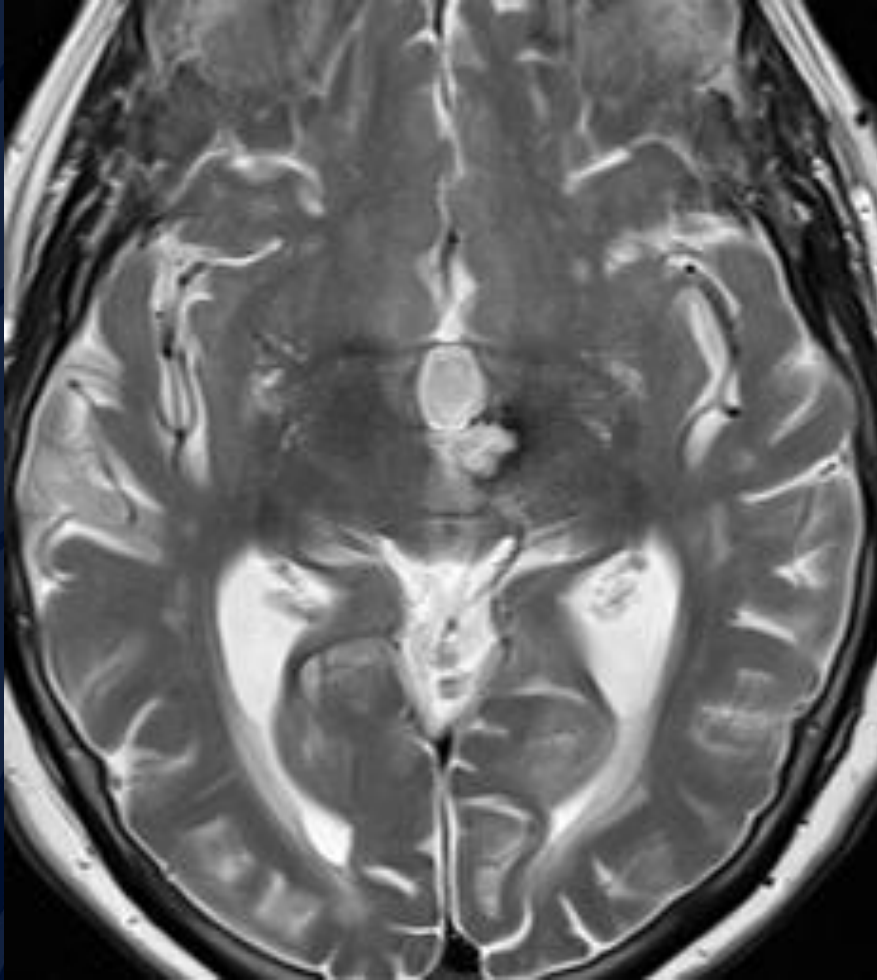


55F h/o “deep AVM” & word finding difficulty

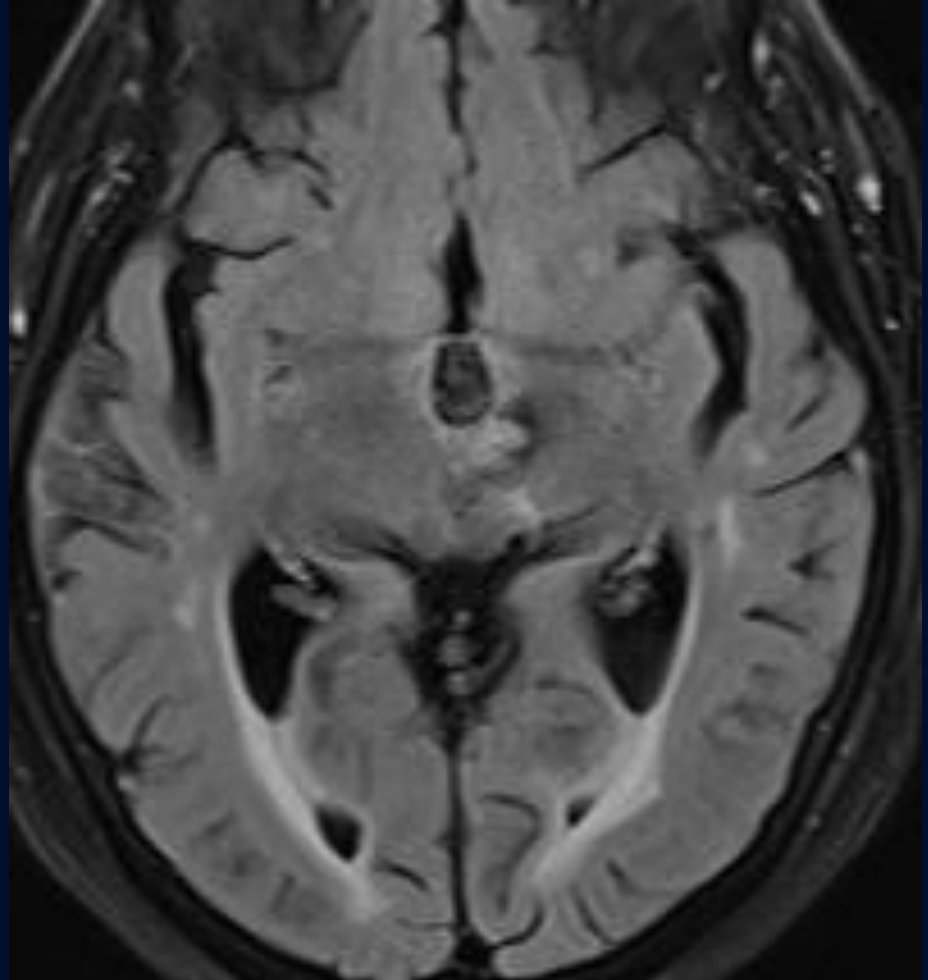
