63 y/o woman presenting with headache and sudden onset of aphasia

Martin Ollenschleger, MD

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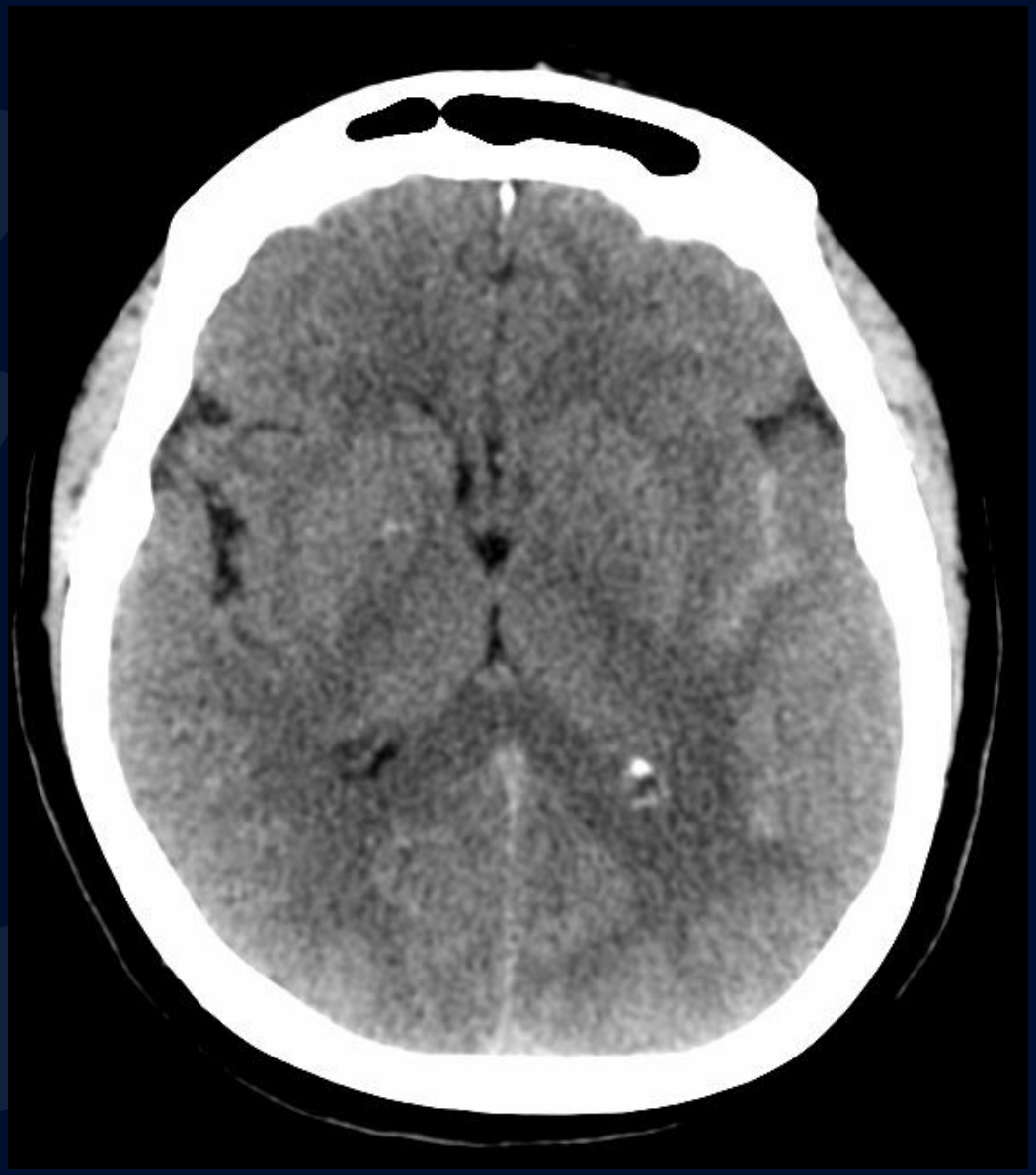

