 9-1-1 dispatch for stroke → paramedics or EMTs arrive at scene
- Screening, destination decision-making, pre-arrival notification
- Emergency department arrival → direct to CT
- Emergency Medicine evaluation and treatment
- Stroke Team,
  Neurosurgery /
  Neurointerventional, &
  Neurocritical care
  Consults

Marla's Intracerebral Hemorrhage (ICH)
Right basal ganglia



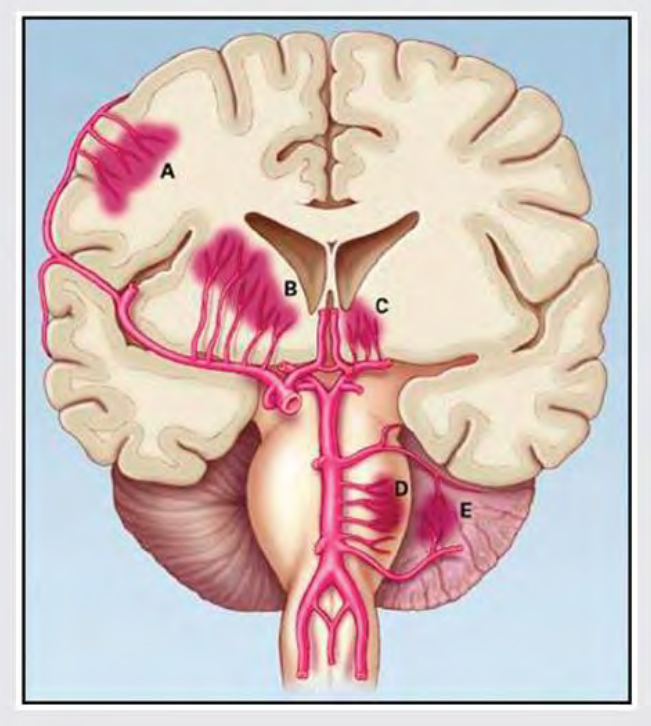
Initial non-contrast head CT
(11/17/2014)

Differential Diagnosis of Intracerebral Hemorrhage

Deep Locations (B, C, D, E)

(Basal Ganglia, Thalamus, Pons / Midbrain, Cerebellum)