Krithika Srikanthan, MD

Leo Wolansky, MD

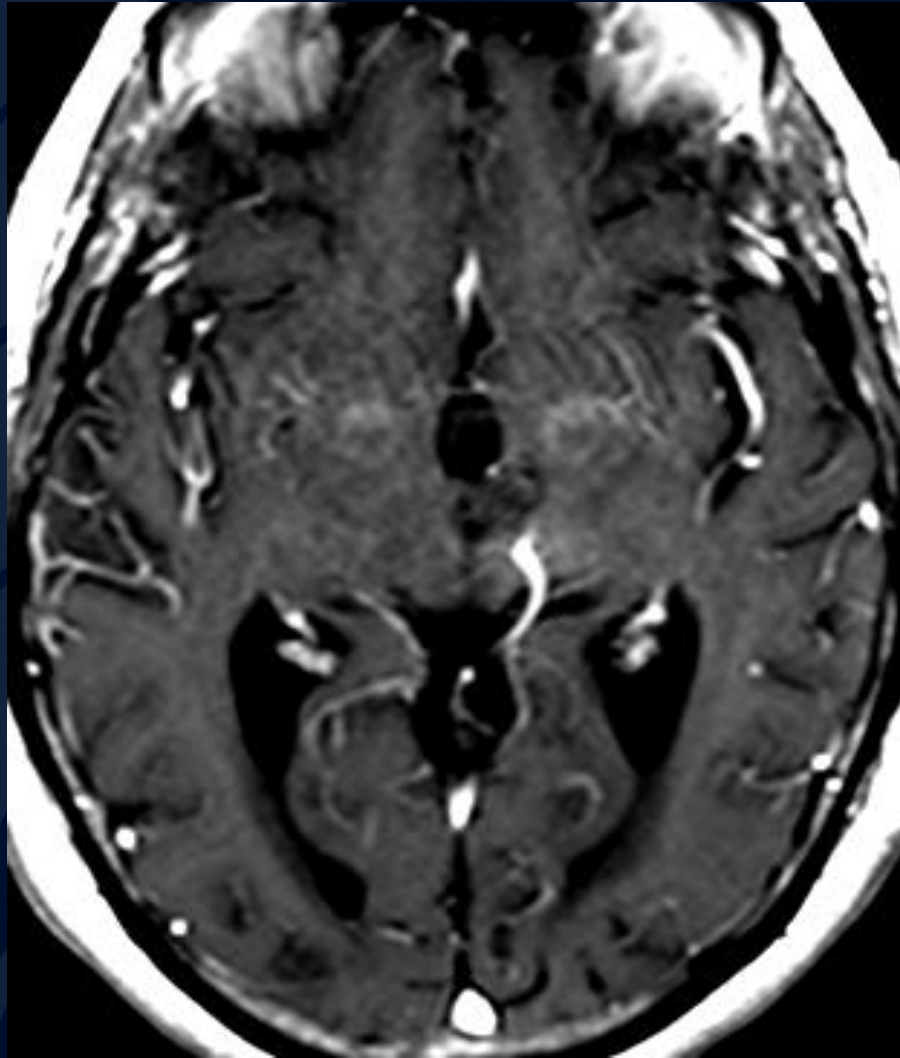
T2



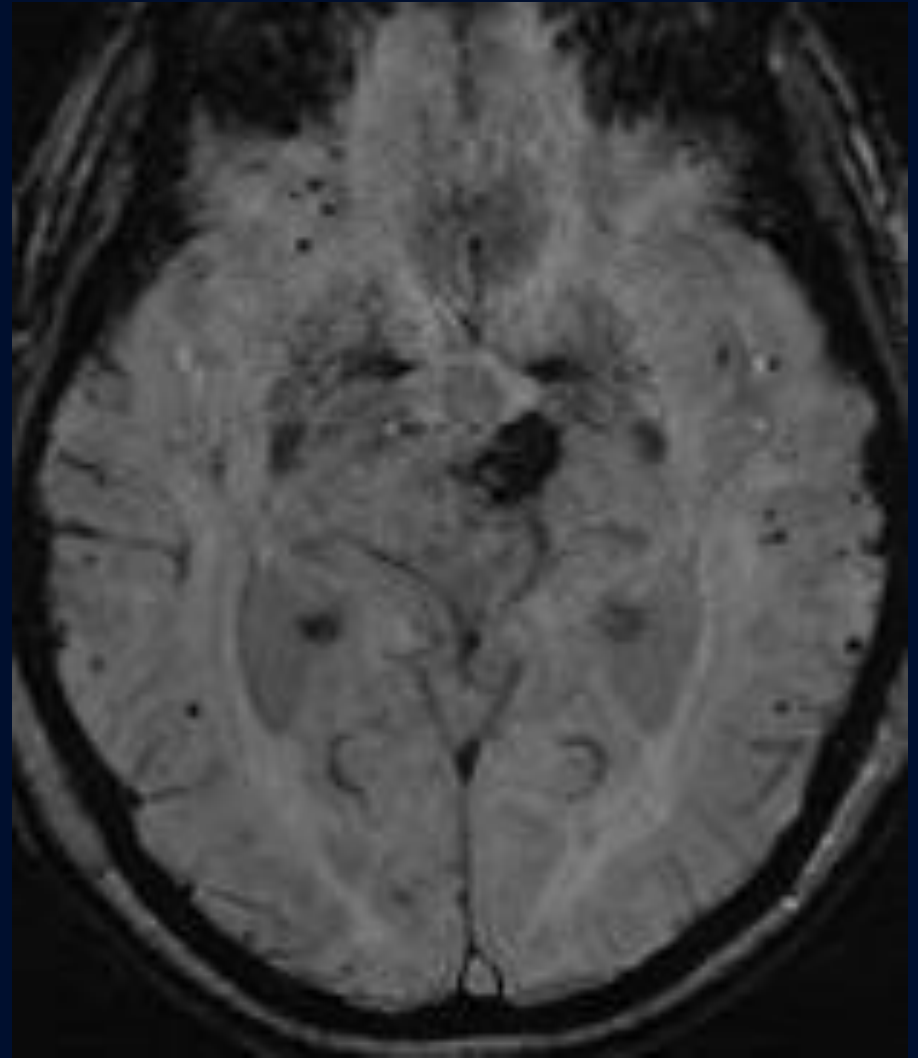