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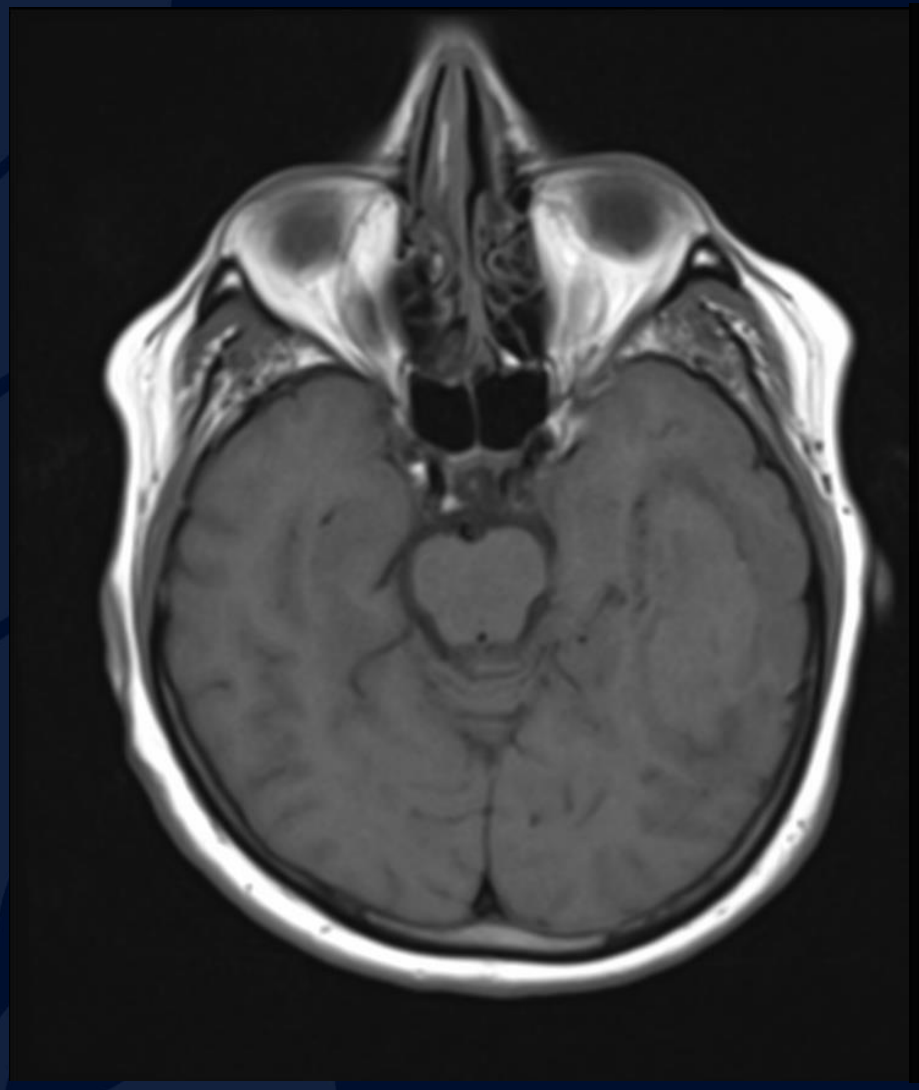