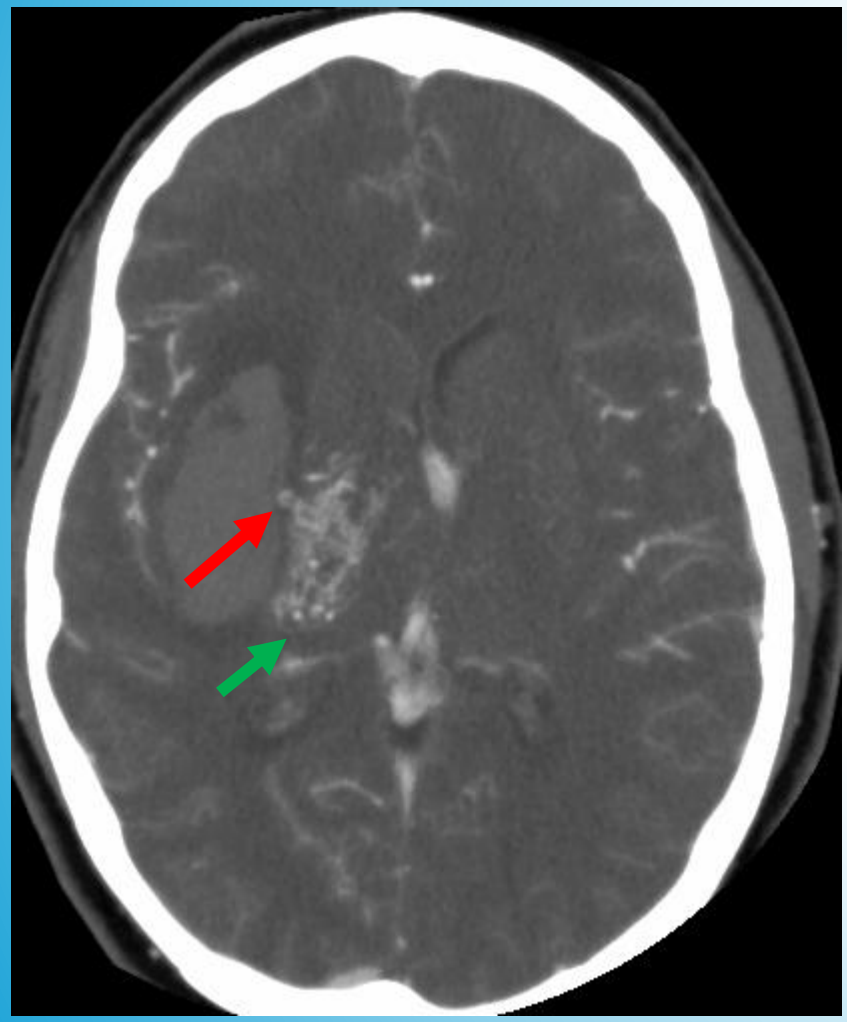
- Cause is typically poorly treated HTN

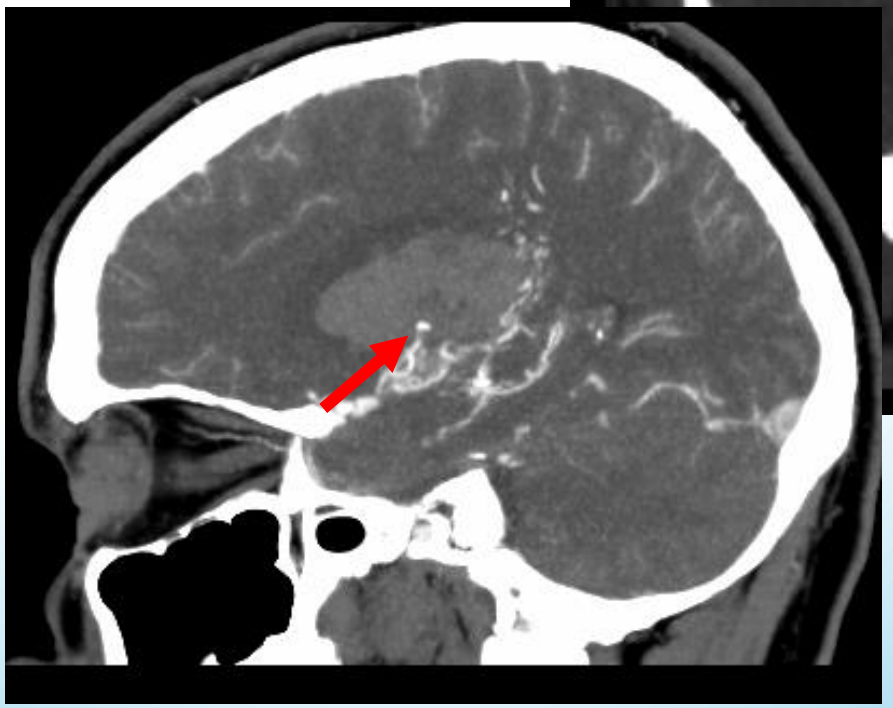


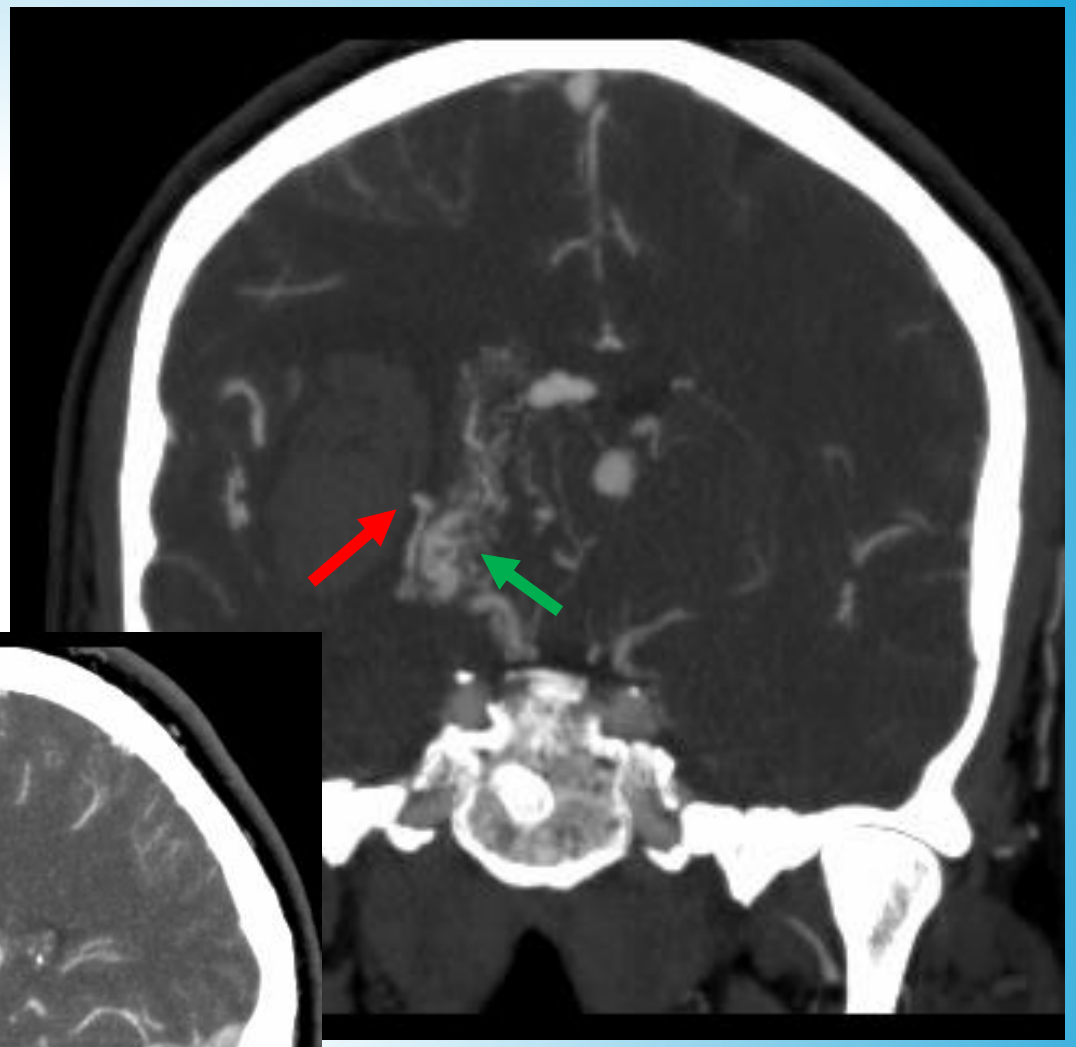
Superficial / Lobar Locations (A)

- Arteriovenous Malformation (AVM)
- Cerebral Amyloid Angiopathy
- Ruptured Mycotic Aneurysm (IVDU)
- Metastatic Cancer (melanoma, renal cell carcinoma, others)
- Cortical Vein / Dural Venous Sinus Thrombosis
- Hemorrhagic Transformation of ischemic stroke

Hypervascularity Suspicious for Arteriovenous Malformation (AVM)







CT Angiogram of the Head

When is a CTA not enough?

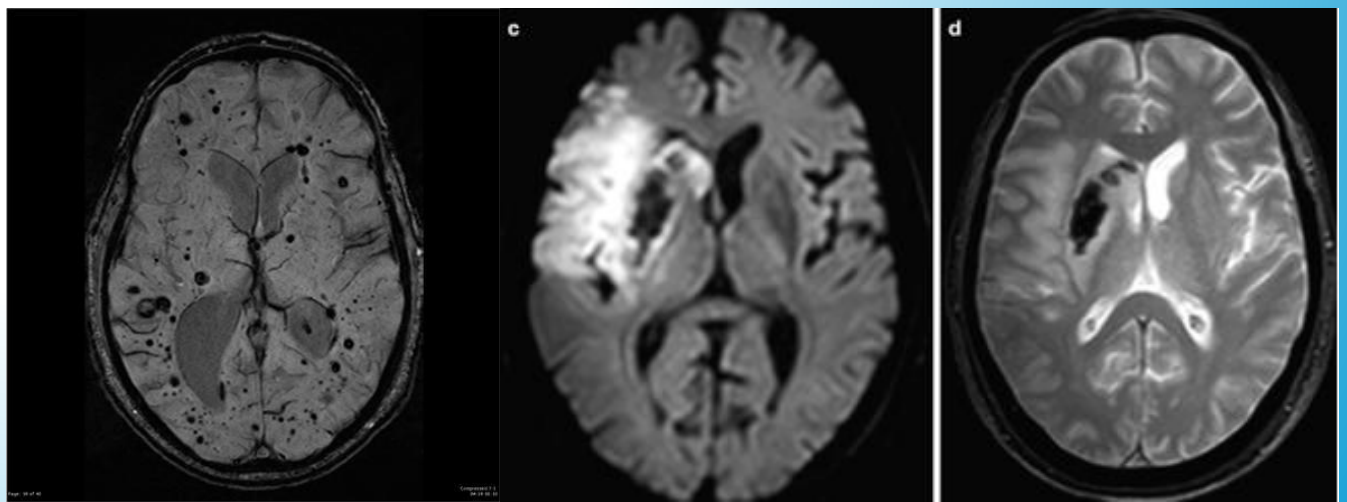
(When should we request a cerebral angiogram?)

Deep Locations

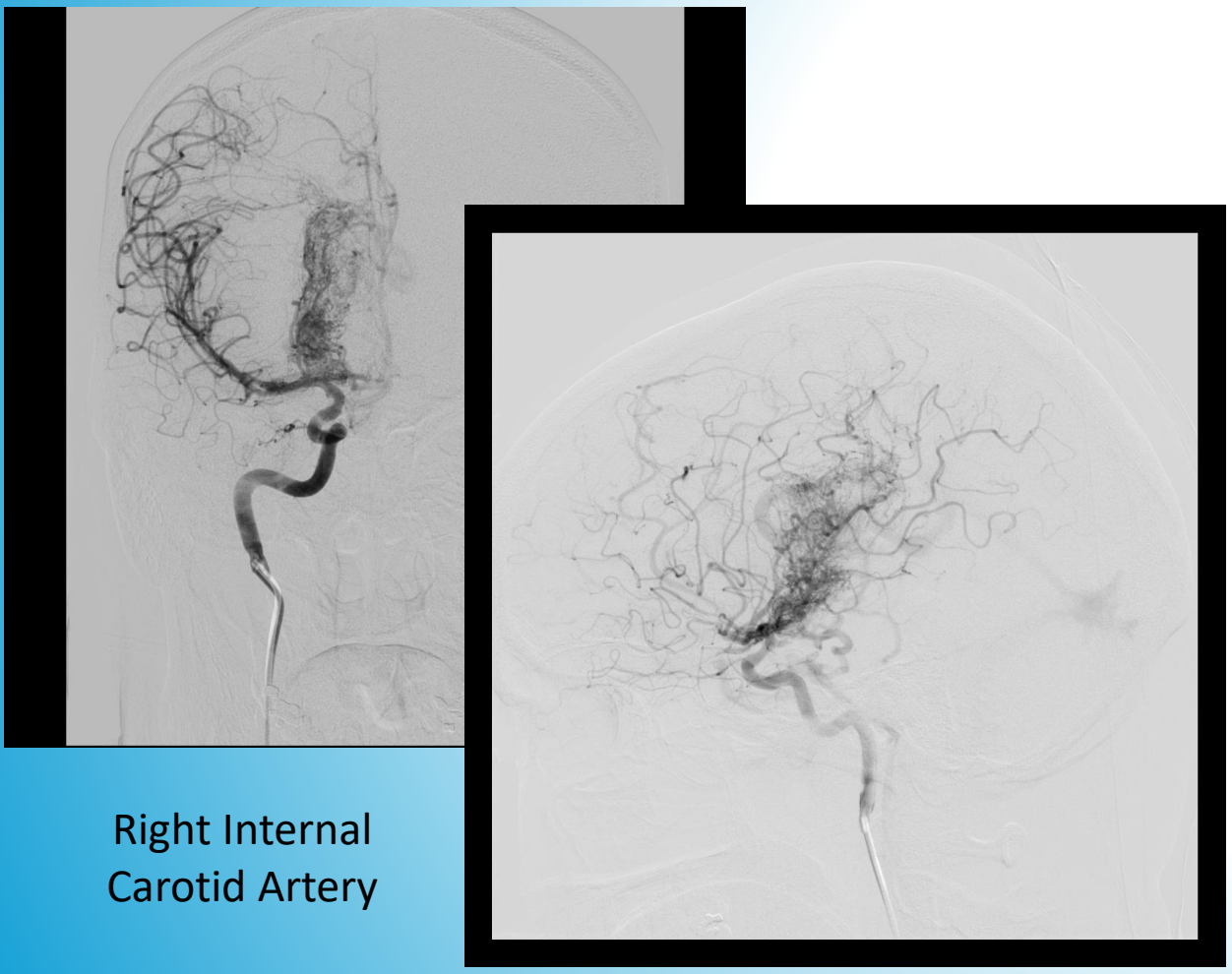
- No history of HTN
  - Pts with fresh intracranial blood are typically hypertensive in ED
  - Must dig deeper into pt's history…
- Any suspicious hypervascularity (?AVM)

