66 year-old female presenting with altered mental status

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Axial CT head
(noncontrast)

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Axial CT head
(noncontrast)

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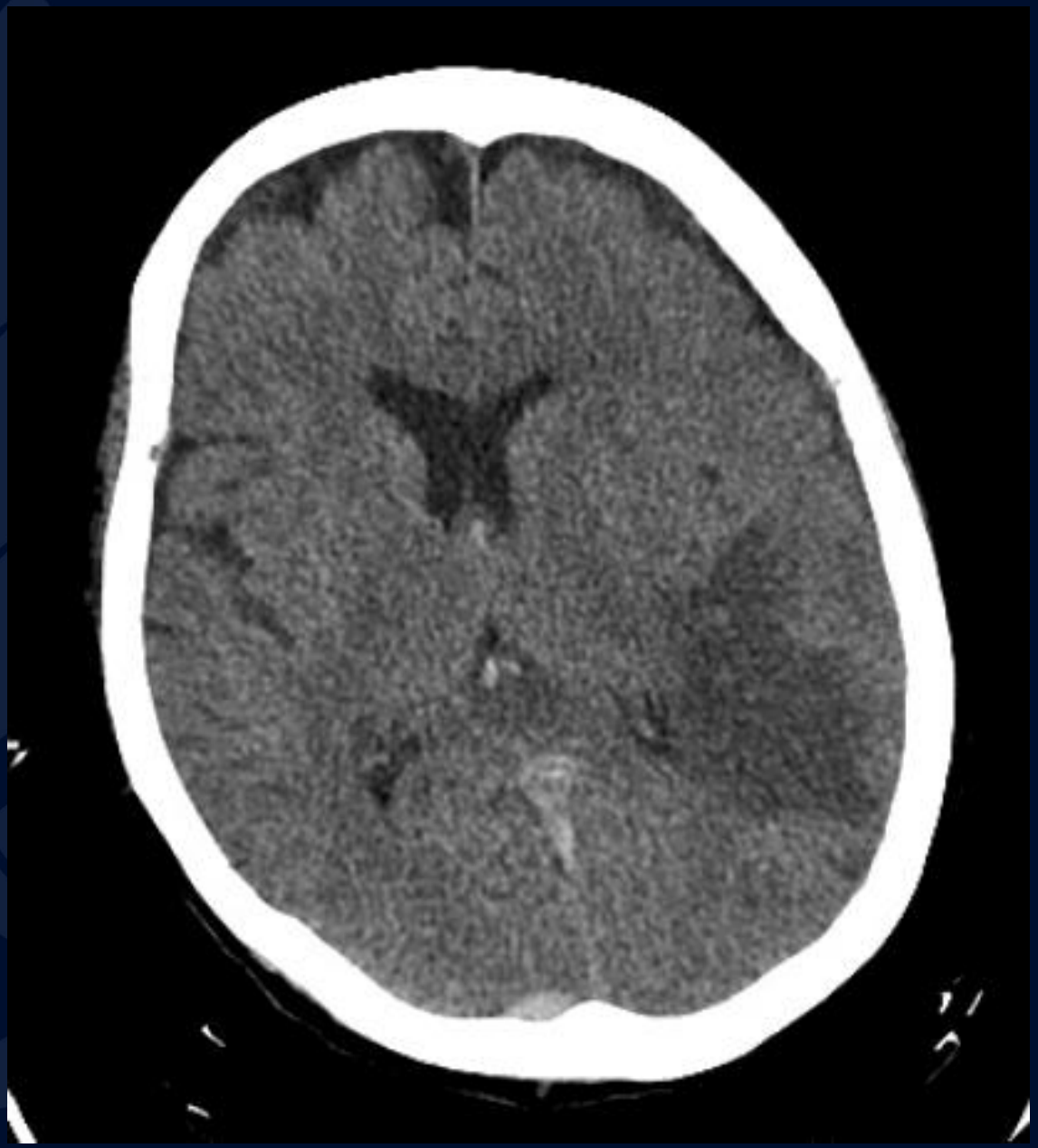

Axial CT head
(noncontrast)