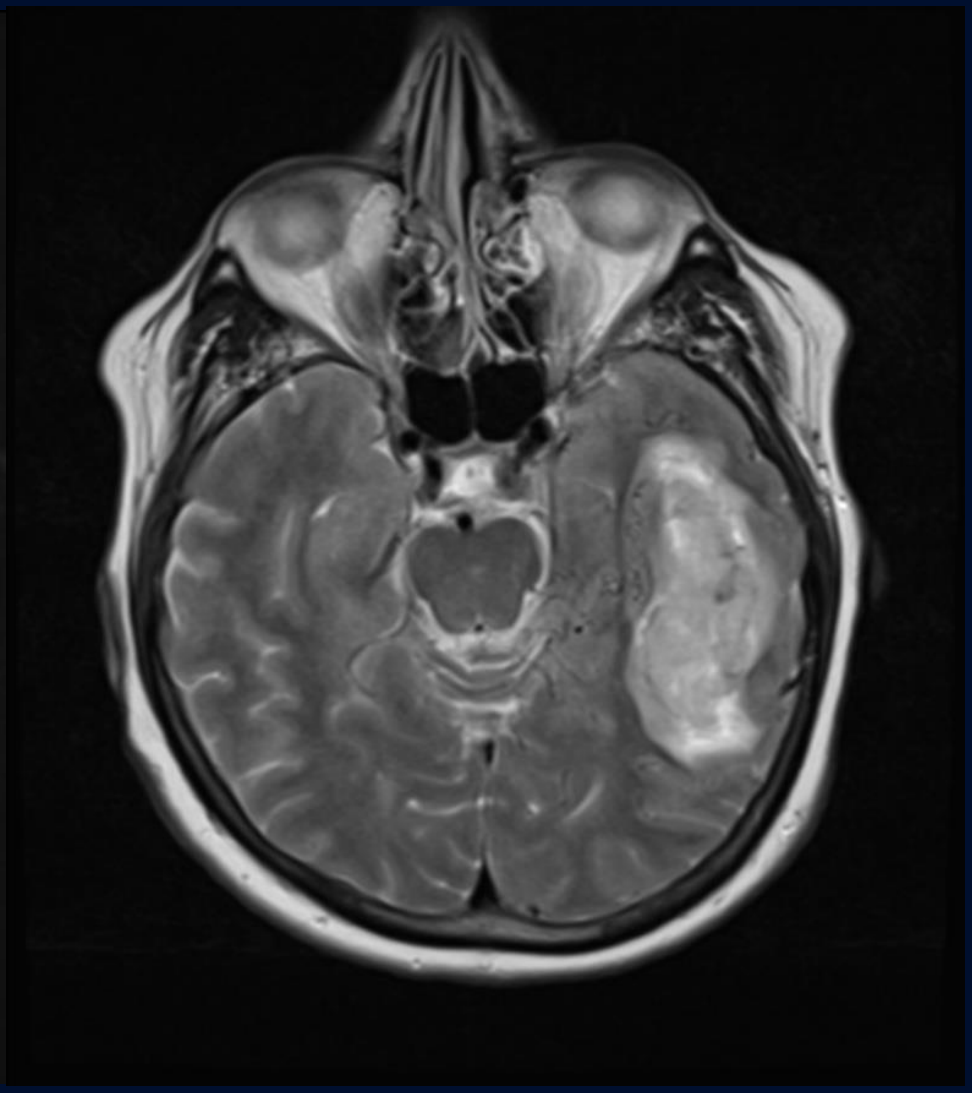

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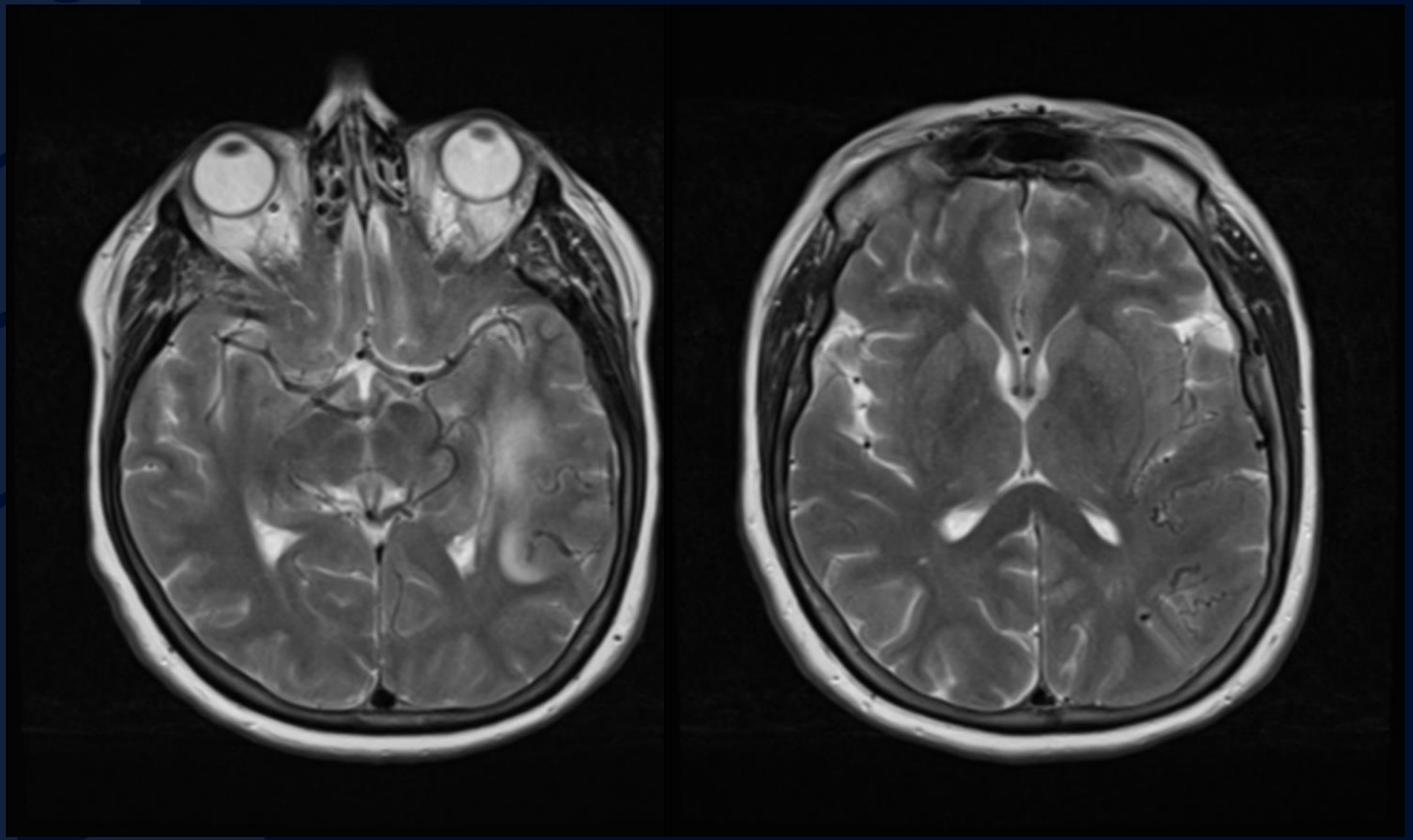