Superficial / Lobar Locations

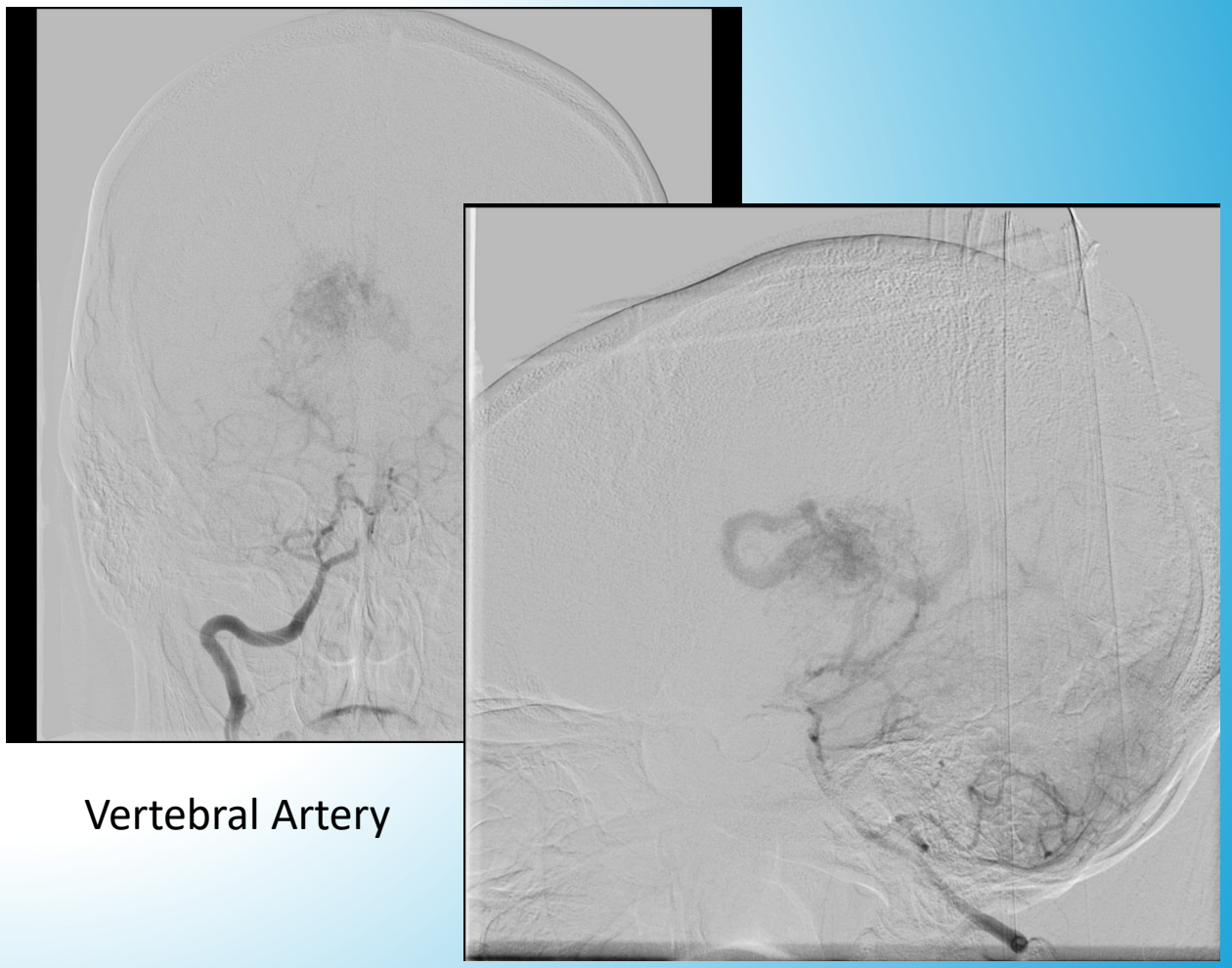
- Virtually every time!
- Exceptions:
  - MRI shows cerebral amyloid angiopathy or hemorrhagic transformation of acute ischemia