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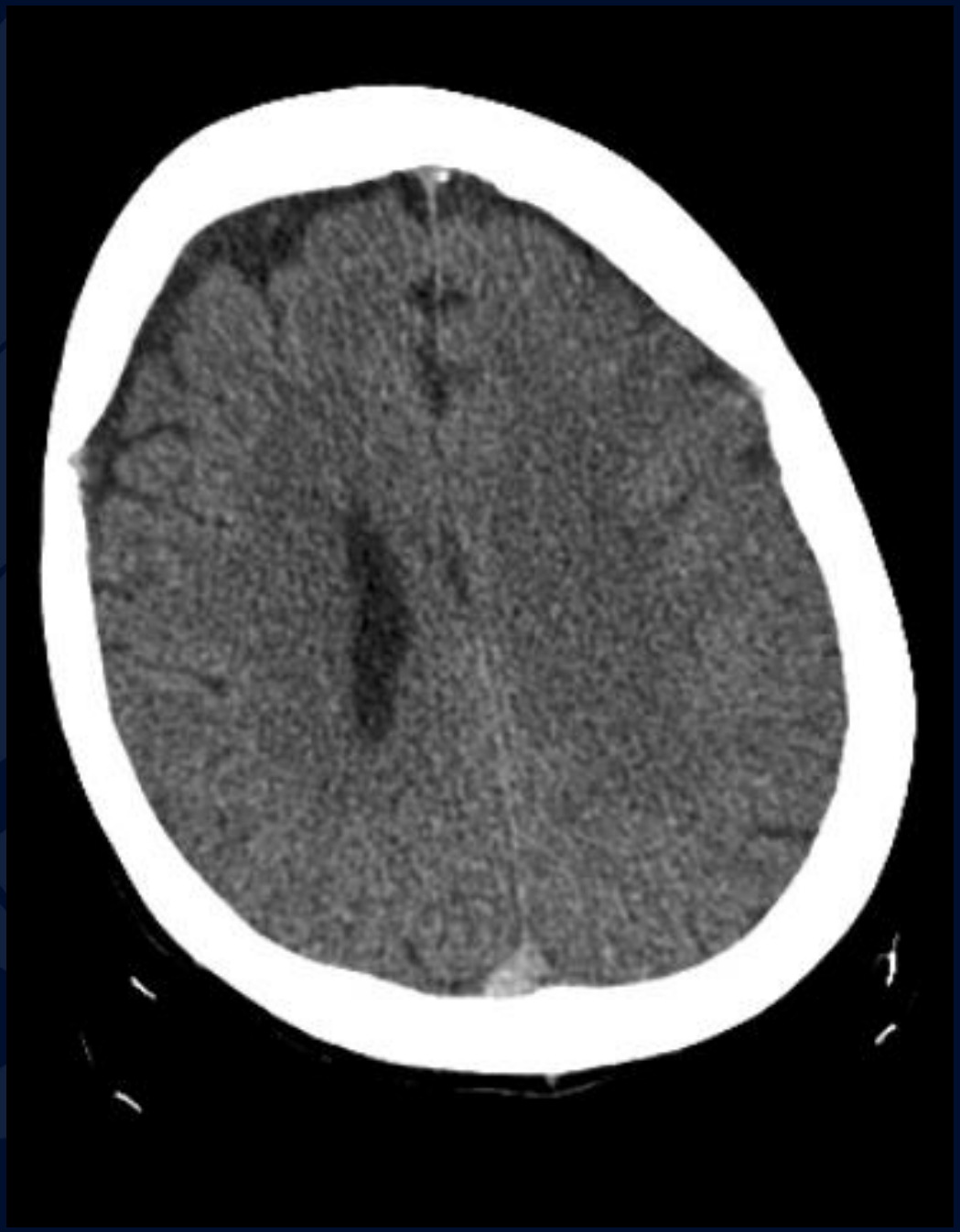

Axial CT head
(noncontrast)