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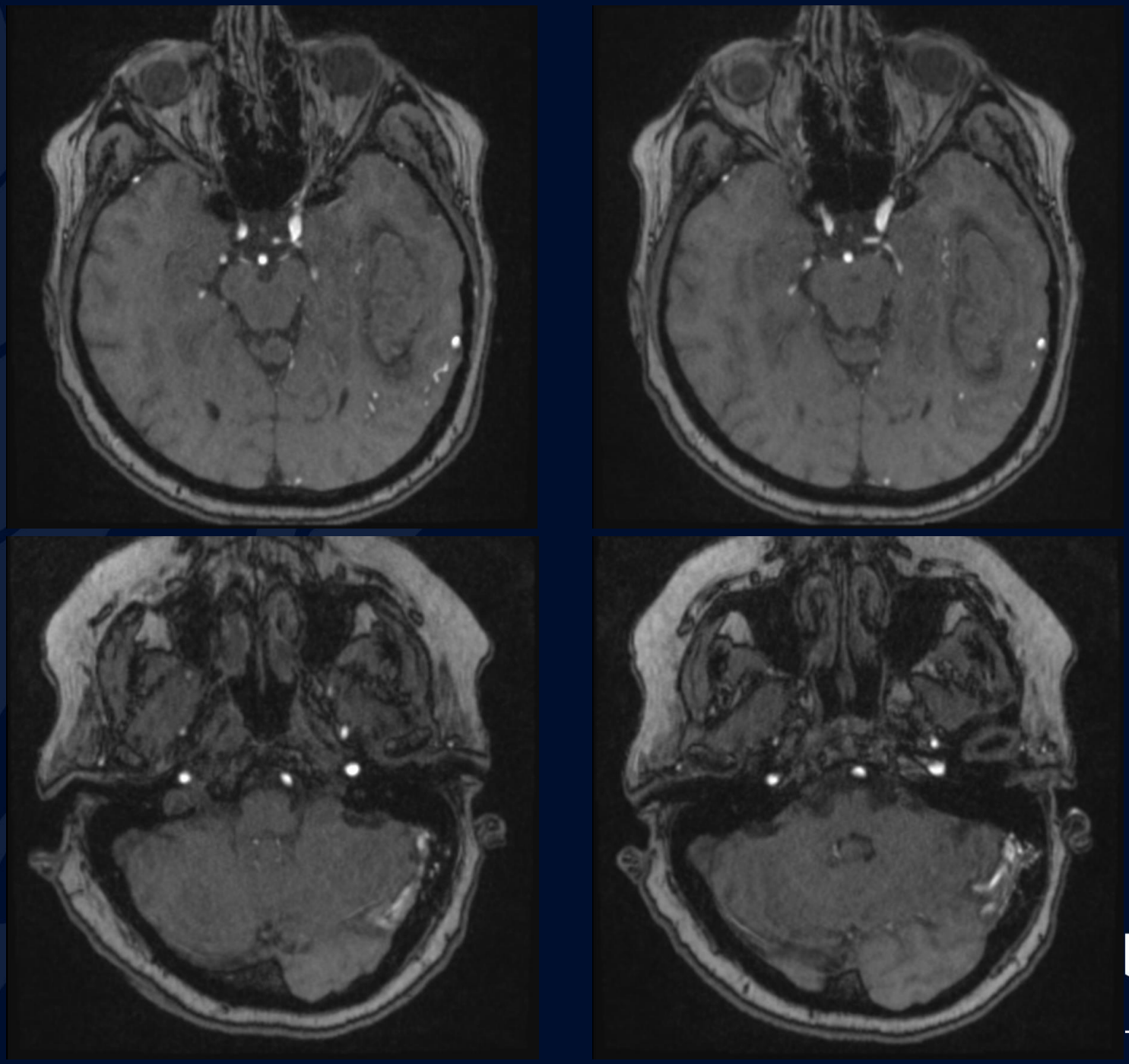

