

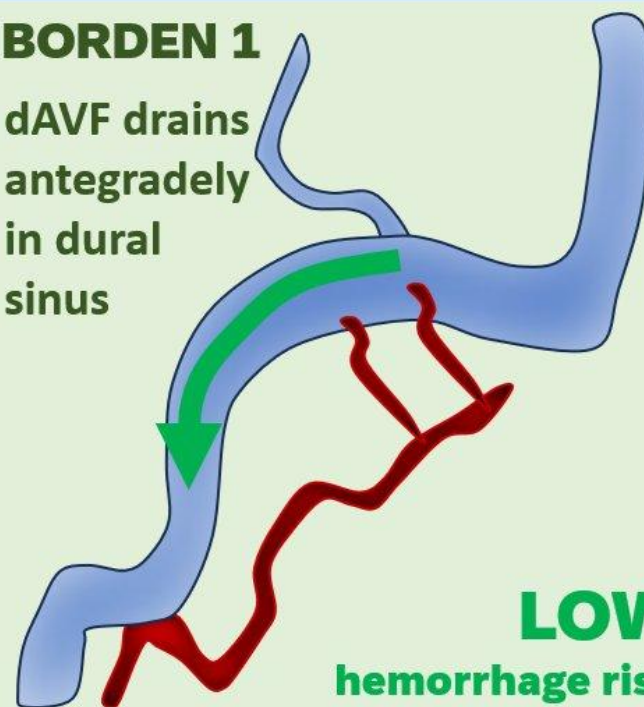
## No Fistula



@theneuroradiologist

## BORDEN 1

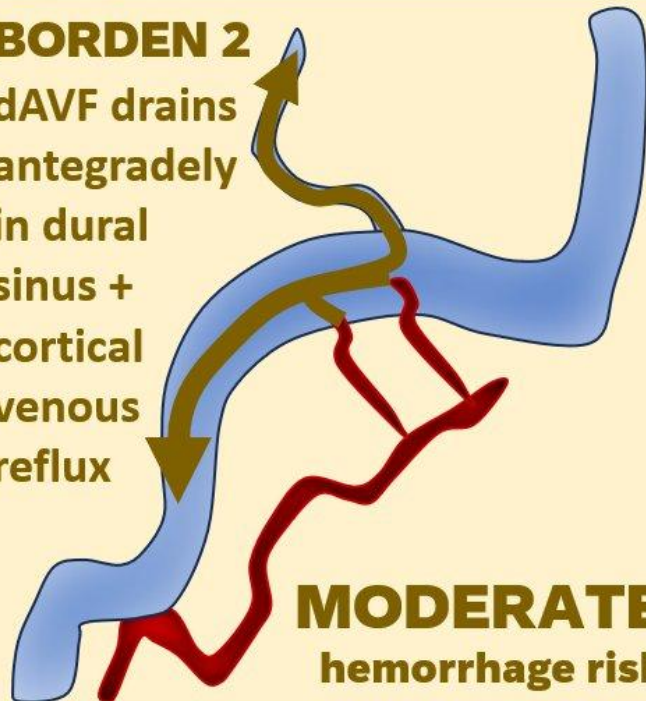
dAVF drains  
antegradely  
in dural  
sinus



**LOW**  
hemorrhage risk

## BORDEN 2

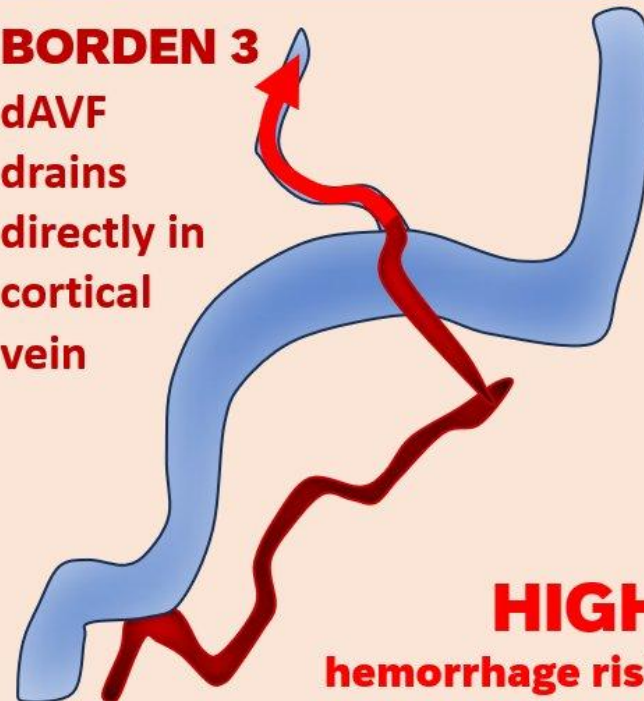
dAVF drains  
antegradely  
in dural  
sinus +  
cortical  
venous  
reflux