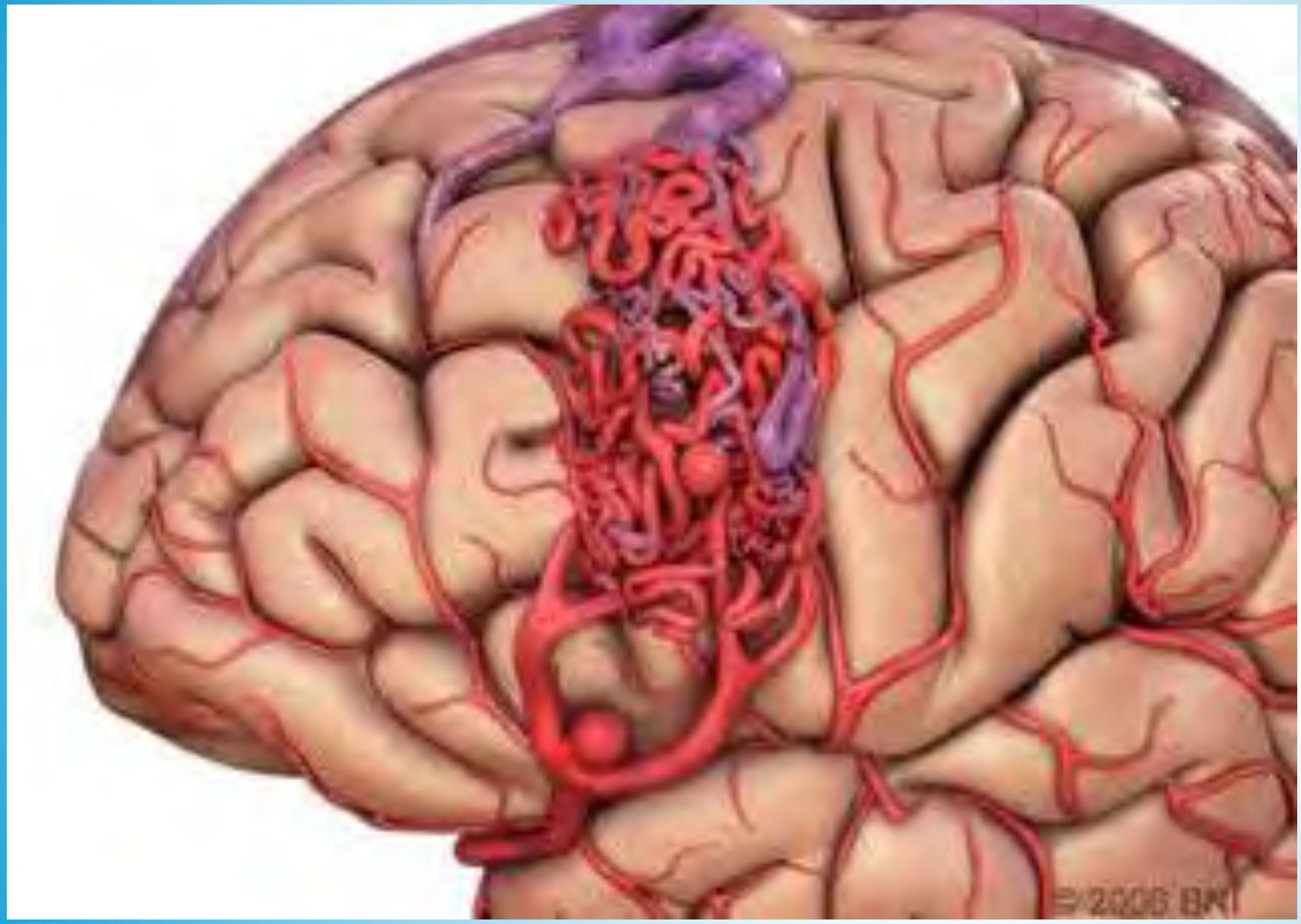
Cerebral Angiogram: Right thalamic AVM



Right Internal Carotid Artery

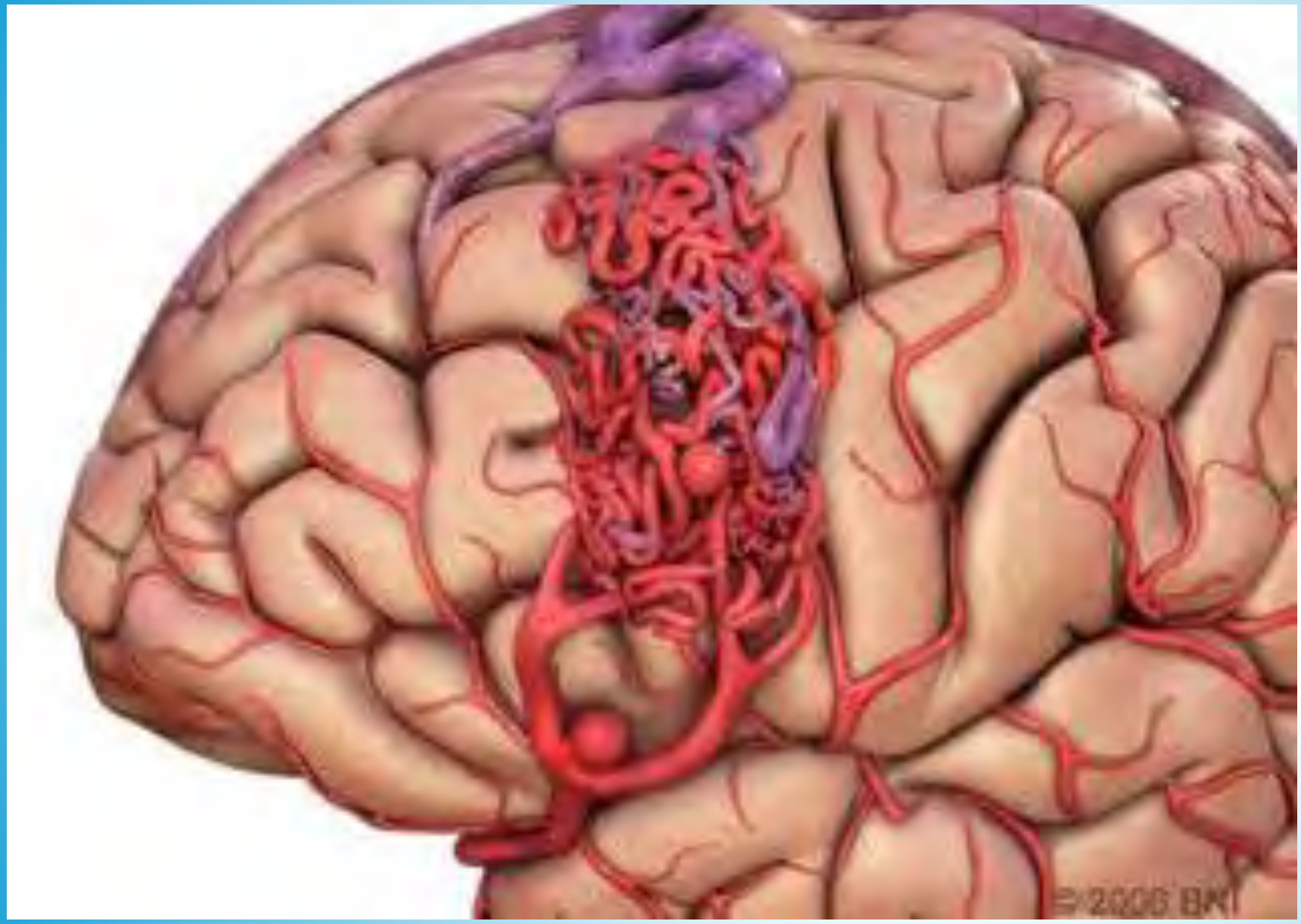


Vertebral Artery



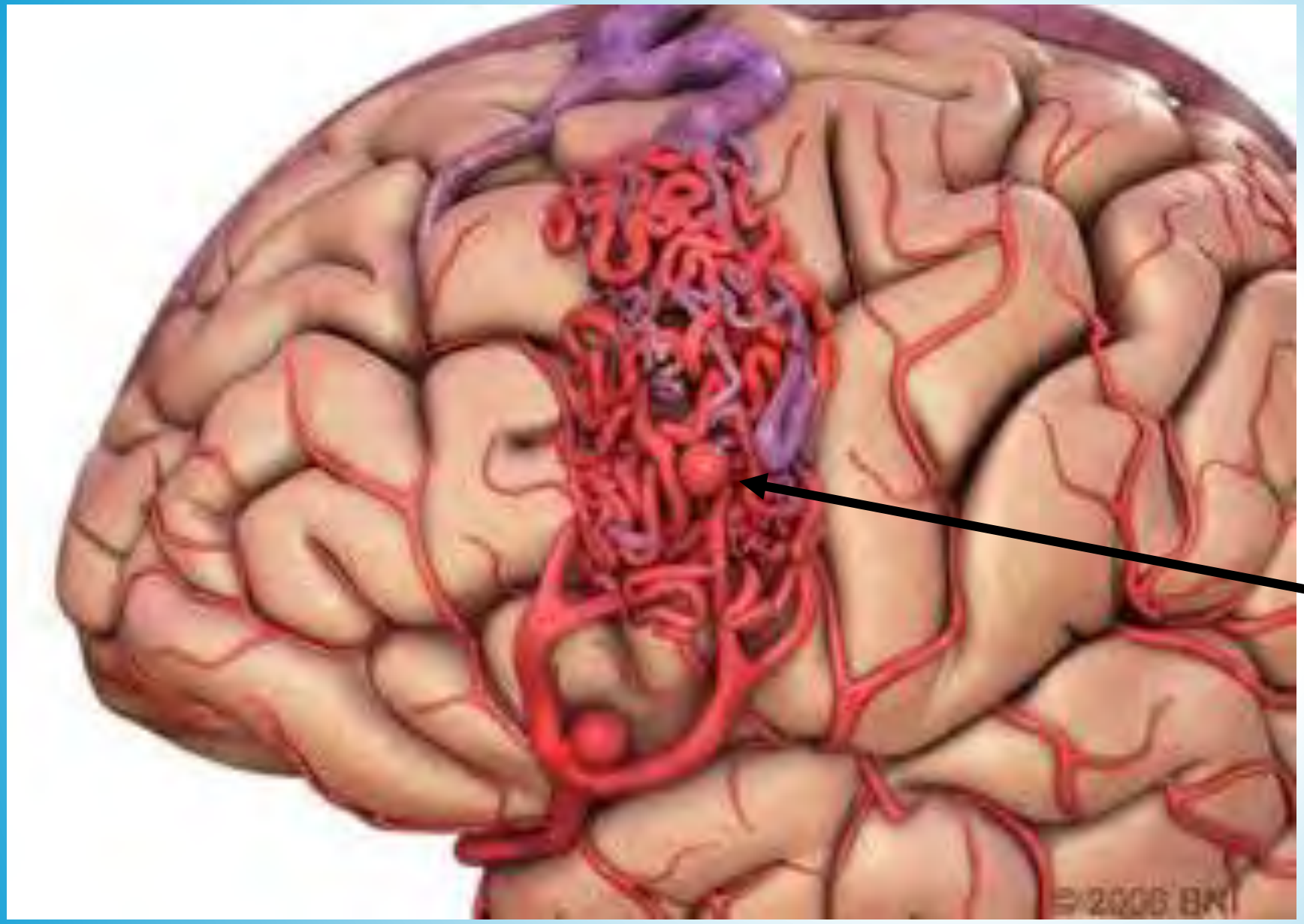
What is an AVM?