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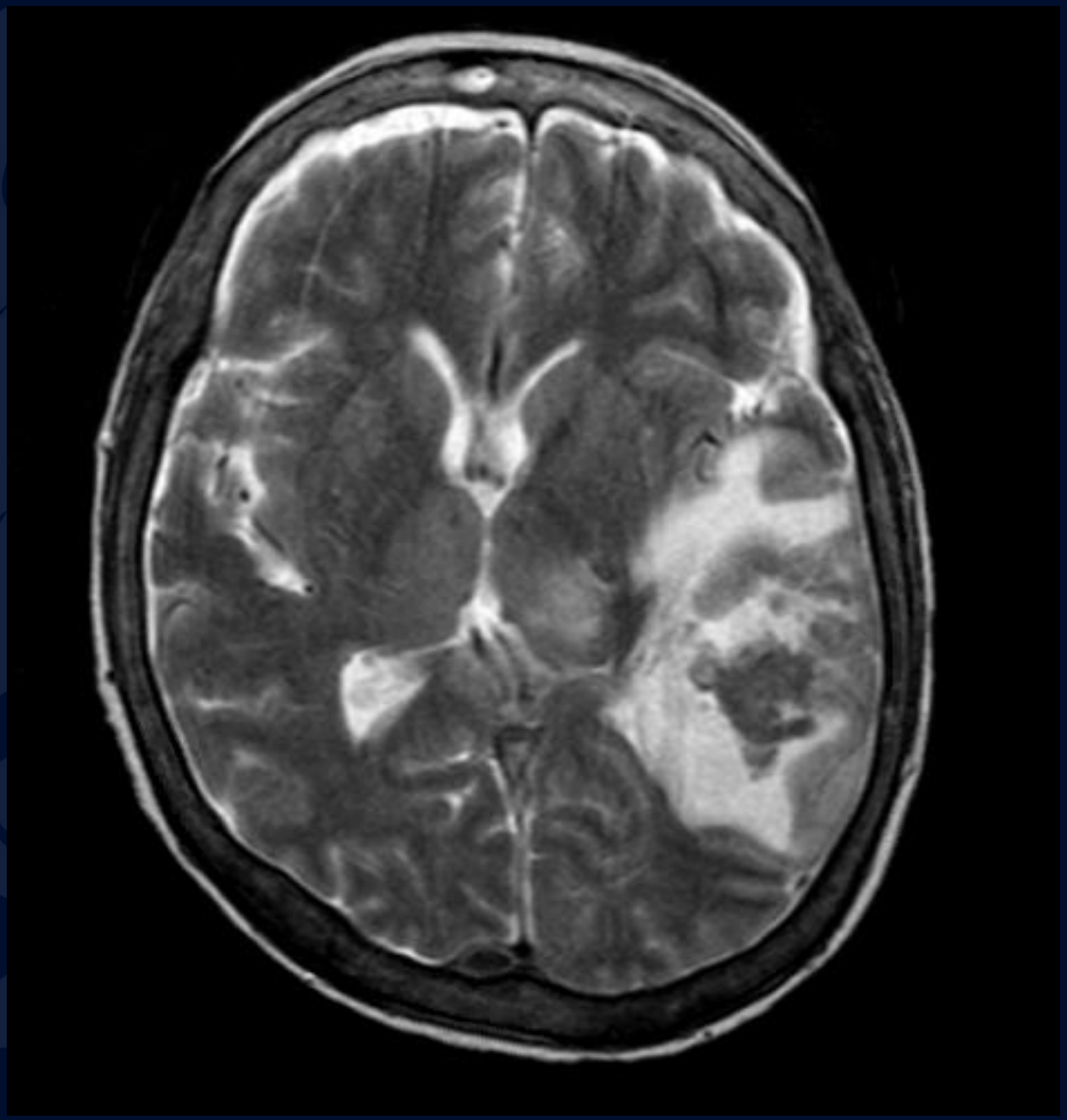

Axial slice T2 weighted MRI

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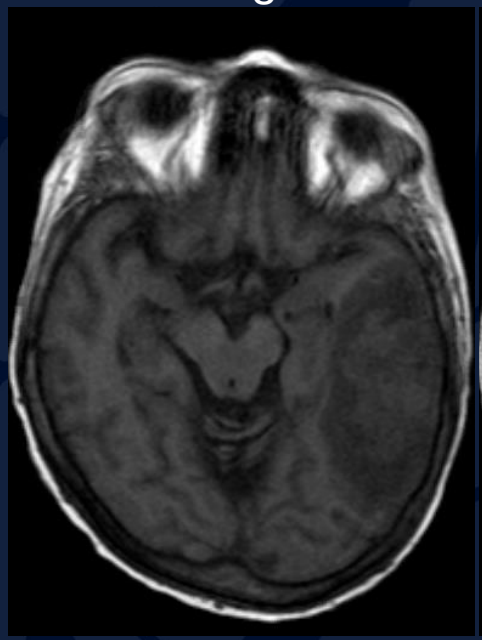
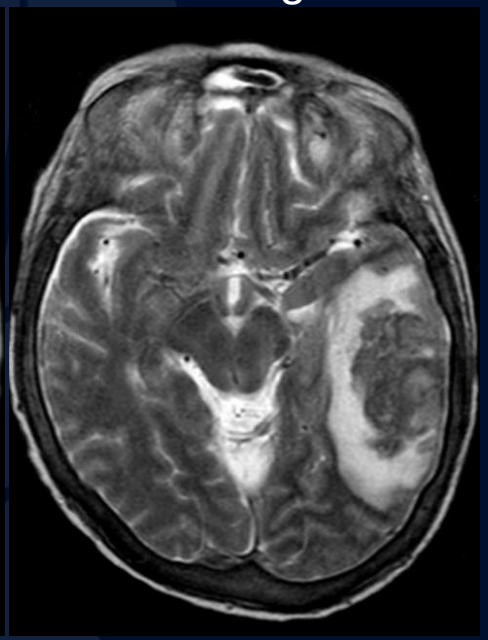
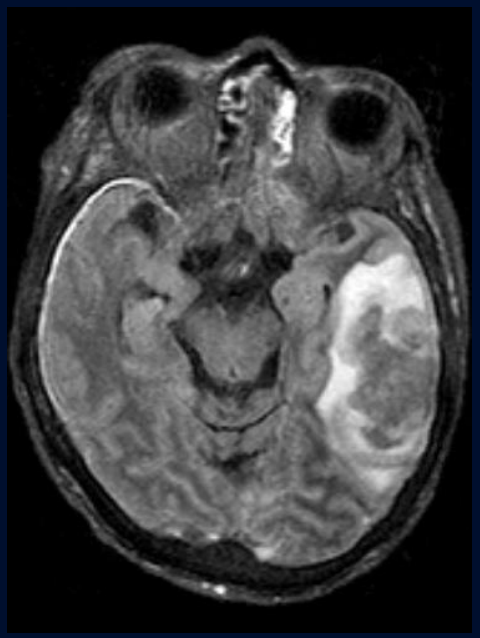
T1 weighted