T2 FLAIR



T1-Gd



SWI

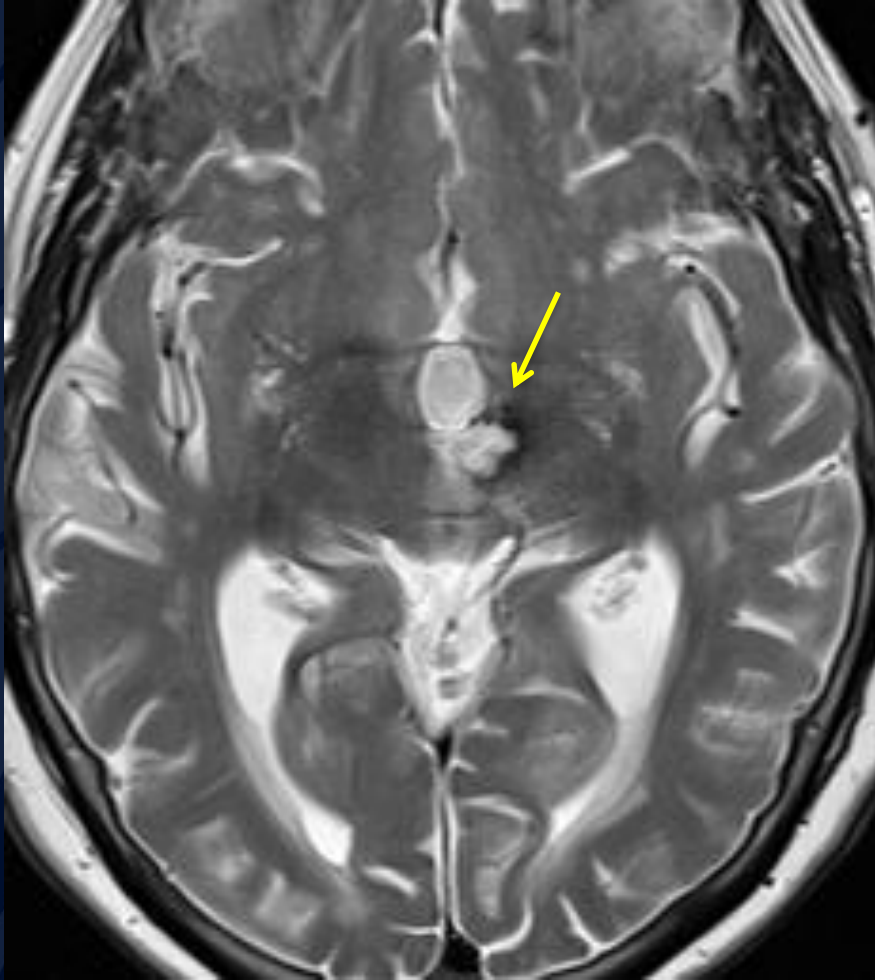


A large, stylized oak leaf graphic in a dark blue color, positioned on the left side of the slide. It features detailed vein patterns and a lobed edge.