**MODERATE**  
hemorrhage risk

## BORDEN 3

dAVF  
drains  
directly in  
cortical  
vein



**HIGH**  
hemorrhage risk

# Borden Classification

- Type I- antegrade or retrograde flow into DVS/MV
- Type II- antegrade or retrograde flow into DVS/MS and RLMD
- Type III – RLMD only
- Type III has the highest rate of hemorrhage

# Dural AVF

- Can be congenital or acquired
- Acquired can be secondary to trauma, craniotomy, or venous sinus thrombosis
- Rat model
- Type III are the easiest to treat by obliterating the draining vein, which leads to obliteration of the fistula

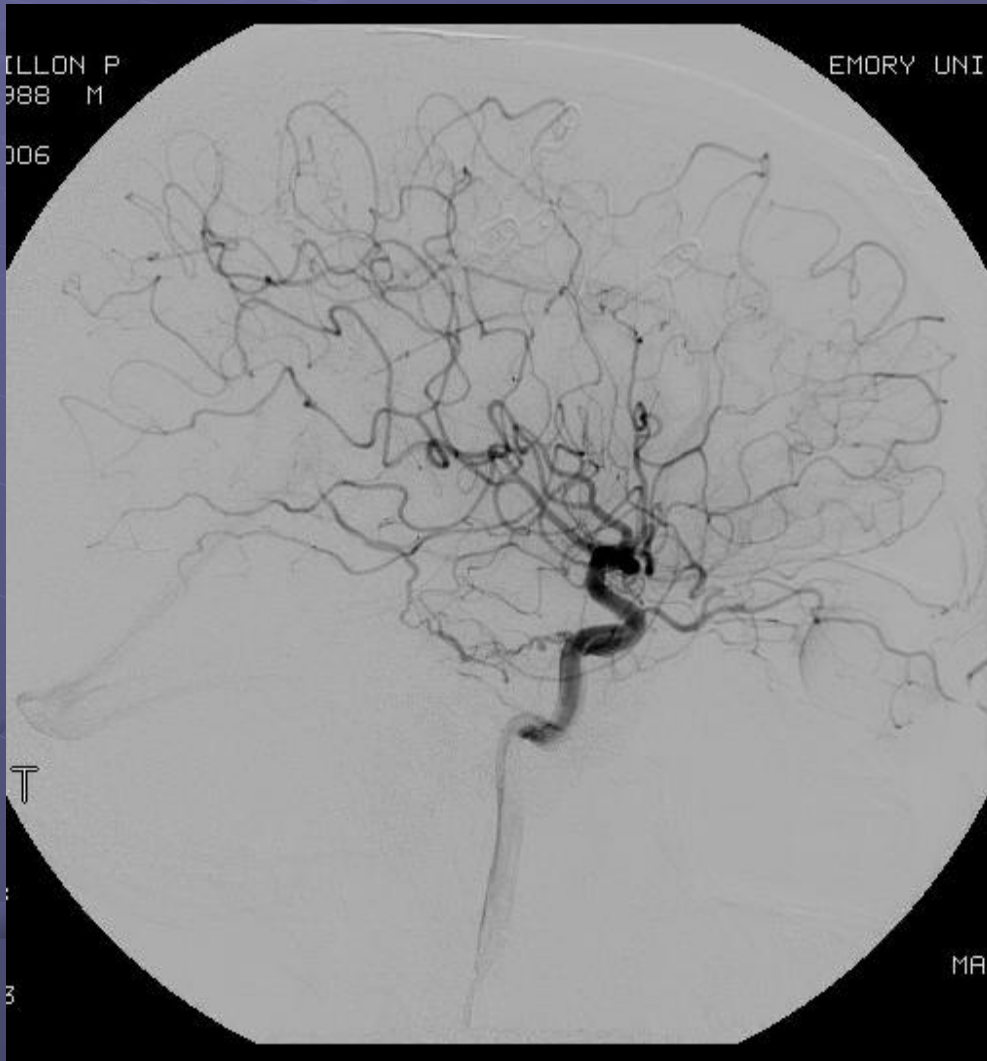
# Dural AVF

- 1/10 as common as intraparenchymal counterparts
- Occasionally involute on their own
- Present with hemorrhage, sz, neurological deficit, tinnitus, bruit, venous htn, reversible dementia
- Anterior cranial fossa or tent locations tend to have an aggressive course