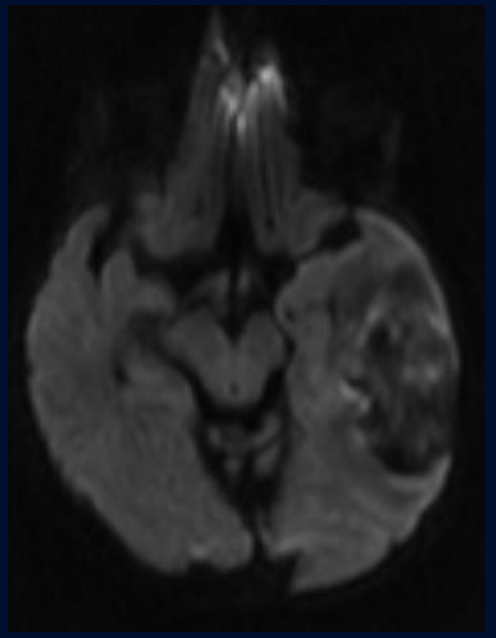
T2 weighted



FLAIR



DWI



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Dural venous sinus thrombosis (cerebral venous thrombosis) complicated by cerebral hemorrhage

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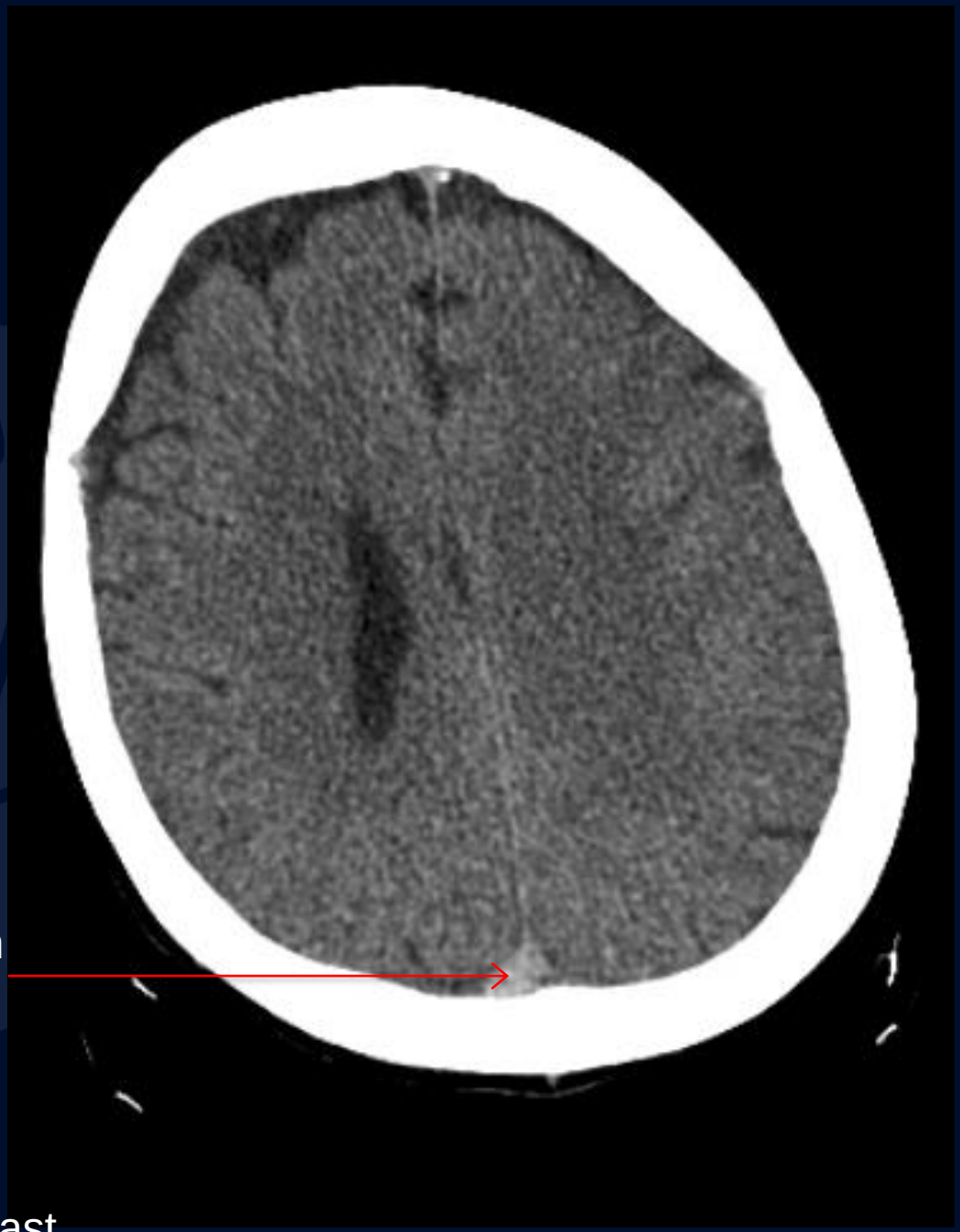