- Abnormal Connection between arteries and veins “like a bowl of spaghetti”
- High flow / Pressure
- Congenital lesions



Why do AVMs bleed?

Disruption in balance between high pressure arterial inflow & drainage through veins that were never designed to handle this much pressure



Why do AVMs bleed?

- Rupture at site of angio-architectural weakness

Peri-nidal aneurysm

Venous outflow constriction

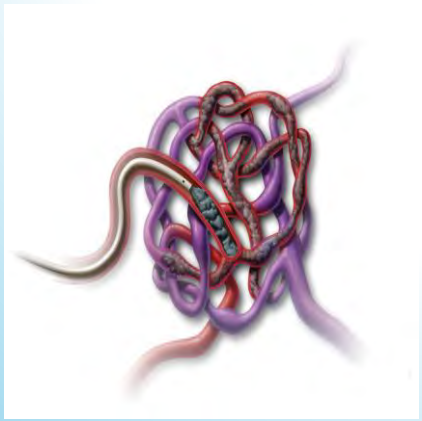
Flow-related aneurysm

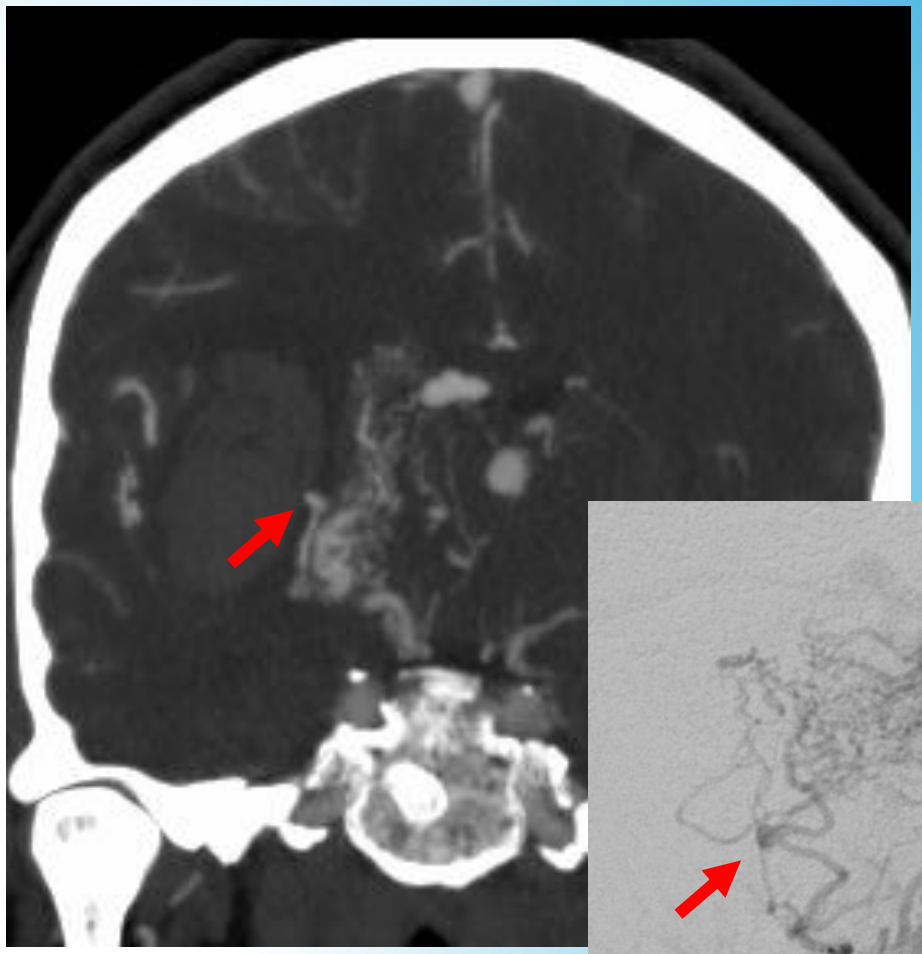
Early management of AVM

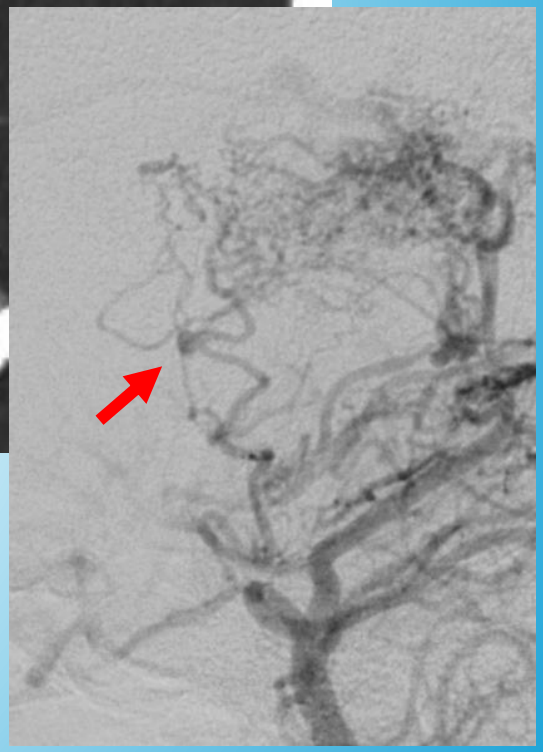
- Similar to any other cause of intracerebral hemorrhage
  - We'll talk more about nursing considerations
- Cerebral angiography

Goal of initial angiogram

- Understand inflows and outflows
- Help prepare surgeon for resection
- Identify areas of angio-architectural weakness
- Assess risk of embolizing these with n-BCA / Onyx