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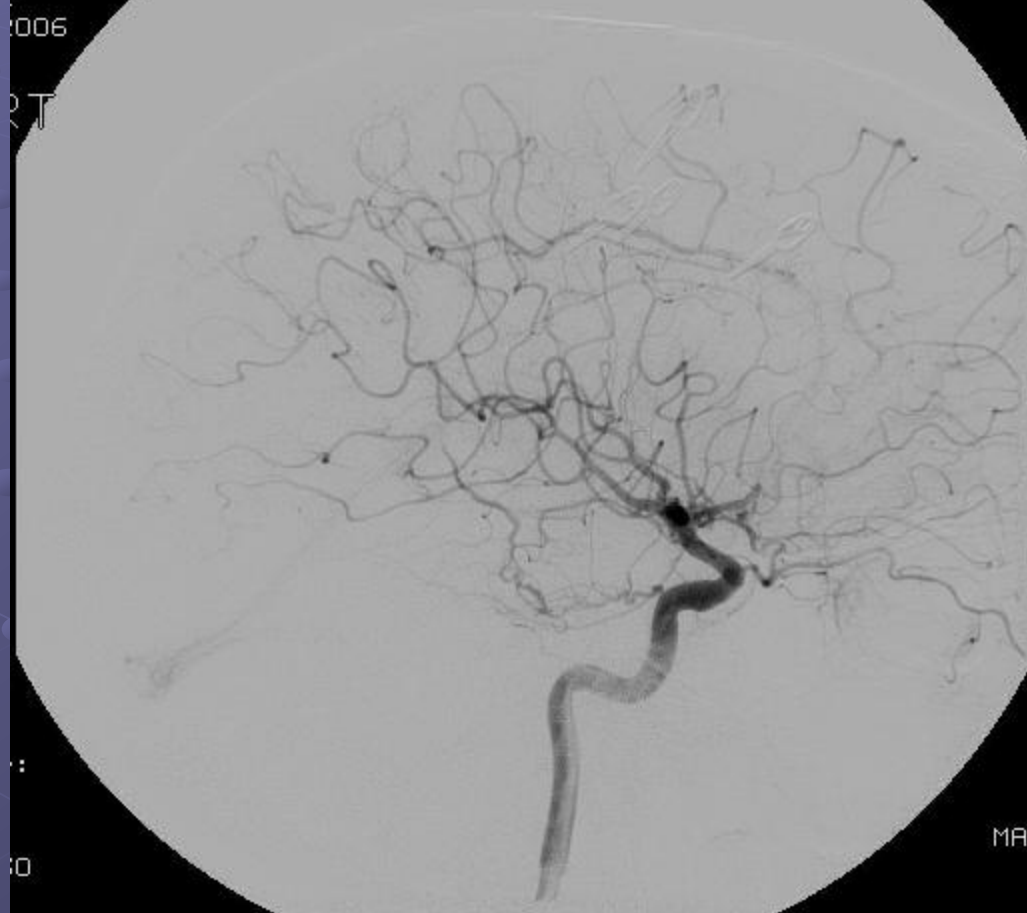
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