Dense vessel sign (visualization of thrombosis)

CT head noncontrast

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Dense vessel sign

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Cord sign (cord-like hyperdensity within dural venous sinus due to thrombosis)

CT head without contrast

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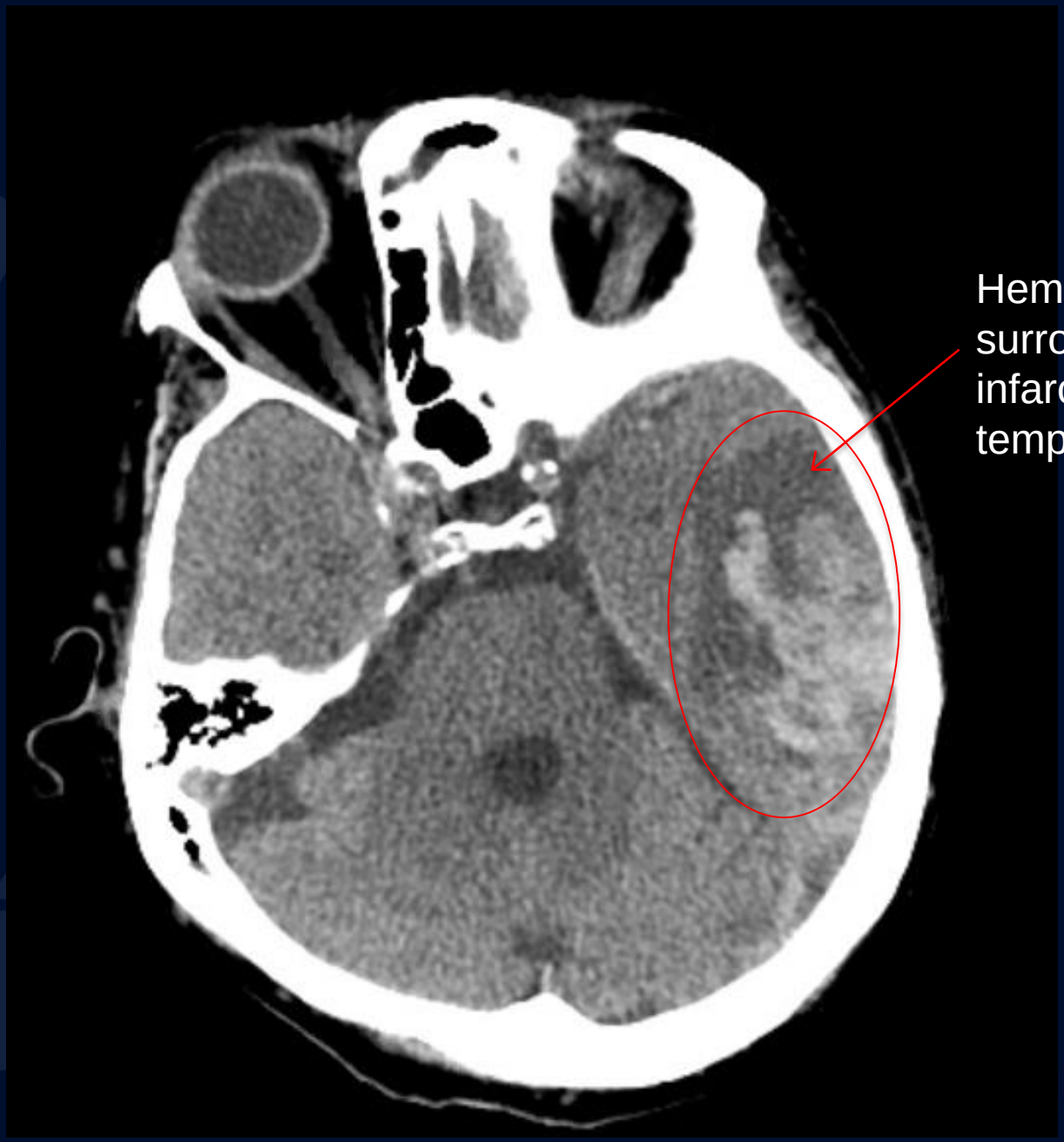