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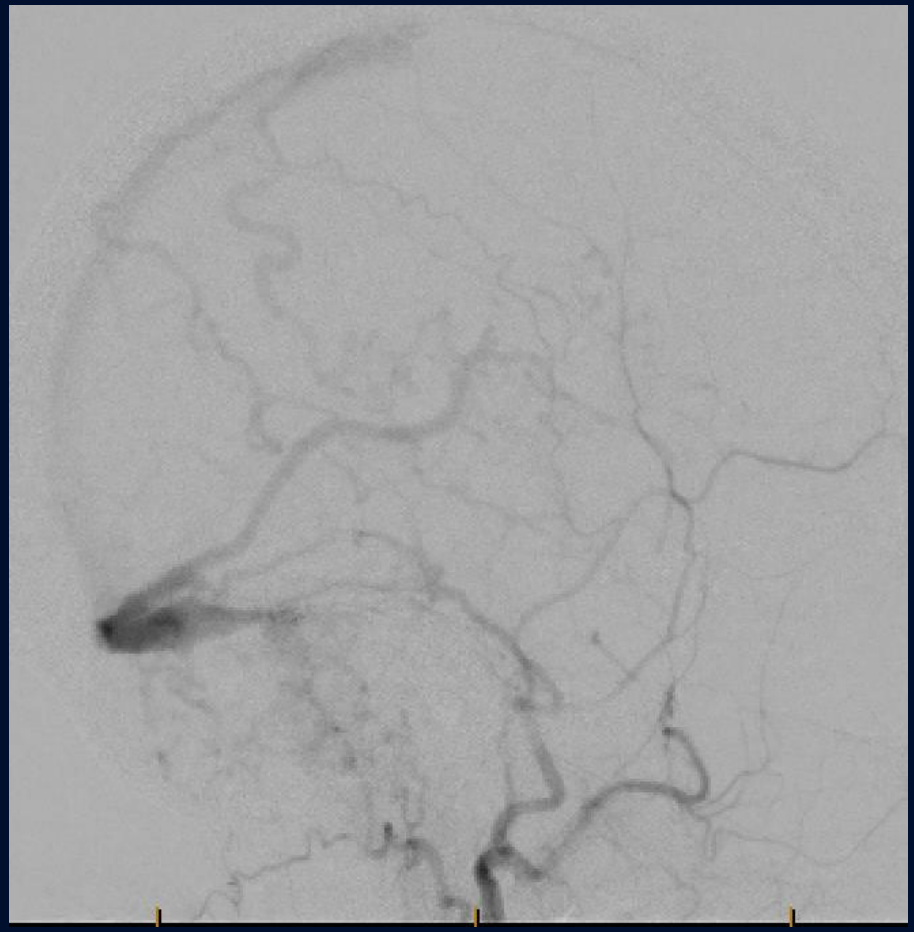

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Acute ICH Secondary to Dural Arteriovenous Fistula

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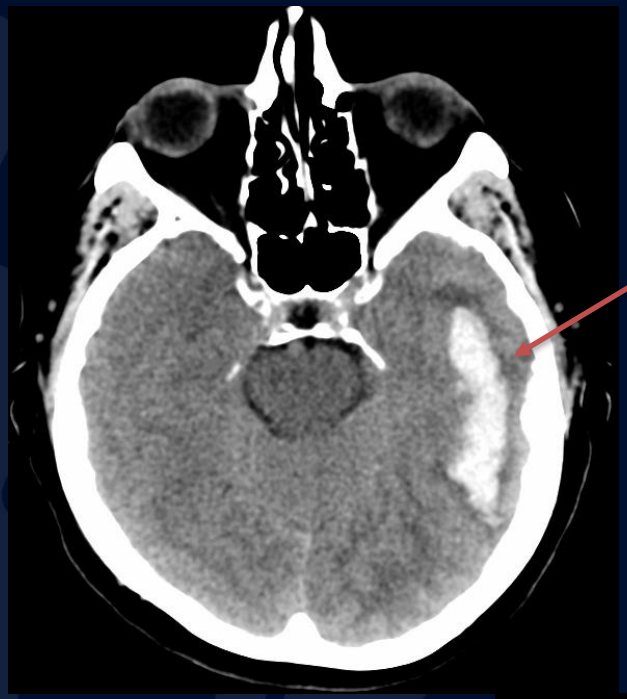
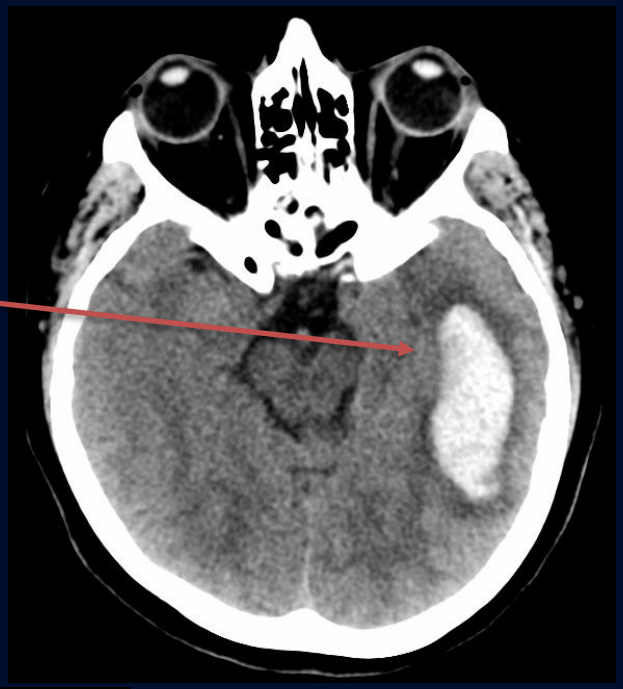


