AMSER Case of the Month September 2024

Postpartum Seizures

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Patient Presentation

- HPI: 23-year-old female now G1P1 with history of pre-eclampsia admitted for induction of labor who had an unwitnessed seizure lasting 2 minutes after spontaneous vaginal delivery.
  - Initial BP 184/116 → 135/91 within 4 minutes after Mg bolus
  - Four hours later, experienced witnessed tonic-clonic seizure lasting 4 minutes
  - BP measured at 161/105 after 2nd seizure
- PE: Positive for fatigue and bilateral lower extremity pitting edema
- Pertinent labs: WBC 26, lactate 11.4, procalcitonin 1.14, CRP 4.9

What Imaging Should We Order?

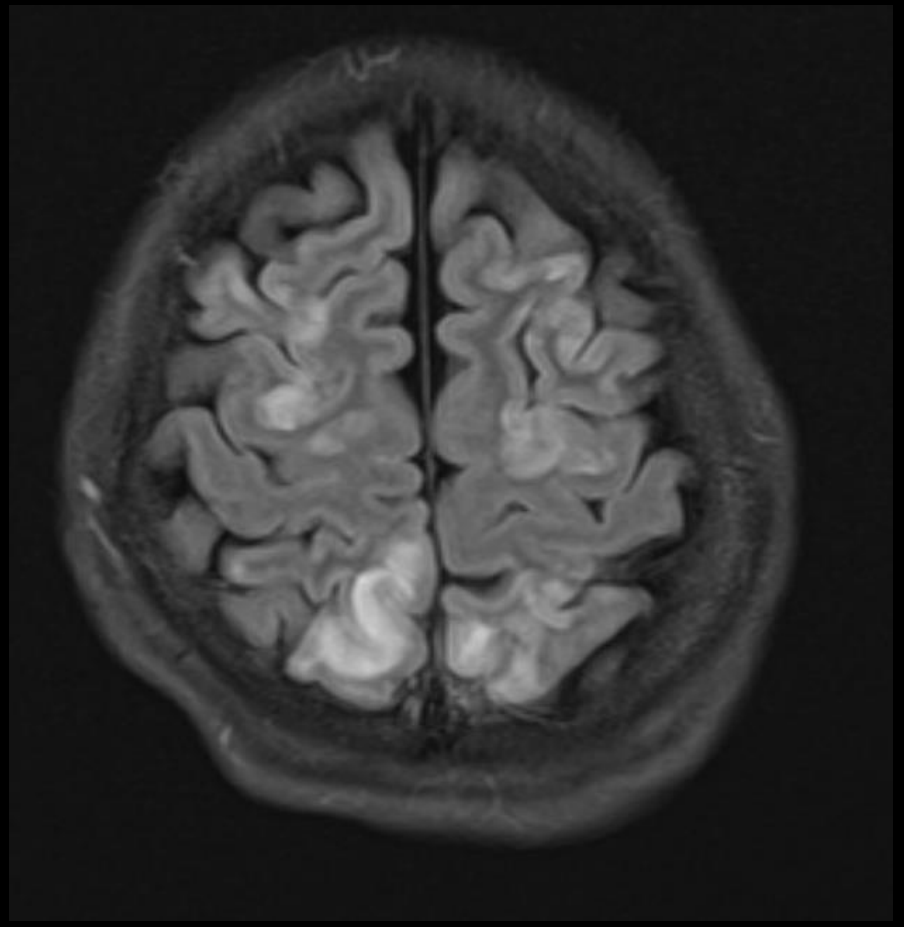
ACR Appropriateness Criteria

Variant 1: **New-onset seizure. Unrelated to trauma. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
CT head without IV contrast	Usually Appropriate	☢☢☢
MRI head without IV contrast	Usually Appropriate	O
MRI head without and with IV contrast	May Be Appropriate	O
CT head with IV contrast	Usually Not Appropriate	☢☢☢
CT head without and with IV contrast	Usually Not Appropriate	☢☢☢
FDG-PET/CT brain	Usually Not Appropriate	☢☢☢
MEG	Usually Not Appropriate	O
MRI functional (fMRI) head without IV contrast	Usually Not Appropriate	O
HMPAO SPECT or SPECT/CT brain ictal and interictal	Usually Not Appropriate	☢☢☢

This imaging modality was ordered by the physician

Findings: (unlabeled)