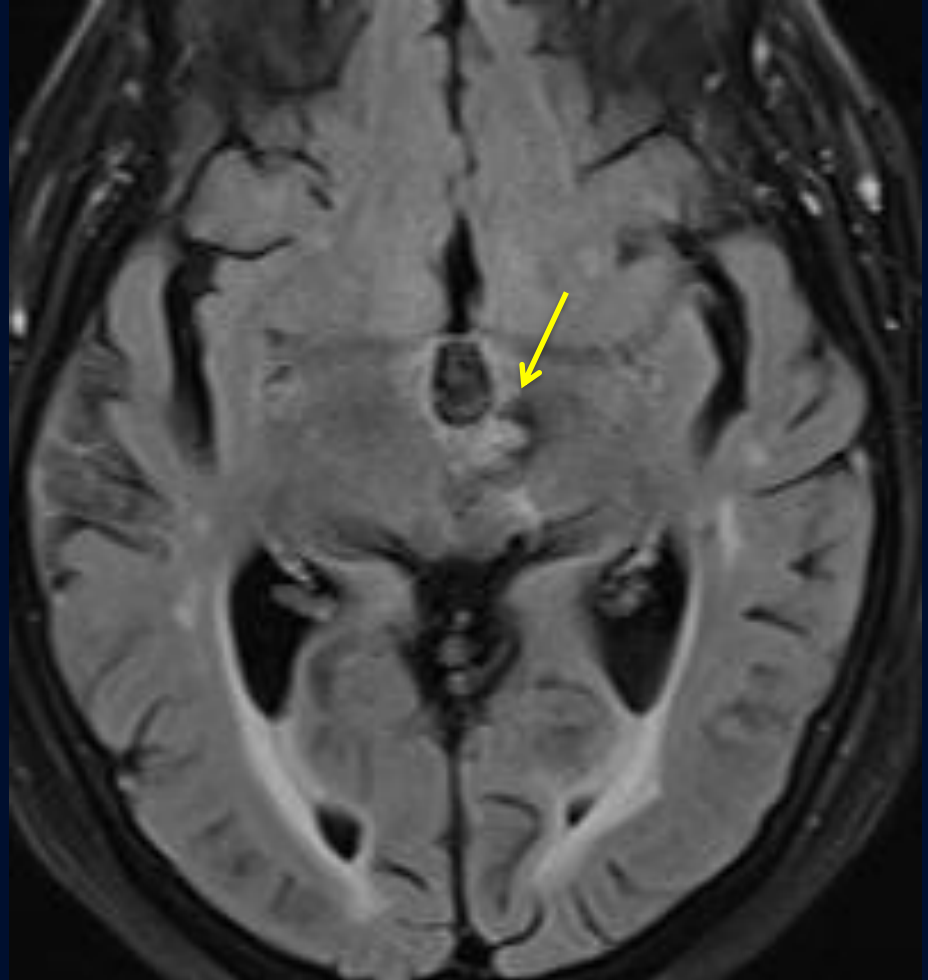
?