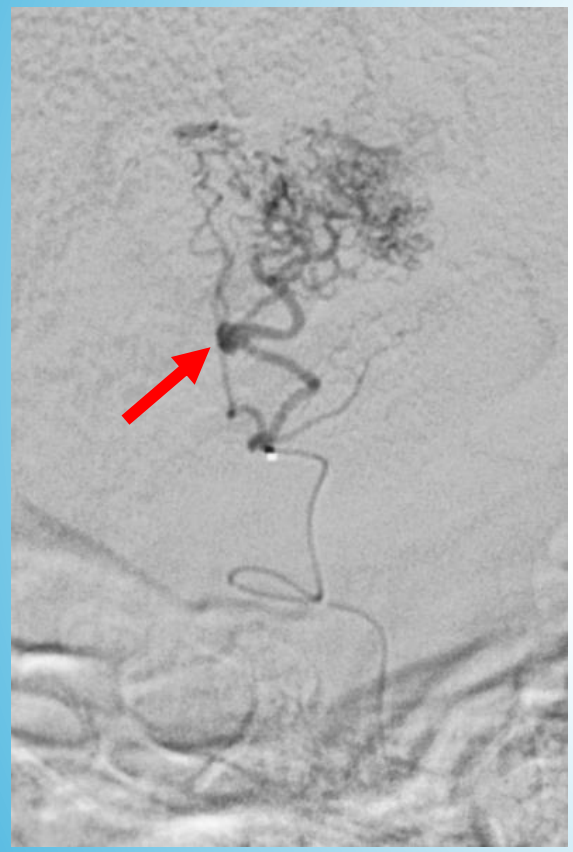




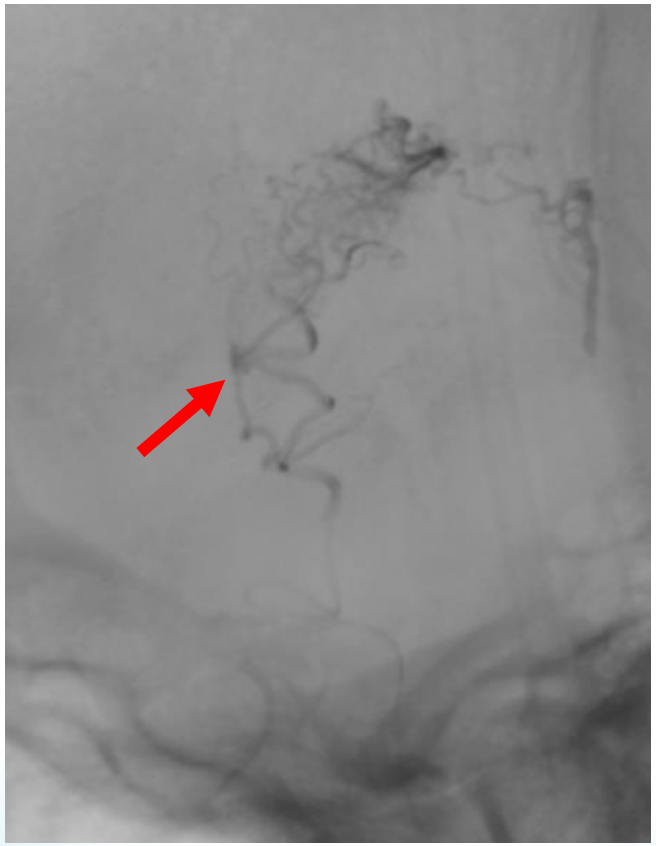
Early management of AVM

- Similar to any other cause of intracerebral hemorrhage
  - We'll talk more about nursing considerations
- Cerebral angiography
- Stop and plan it out carefully.
  - Daily Risk of AVM re-rupture is lower than subarachnoid hemorrhage from ruptured saccular aneurysm in Circle of Willis
  - Treat the presumed cause of AVM rupture (perinidal aneurysm)
  - Then wait for surgical resection, if surgery is deemed safe
  - Waiting allows for blood to reabsorb a bit, then surgeons can use hematoma cavity as pathway to AVM / help define its margins

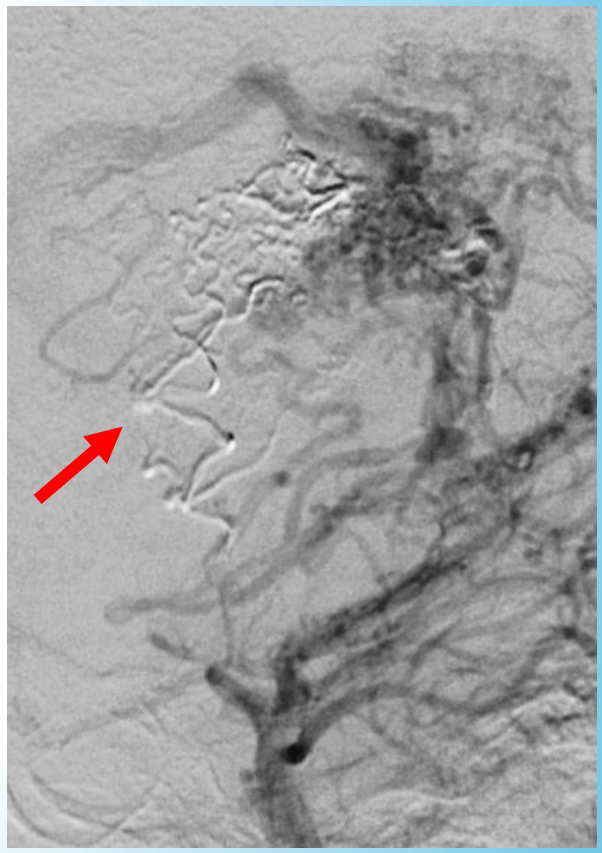
Embolization of peri-nidal aneurysm



Microcatheter in artery feeding peri-nidal aneurysm



Glue / Onyx Cast



Peri-nidal aneurysm & this portion of AVM no longer fill

How do we treat the rest of the AVM?

Surgical Resection

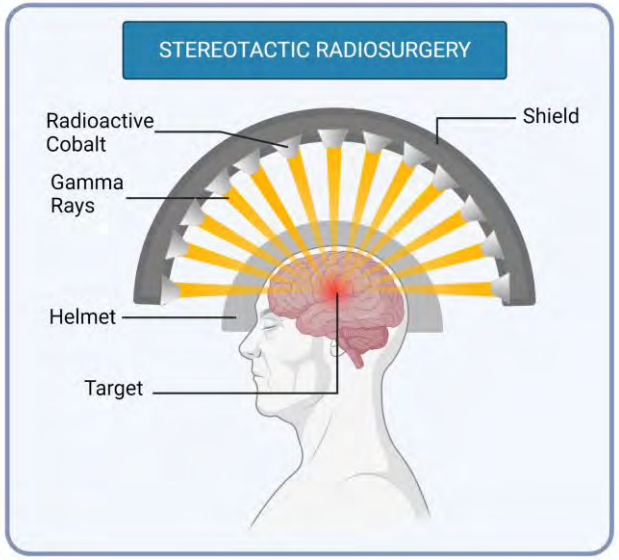
- Results are immediate
- Does dissection to AVM pass through eloquent vs non-eloquent brain tissue?
  - Vision, language, motor, sensory, balance

Catheter Embolization

- Results are immediate
- Must be able to access branch
- Is risk of reflux of glue/onyx acceptable?

Stereotactic Radiosurgery

- Results are delayed
- Is risk of radiation injury to surrounding tissue acceptable?