Acute parenchymal hematoma



Subarachnoid blood products

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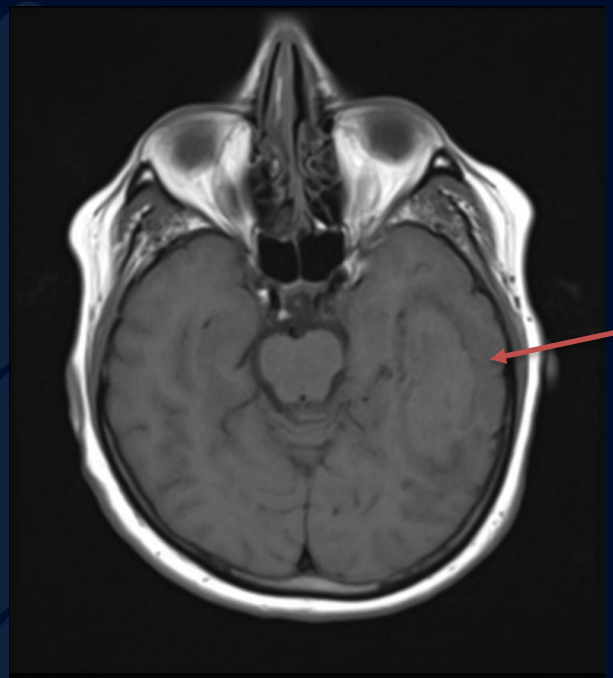
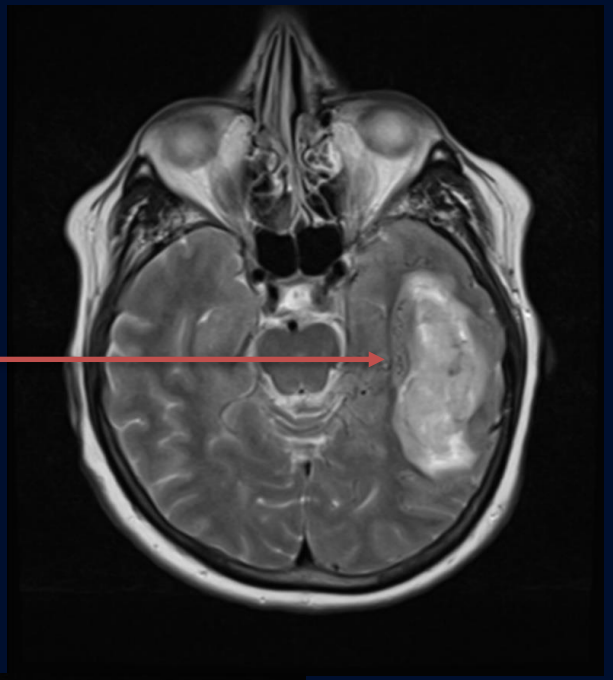
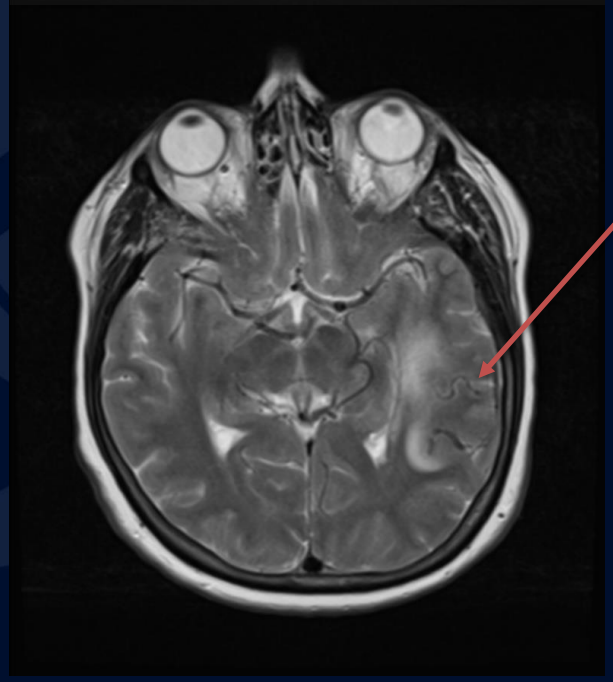