Hemorrhage with surrounding infarct/edema in left temporoparietal lobe

CT head without contrast

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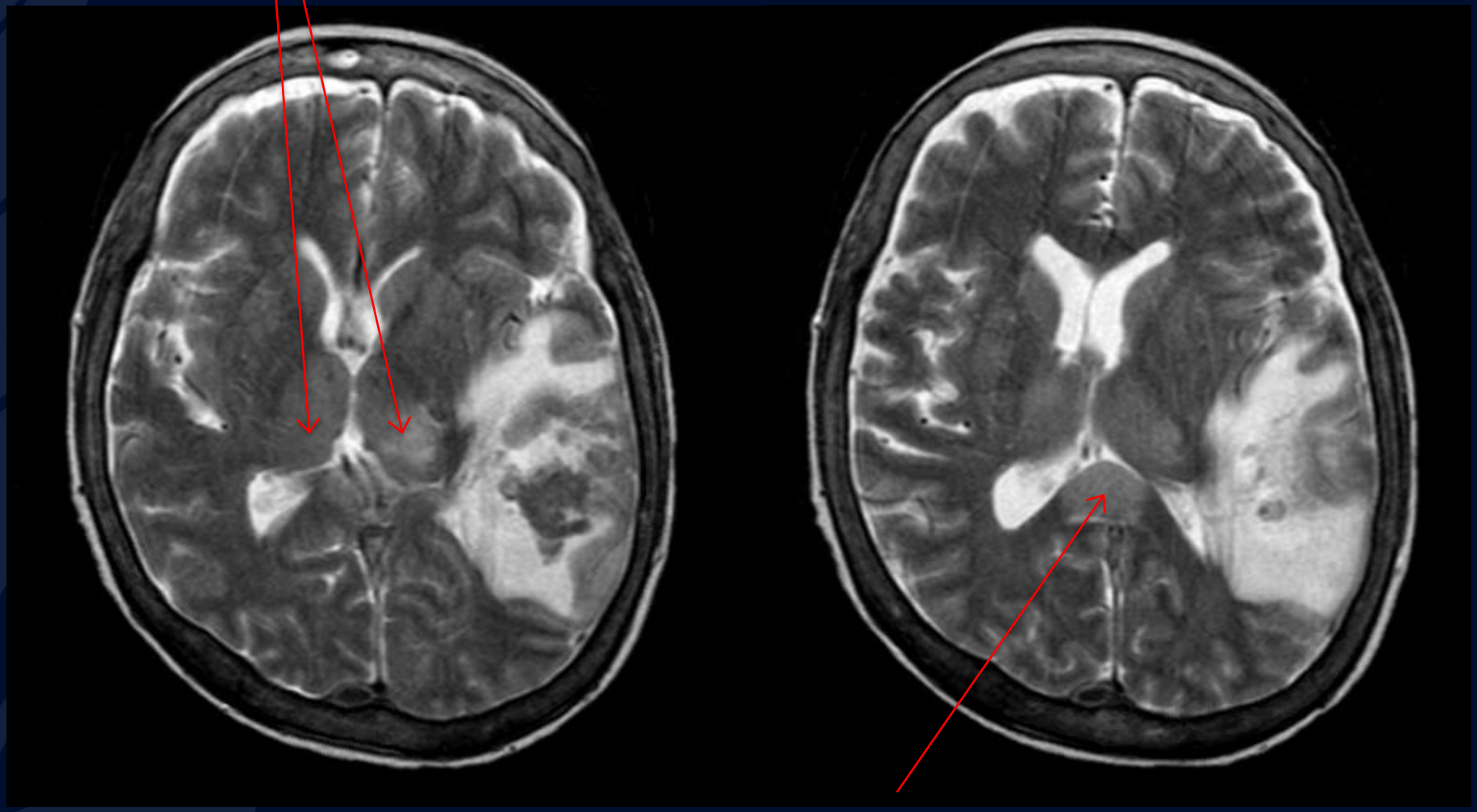
Venous congestion related edema in thalamus bilaterally