Nursing Considerations: Hemorrhagic Stroke

- Aggressive BP control (meds, nursing care)
- Obtain labs (coag) ASAP, med history
- BP control, bed position, pain medication
- Seizure prevention
- Expected Interventions/testing: CT, diagnostic angio, managing patient on road trips
- Post op angio care – assess/monitor groin site
- Frequent neuro checks

Nursing Considerations: Hemorrhagic Stroke

Documentation –

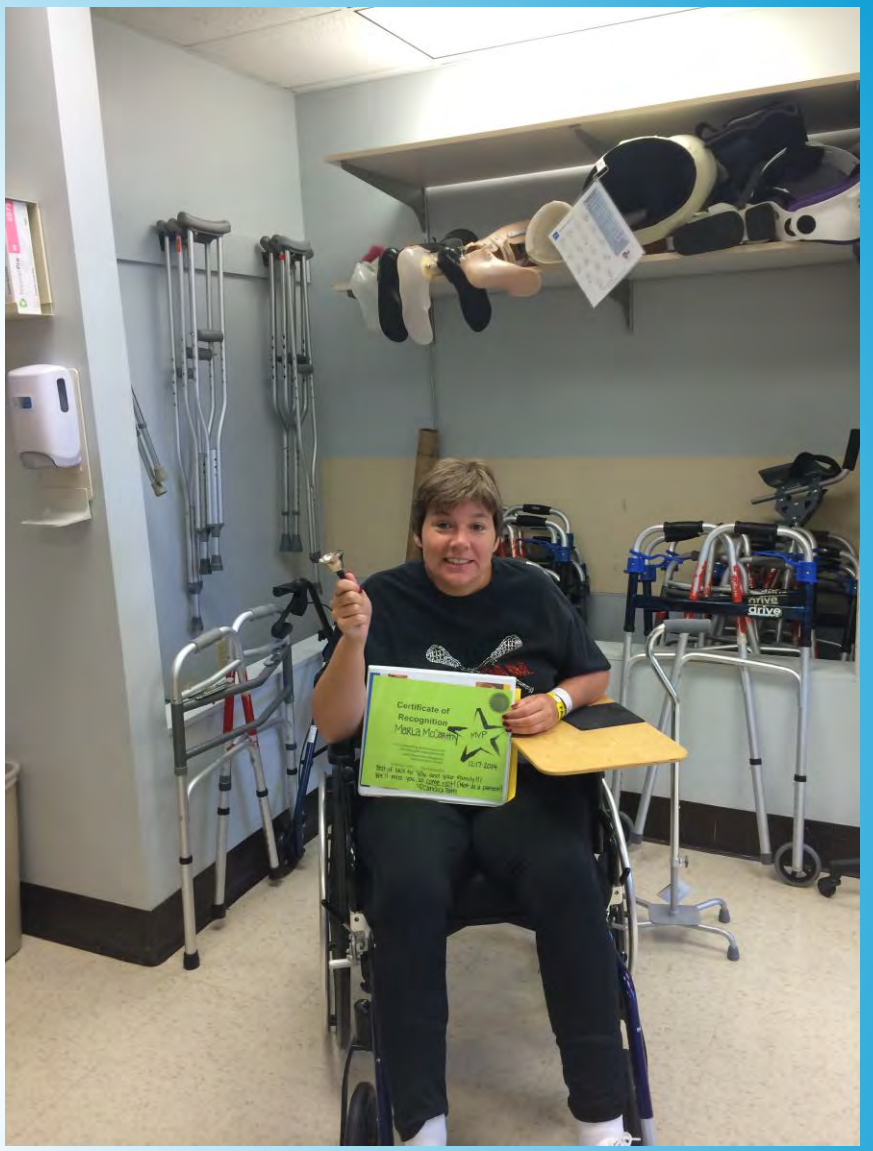
- Hourly GCS, pupils, focal deficits
- NIHSS

When should you call?

- Decreasing GCS,
- NIHSS changes by 4 or more
- Pupillometry changes by 0.7 or more.

Check your sleeping patient

Marla spent 4 days at St. Elizabeth and another 27 days at Tri-Health (including rehab)



Post Discharge Timeline

December 2014

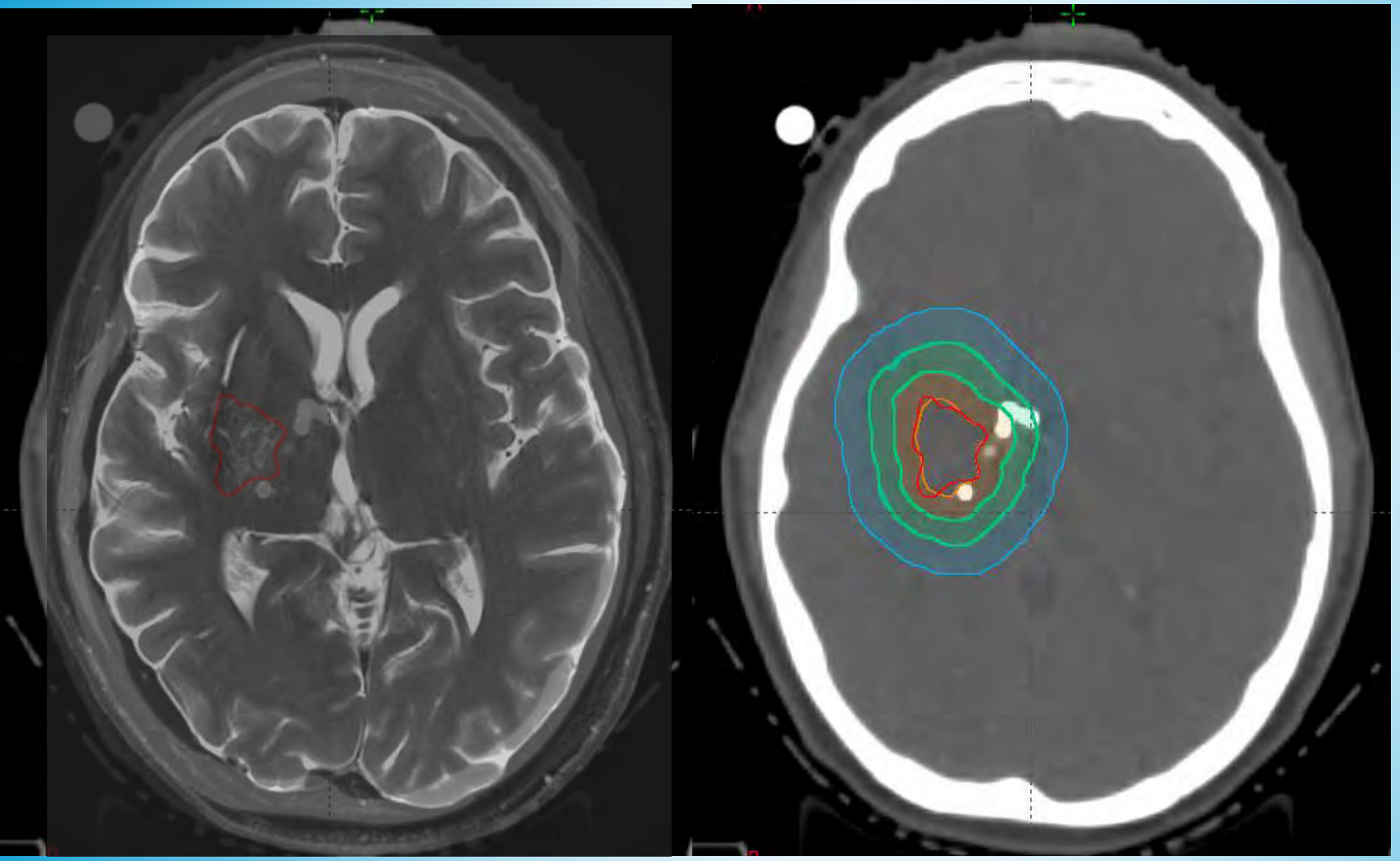
- Discharged home after Rehab with home PT/OT/ST
- Deficits: Left weakness/poor hand fine motor control, headaches, fatigue, DEPRESSION

February 2015

- Attempted another embolization- unable to access the AVM (no treatment)

April 2015

- Radiosurgery to shrink the remaining AVM
- Only had “one shot” for treatment



Stereotactic Radiosurgery April 2015

Red – Target
Orange – 18 Gy (100%)
Green – 9 Gy (50%)
Blue – 5.4 Gy (30%)