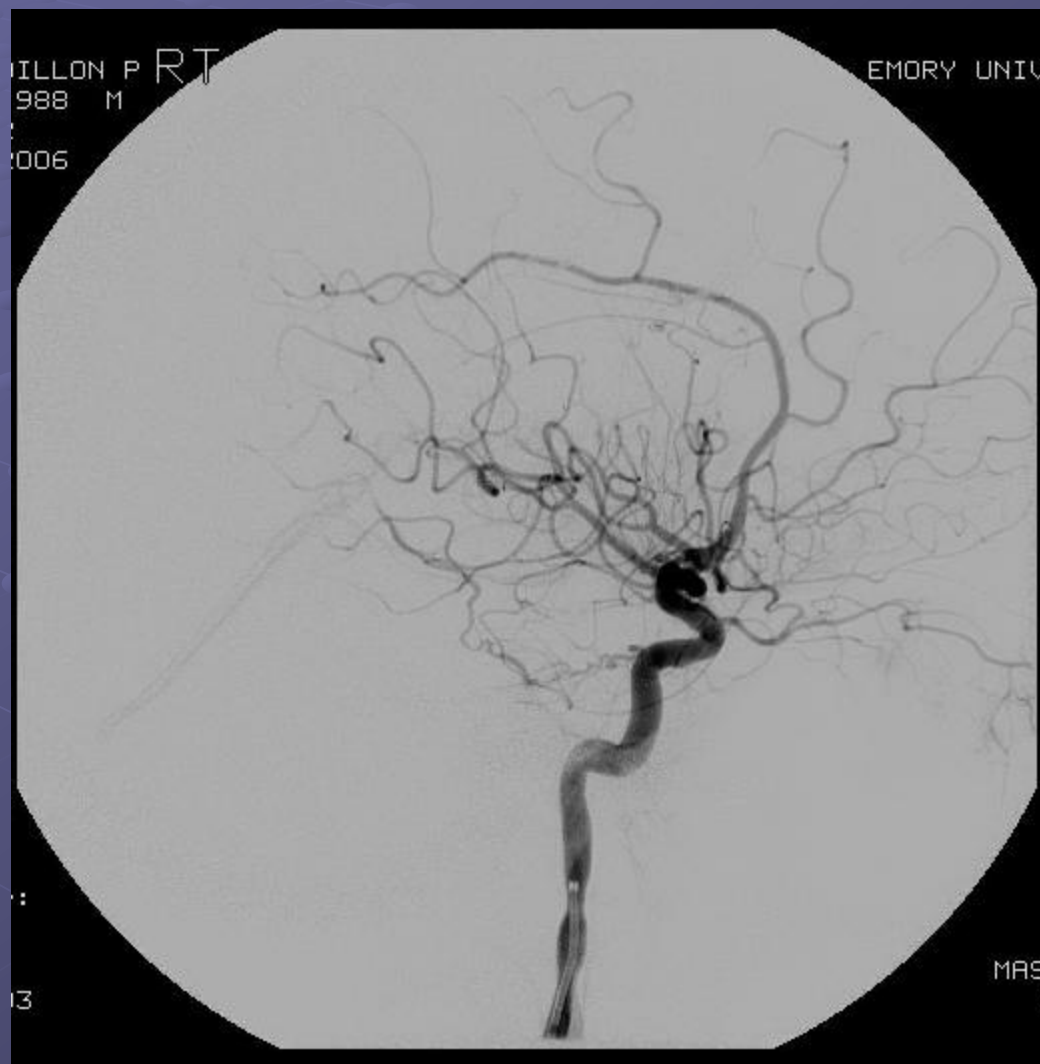
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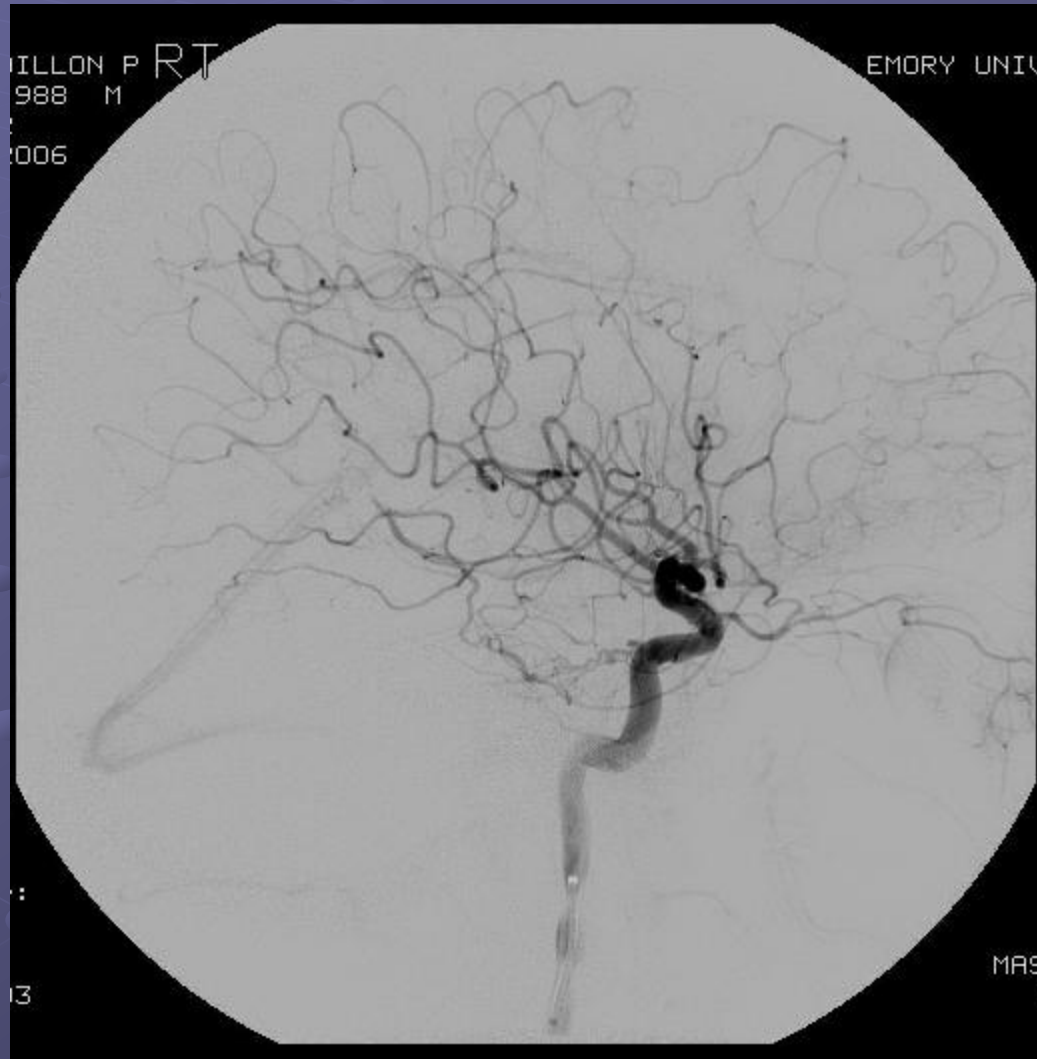