Venous congestion related edema in splenium of corpus callosum

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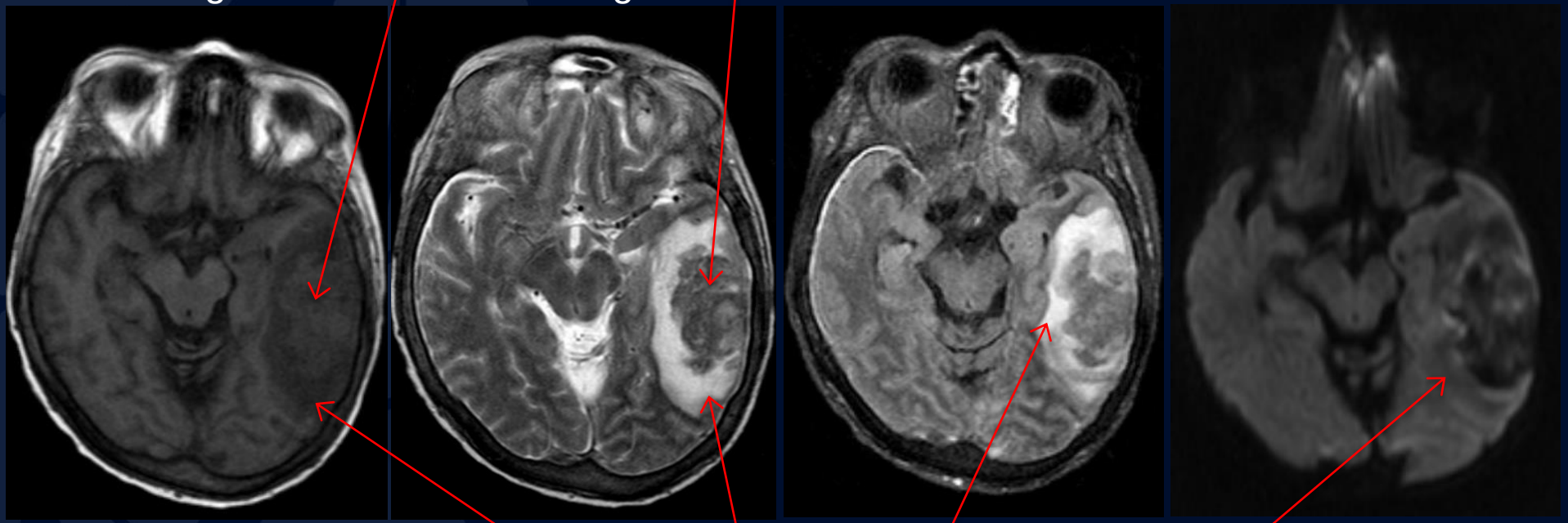
Hemorrhage in posterior left temporal lobe
- Acute hematoma: Isointense on T1, hypointense on T2



Vasogenic edema: Hyperintense on T2 and FLAIR, hypointense on T1, hypointense on DWI (unrestricted diffusion)