Post Discharge Timeline

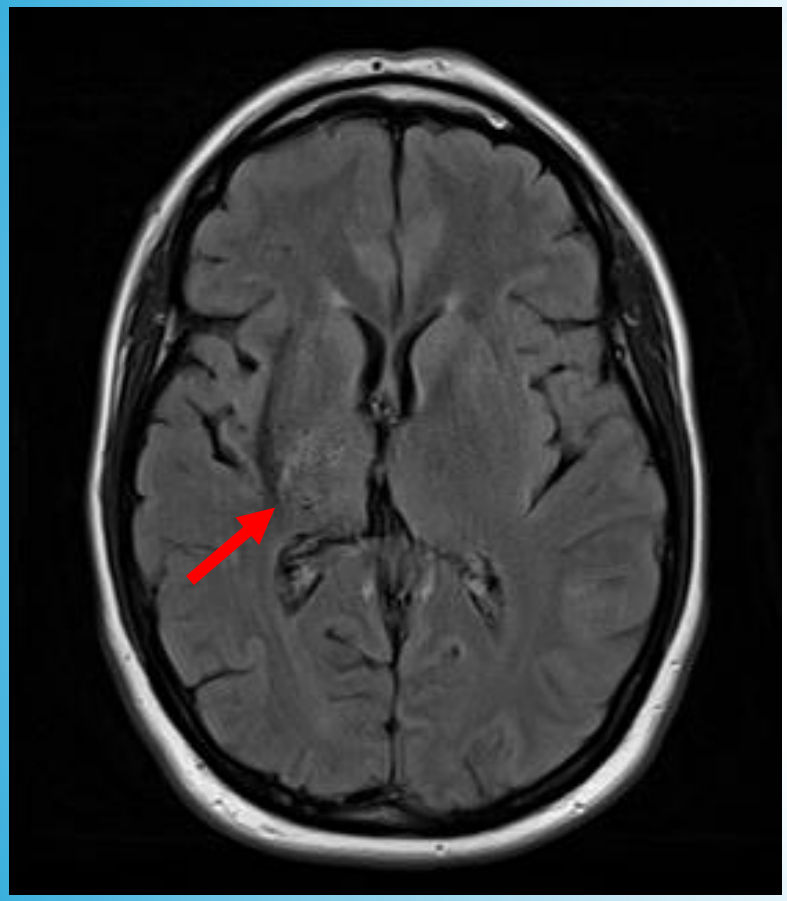
June 2015

- Returned to work
- Still had poor fine motor with left hand, fatigue, and depression

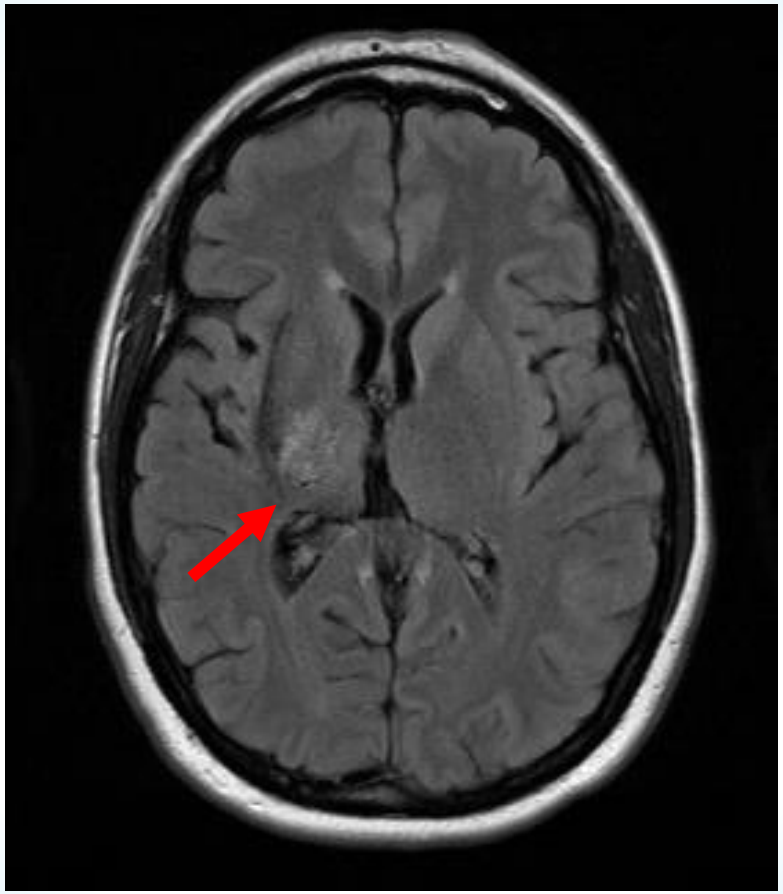
March 2016

- New symptoms started: limping, left arm weakness

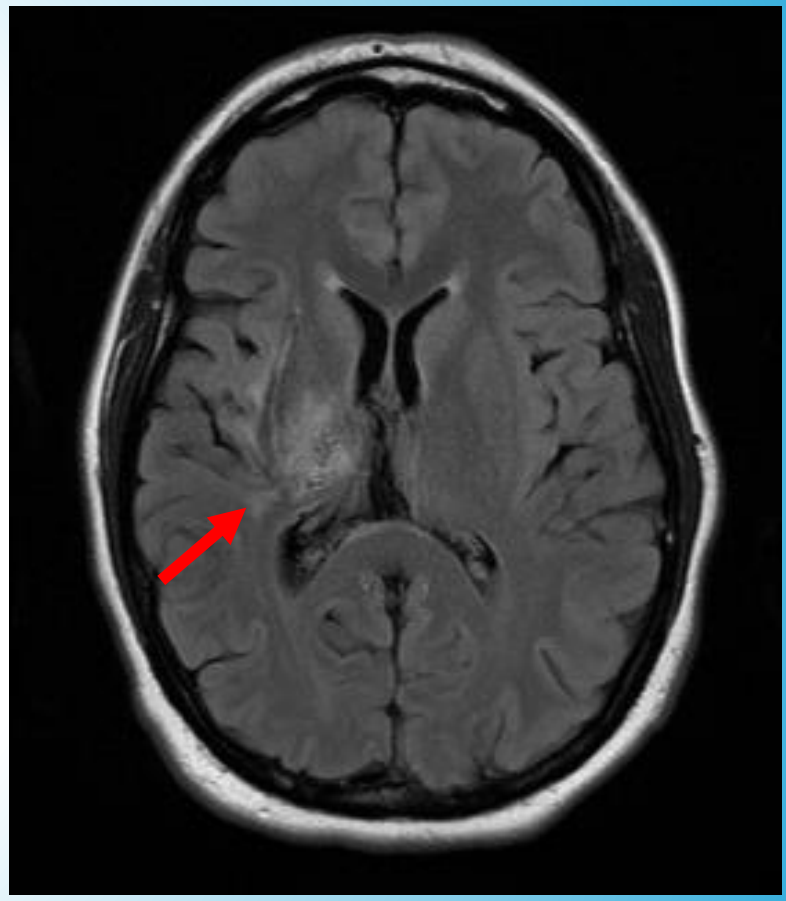
Radiation Injury (Necrosis) on MRI



October 2015



April 2016



September 2016

Life after Radiosurgery

- Depression. Life changed immediately- life as I knew it was stripped away.
- Completely new family dynamics-
- Psychiatrist @ time stopped working

- Spring 2016 started w/ new sx: limping- started therapy again, arm was also weak.
- Restarted therapy for new symptoms

Therapy

- Hospitalization and outpatient therapy
- Radiation set back
- Second round of Outpatient
- Spasticity complications, braces, botox & surgeries

Therapy

- Life Events
  - Back to work
  - Back to driving
  - Family events
  - Supporting her independence

- New Roles, new learning onward and upward!!!

Marla’s Wish list:

- Include family more in transition to home
- Better prepared for shift in family dynamics
- Understand that outward symptoms don’t tell the whole story

Marla – how is life today?

Had to stop working

Moved from 2 story house to a ranch house

Change of lifestyle – stopped smoking, lost weight

Marla – how is life today?

Grandma, loves to travel, regaining independence (driving)

Marla – the Advocate

Volunteers w/ PT/OT students “practice clinic”

GCSC member, brain aneurysm support group

Participates in Research studies

QUESTIONS?