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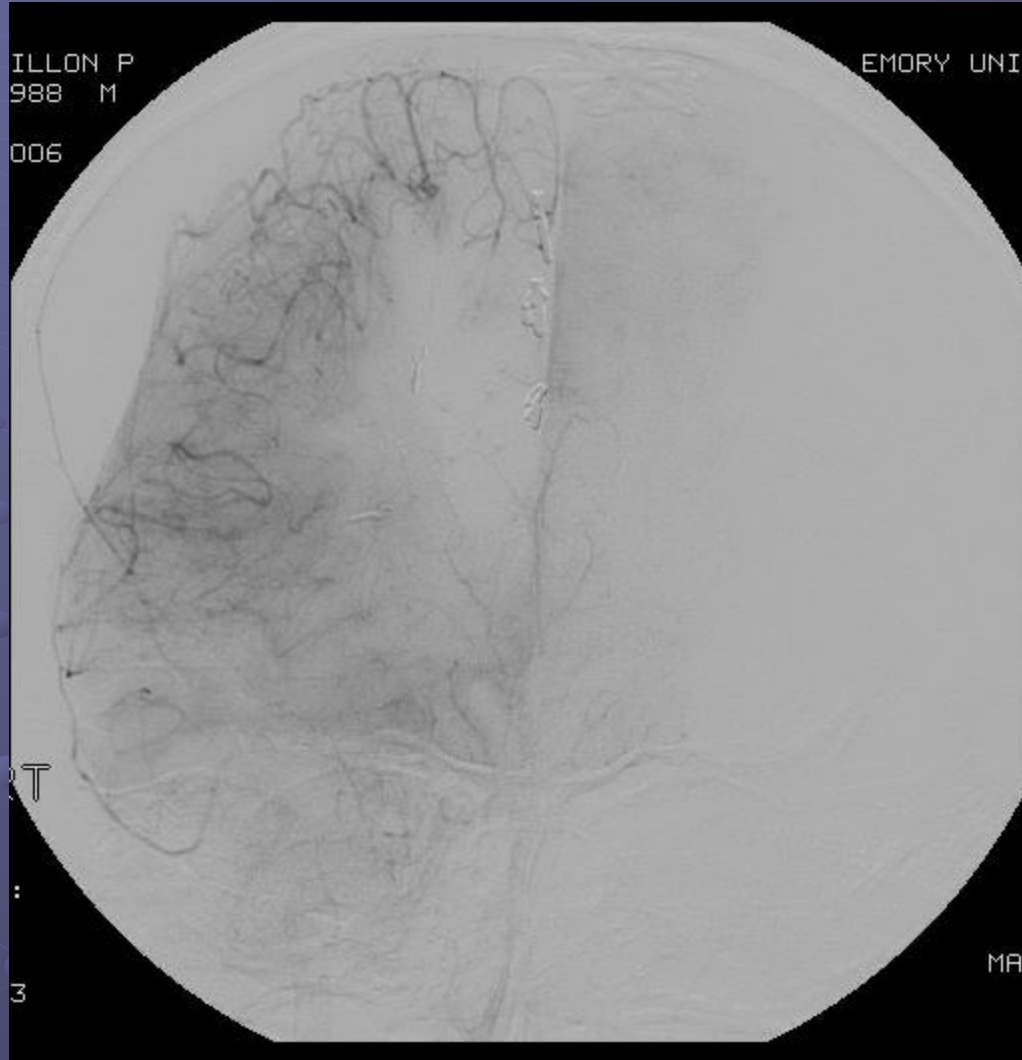
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# Dural arteriovenous fistula