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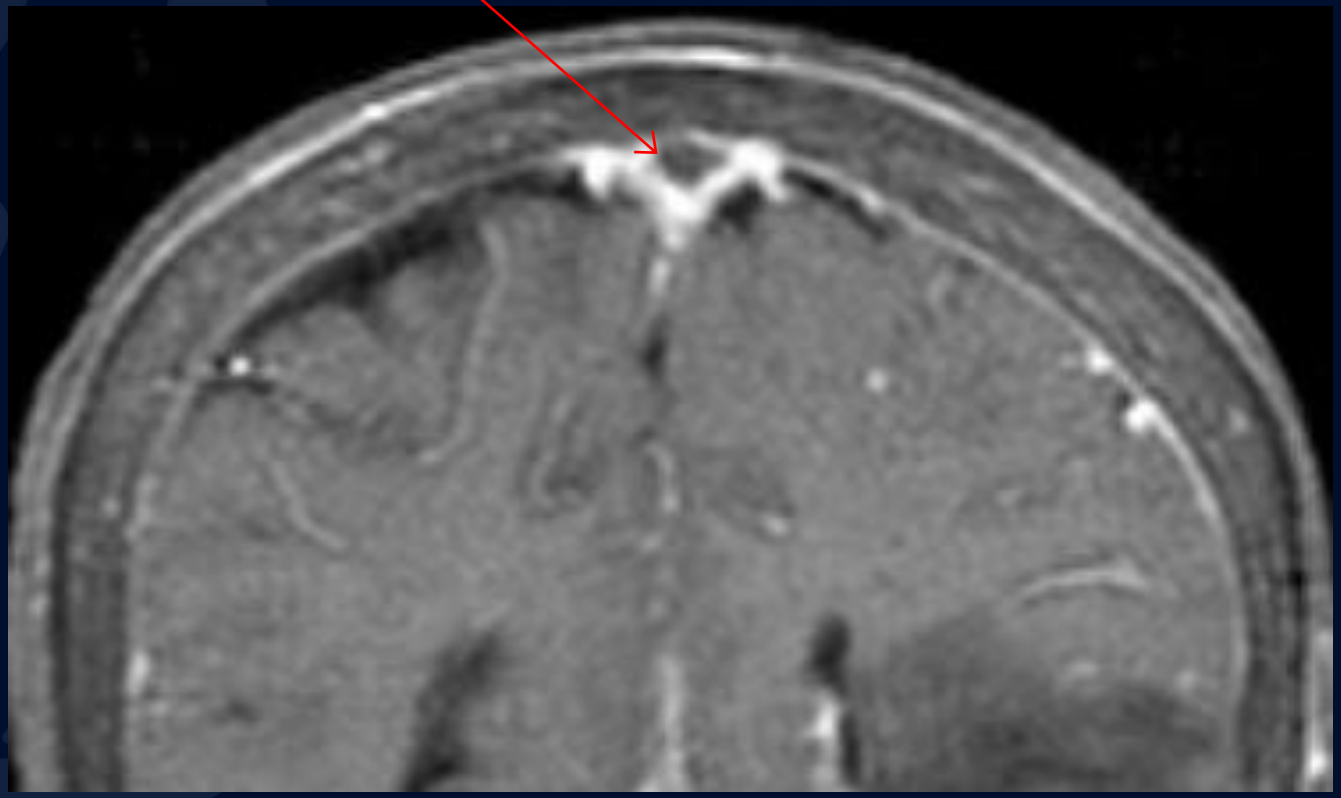
Thrombosis of superior sagittal sinus presenting as a filling defect highlighted by gadolinium



T1 weighted MRI of brain

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Cerebral venous thrombosis (CVT)

Epidemiology

- Typically occurs in patients < 50 years old
- More common in females than males (3:1 ratio)
- Accounts for 0.5%-1% of all strokes; incidence of approximately 3-5 cases per 1 million people per year

Etiology and risk factors

- Prothrombic state: Genetic and/or acquired conditions that affect either stasis of blood, endothelial dysfunction and/or injury, or hypercoagulable state (Virchow triad)
- High-risk thrombophilias (e.g. antithrombin III, protein C and S deficiency, homozygosity for factor V Leiden or prothrombin G20210A mutations)
- Oral contraceptive use
- Pregnancy
- Malignancy
- Infection
- Trauma

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Cerebral venous thrombosis (CVT)

Complications:

- Intracranial hemorrhage (in up to 40% of cases)
- Neurologic worsening after diagnosis, e.g. new focal deficit or seizure (in up to 23%)
- Mortality (3-15%)

Presentation:

- Clinical presentation is highly variable depending on location and extent of thrombosis
- Possible symptoms include: headache, diplopia, visual impairment (with papilledema), sixth nerve palsy, reduced level of consciousness, hemiparesis, motor weakness, aphasia, sensory deficit, encephalopathy, seizures, somnolence
- Most common presentation is motor weakness, including hemiparesis in up to 40%

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Cerebral venous thrombosis (CVT)

Diagnosis:

- Based on clinical suspicion with imaging confirmation
- If hypercoagulable state, clinical suspicion increases
- CT head or MRI brain useful for initial evaluation, but CVT is not ruled out if normal
- If CT or MRI negative and CVT is still suspected, or if need to further define extent of thrombosis, perform CT venography or MR venography

Management

- Initial anticoagulation with unfractionated heparin or LMWH, followed by vitamin K antagonist (regardless of presence of intracerebral hemorrhage)
- If infected CVT, antibiotics and surgical drainage
- If seizures and parenchymal lesions present, initiate antiepileptic drugs for defined duration
- Consider endovascular intervention if deterioration occurs despite intensive anticoagulation treatment

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References

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3. Leach, J. L., et al. Partially Recanalized Chronic Dural Sinus Thrombosis: Findings on MR Imaging, Time-of-Flight MR Venography, and Contrast-Enhanced MR Venography. *American Journal of Neuroradiology*. Apr 2007, 28 (4) 782-789.
4. Linn, J., et al. Diagnostic Value of Multidetector-Row CT Angiography in the Evaluation of Thrombosis of the Cerebral Venous Sinuses. *American Journal of Neuroradiology*. May 2007, 28 (5) 946-952.
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