Vascular Malformation w/
Hemorrhage
Presumed Cavernoma / Venous
Angioma

T2



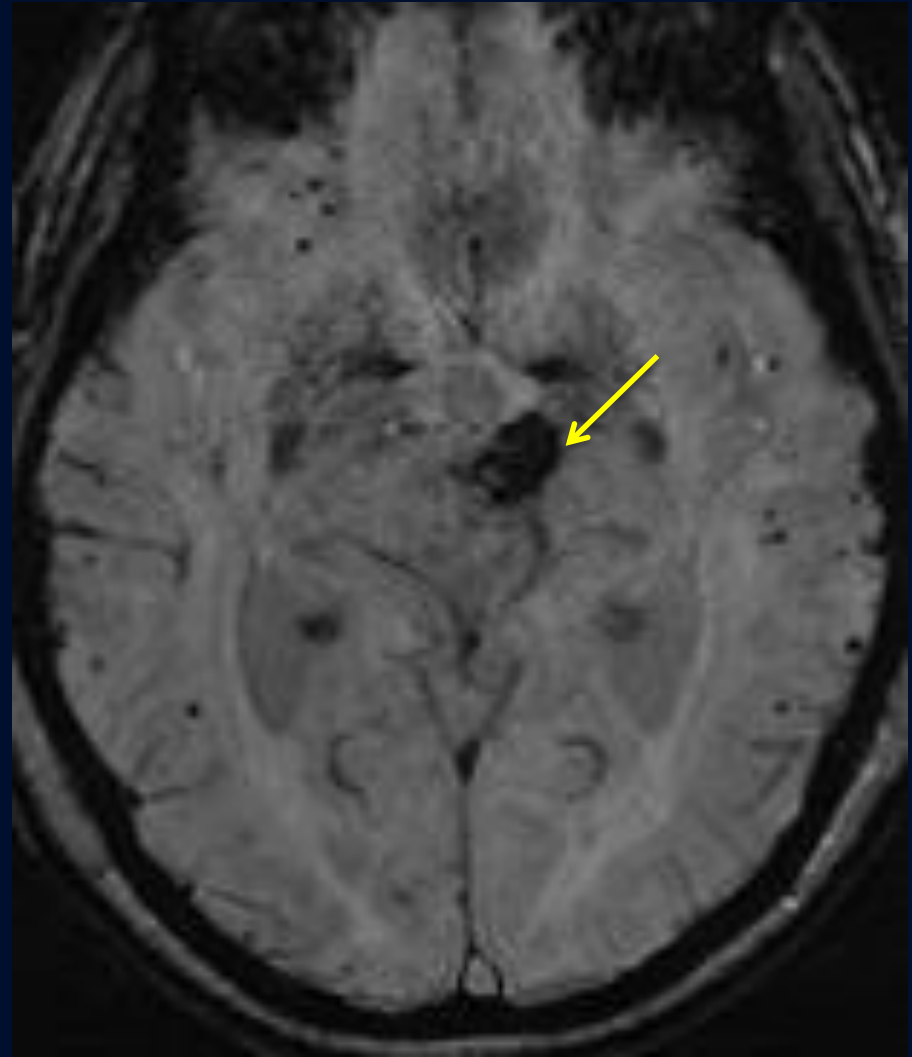
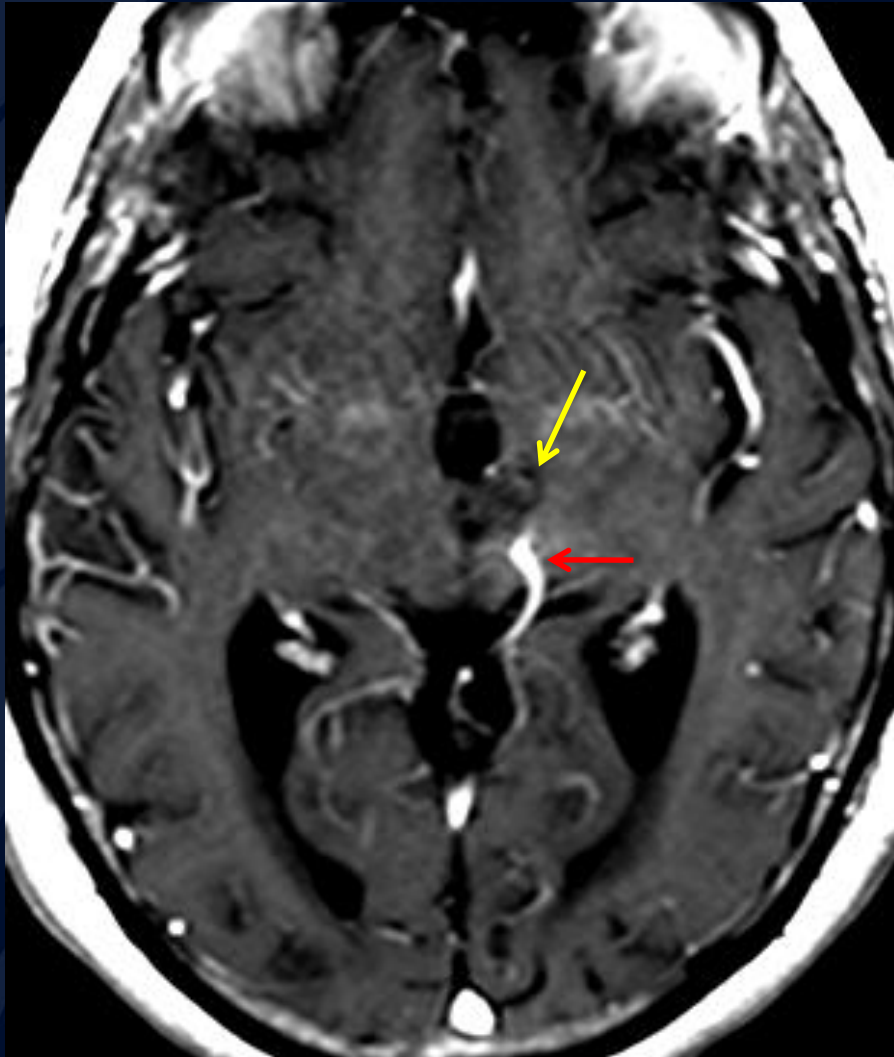
T2 FLAIR