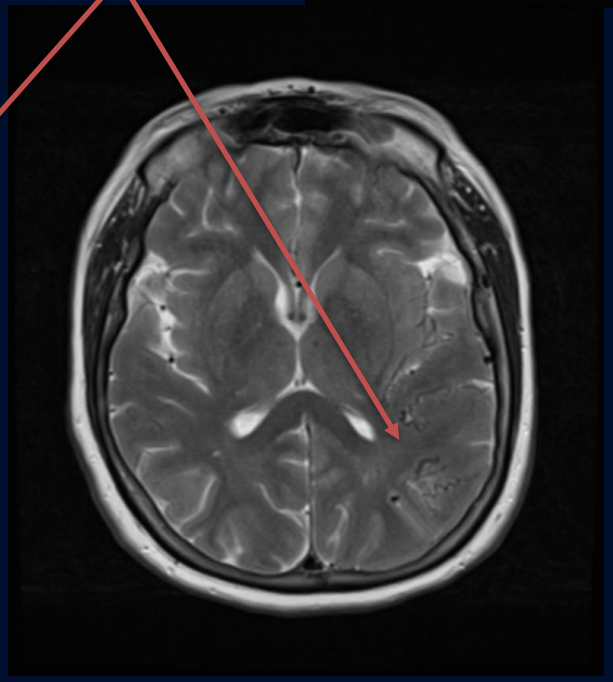
Hyperacute Blood Products

T1: isointense
T2: iso to hyper-intense



Abnormal Flow Voids





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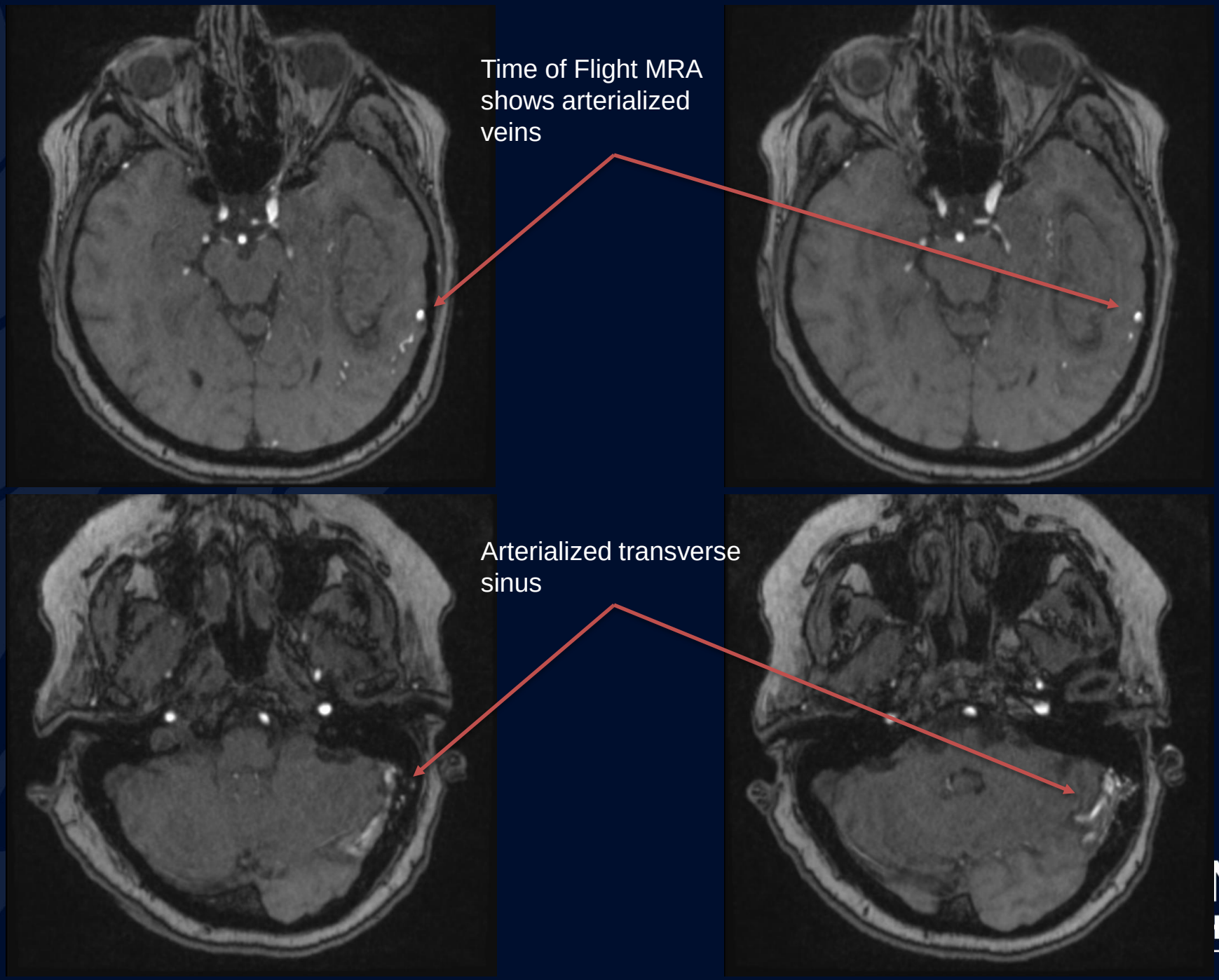
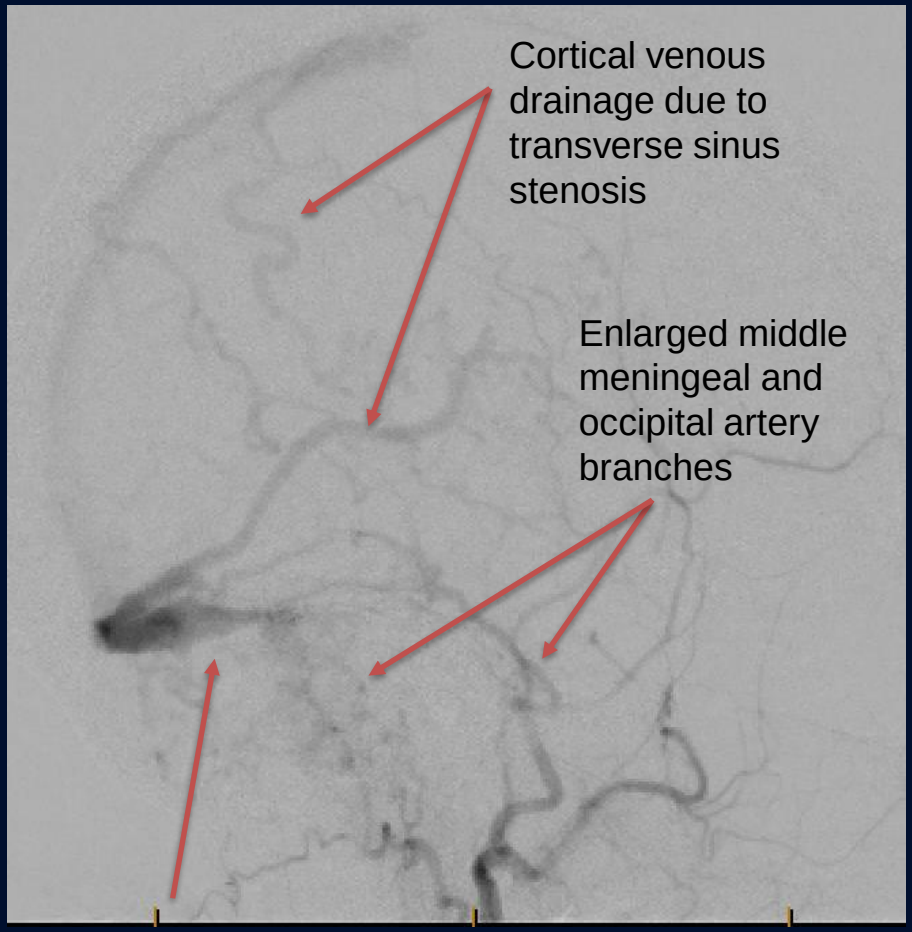