Multiple small branches of the left external carotid artery directly communicating with the left sigmoid and transverse sinuses



# Dural arteriovenous fistula

- Most DAVFs receive their supply from branches of the external carotid system or dural branches of the internal carotid or vertebral arteries.
- May develop signs of intracranial venous HTN, Tinnitus, orbital congestion.
- Drain most commonly into the transverse or sigmoid sinus or the cavernous sinus



# DDX:

- Diffuse intracranial atherosclerosis
- Intravascular metastasis (especially those from atrial myxoma or choriocarcinoma)
- Vasospasm associated with SAH
- Vascular changes associated with neurocutaneous syndromes
- rare cases of intracranial fibromuscular disease.

# DAVF

- **Peak age of discovery 5<sup>th</sup> to 6<sup>th</sup> decade**
  - May occur in all ages from neonates to aged
    - Increasing incidence of DAVF in children
      - Then to be more complex and more aggressive
  - Higher incidence in women (2:1), particularly with DAVF of the cavernous and transverse sigmoid sinuses
  - Incidence: 10-15% of all cerebral malformations diagnosed with cerebral angiography
  - Referral bias due to protean manifestation of these malformations

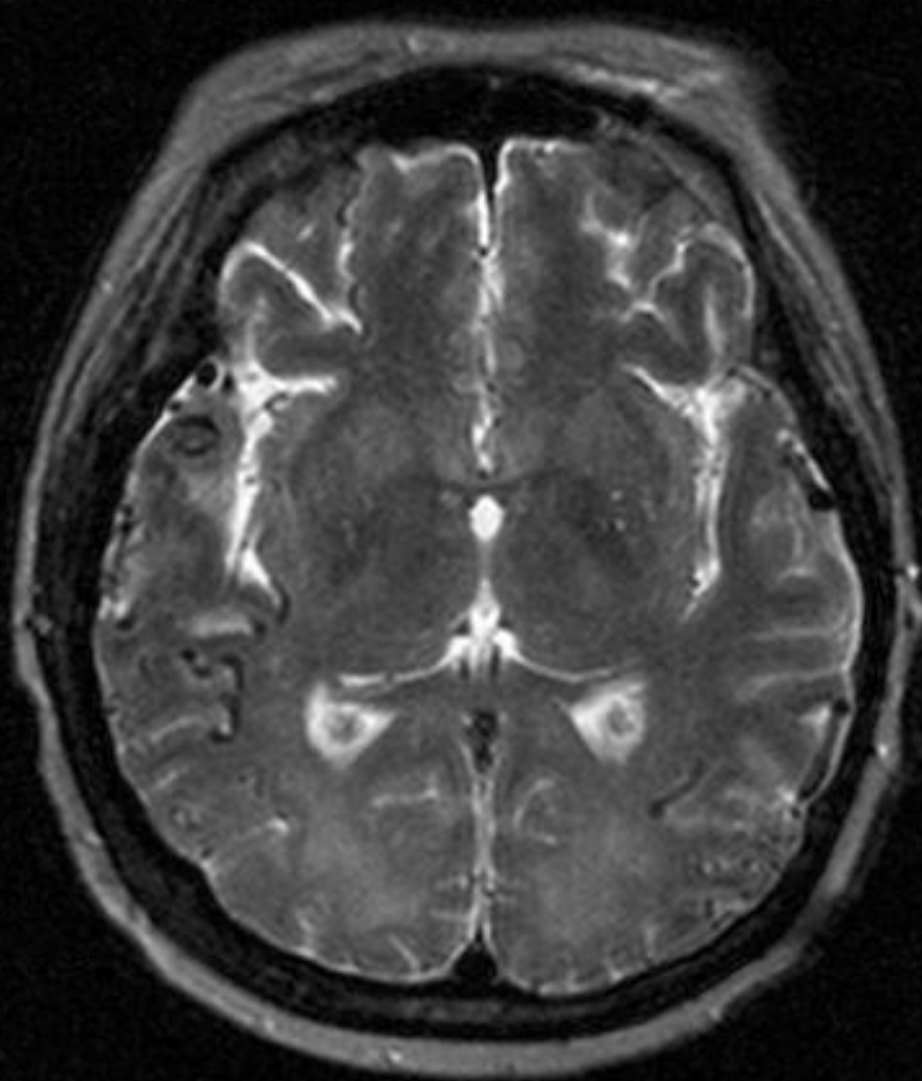
Borden Type II dural AV fistula with  
feeders from the  
left Meningohypophyseal trunk

# Borden Classification

- Grouped into three types based upon their venous drainage:
- **Type I:** Dural arterial supply drains into sinus. Flow is normal (ie antegrade within the venous sinus)
- **Type II:** Dural arterial supply drains into venous sinus. Typically stenosis forms in distal sinus and High pressure in sinus results in retrograde drainage into the superior sagittal sinus and out the cortical veins
- **Type III:** dural arterial supply drains retrograde directly into cortical veins. Some times after type II repair.
- **Type II and III – high morbidity, needs treated.**