Hemosiderin ring in the absence of known cause is presumed cavernoma (arrows)

T1-Gd
Cavernous Angioma / Venous Angioma

SWI



Presumed cavernoma (yellow arrows)
Draining vein suggests mixed angioma

Cavernoma MRI findings

- T1WI

- Variable, depending on hemorrhage/stage
- "Popcorn ball" appearance of mixed hyper-, hypointense blood-containing locules
- Less common: Acute hemorrhage (nonspecific)
- Central hyperintensity is classic
- Helps differentiate CM from other hemorrhagic masses

- T2WI

- **Area of mixed signal intensity with central reticulated core + peripheral rim of decreased intensity (hemosiderin rim)**
- "Popcorn ball"
- Locules of blood with fluid-fluid levels

- FLAIR

- May show surrounding edema in acute lesions

- T2* GRE / SWI

- Prominent susceptibility effect (hypointense "blooming")
- Multiple CMs: Numerous punctate hypointense foci ("black dots") on GRE scans are most common finding
- SWI much more sensitive than GRE

- T1WI C+

- Minimal or no enhancement (may show associated venous malformation)
- DVA often associated

- Angiography

- "angiographically occult vascular malformation"
- Usually normal unless mixed with a DVA

Zabramski Classification Cavernous Angiomas

MR sequence	MR Imaging Findings	Histopathology
Type 1		
T1	Hyperintense core	Subacute hemorrhage
T2	Hyper/Hypointense core	“
Type 2 (MOST COMMON)		
T1	Reticulated, mixed signal intensity core "popcorn ball" lesion	Lesion w/ hemorrhage and thromboses of varying ages
T2	Reticulated, mixed signal intensity core with hypointense rim "popcorn ball" lesion	“
Type 3		
T1	Iso/Hypointense	Chronic hemorrhage with hemosiderin staining in and around lesion
T2	Hypointense lesion with hypointense rim that magnifies the size of the lesion	“
Type 4		
T1	Not visible	Tiny lesion or telangiectasia
T2	Not visible	“
GRE	Punctate hypointense lesion	“

Cavernous Angiomas (i.e. Cavernous Malformation, Cavernous Hemangioma, Benign Vascular Hamartoma)

- Congenital vascular hamartomas consisting of sinusoidal collection of blood vessels.
 - NO interspersed brain tissue (as opposed to other vascular malformations)
 - Contain blood products of various age, calcifications, gliosis
 - NO feeding artery
- Prevalence: 0.5%-0.7%; M=F; 40-60y peak presentation
- 1/3 Familial Auto Dom (multiple lesions common; higher risk of hemorrhage) vs 2/3 Sporadic
- Presentation: seizure (50%), focal neurologic deficits (25%), symptoms after hemorrhage (which is usually small/low pressure), asymptomatic (20%), recurrent hemorrhage, chronic HA.
- Location: Hemispheres > brainstem, cerebellum
- Size: 0.5 - 4cm
- Rx: Total removal via microsurgical resection (If mixed DVA, venous drainage must be preserved)
 - Gamma knife therapy is an option if location is difficult

References

- Statdx
- Radiopaedia
- The Requisites Neuroradiology
- <http://pubs.rsna.org/doi/full/10.1148/radiology.214.1.r00ja19209>