Time of Flight MRA shows arterialized veins
Arterialized transverse sinus

Left external carotid artery angiogram



Arteriovenous shunting into transverse sinus

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Dural Arteriovenous Fistula

- Dural AVFs are acquired, pathological connections between dura supplying arteries and a dural venous sinus or cortical vein. Arteriovenous shunting through the fistula results in arterialized flow into the normally low pressure venous system, which may lead to hemorrhage.
- Usually seen in adults, middle age or older. Rare in children.
- Common symptoms for transverse sinus dAVF include:
  - Hemorrhage, including subarachnoid, subdural, or parenchymal
  - Pulsatile Tinnitus
  - Neurological deficits from venous hypertension
    - Focal deficit, seizures, encephalopathy, progressive dementia

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Dural Arteriovenous Fistula

- MR imaging findings include:
  - T2/FLAIR: Enlarged flow voids; vasogenic edema
  - GRE: Microhemorrhages within brain parenchyma
  - Post contrast T1: dilated leptomeningeal and medullary vessels, venous ectasia, and parenchymal enhancement. Dural sinus occlusion or stenosis may also be seen.
  - MRA: Enlarged dural arteries; arterialized flow related signal in dural sinuses and cortical veins

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Dural Arteriovenous Fistula

- Catheter-based cerebral angiography
  - Assess arterial supply (full 6-vessel study)
    - Predominantly ECA branches (MMA, ascending pharyngeal, occipital)
    - May also be supplied by meningeal branches from ICA, vertebral, PCA and SCA
  - Assess venous drainage pathway and flow direction
    - Which sinuses are involved
    - Anterograde or retrograde flow
    - Stenotic? Occluded?
  - Identify cortical venous drainage and ectasias

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Dural Arteriovenous Fistula

- Classification based on location of shunt (dural or direct cortical vein) and presence or absence of cortical venous drainage (CVD)
  - Low grade fistulas, no CVD (Borden type I, Cognard type I or IIa)
    - Usually benign, low risk of ICH
    - Treated only if bothersome symptoms
  - High Grade Fistulas, +CVD (Borden type II and III, Cognard type IIb, III, IV, V)
    - Higher risk of ICH, usually treated

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References

- Ollenschleger M. Acute left temporal lobe ICH secondary to dural arteriovenous fistula. Radiology Online (2021)
- Reynolds MR, Lanzino G, Zipfel GJ. Intracranial Dural Arteriovenous Fistulae Stroke. 2017;48(5):1424-1431

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