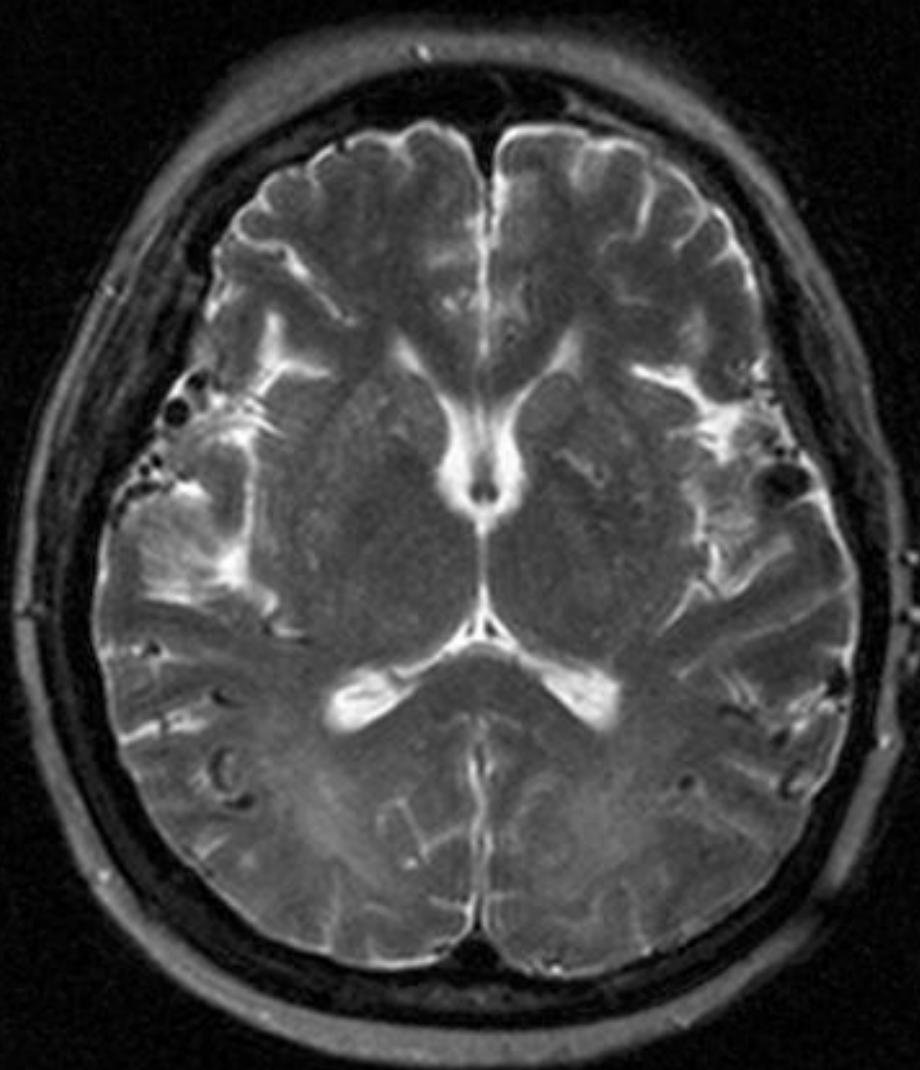


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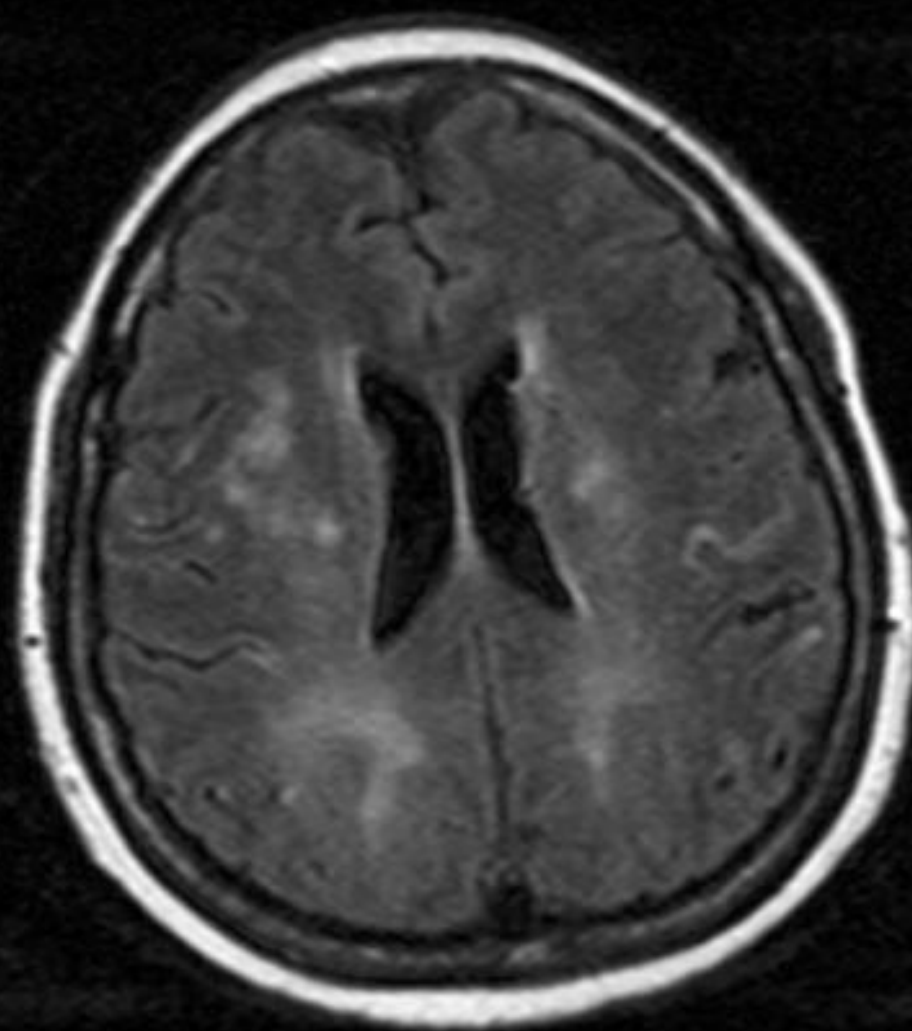




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