T2 FLAIR

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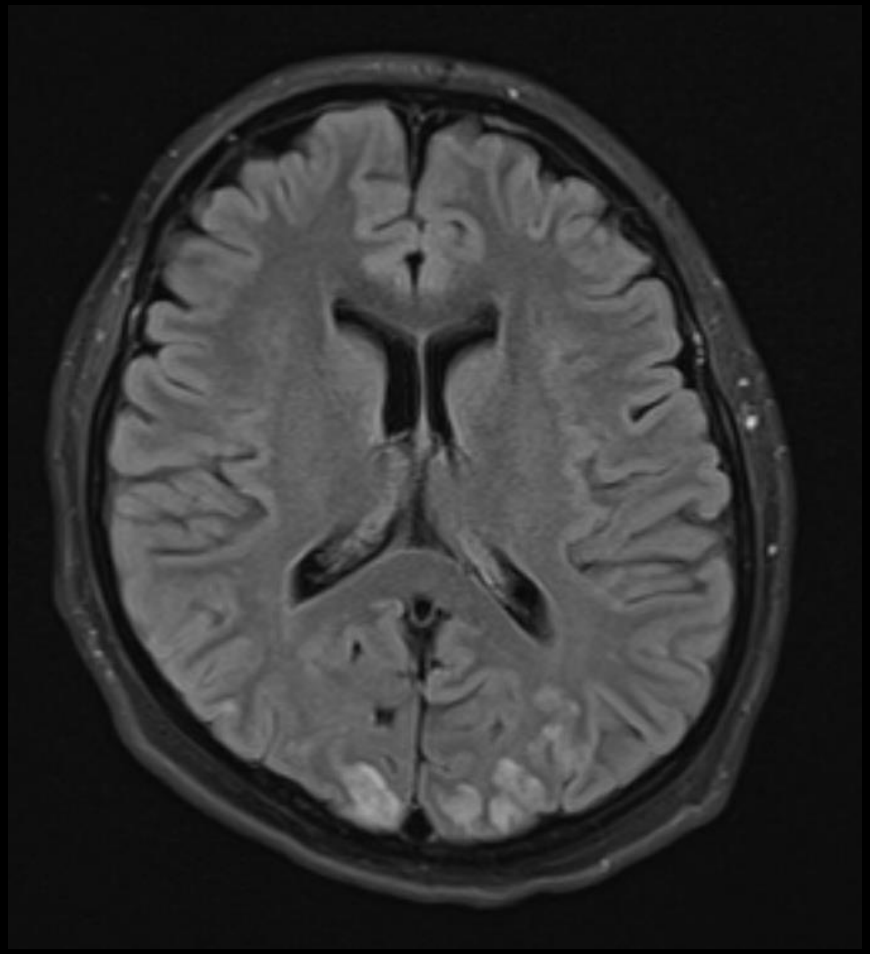
Findings: (unlabeled)



T2 FLAIR

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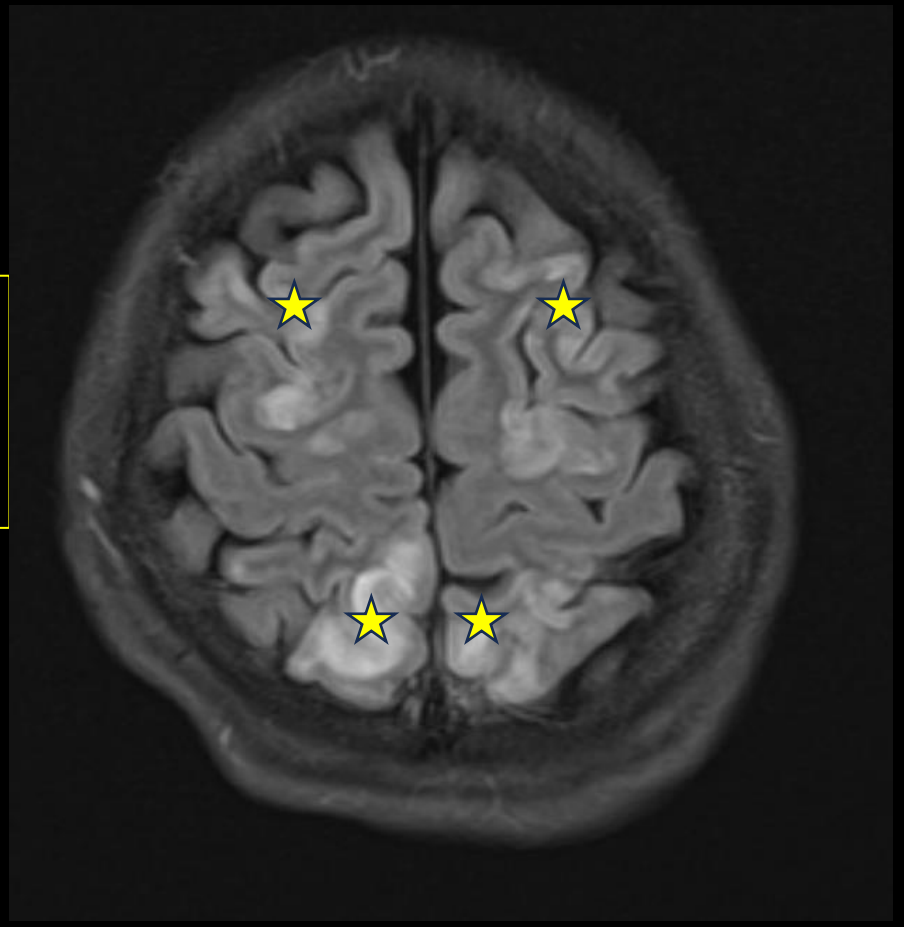
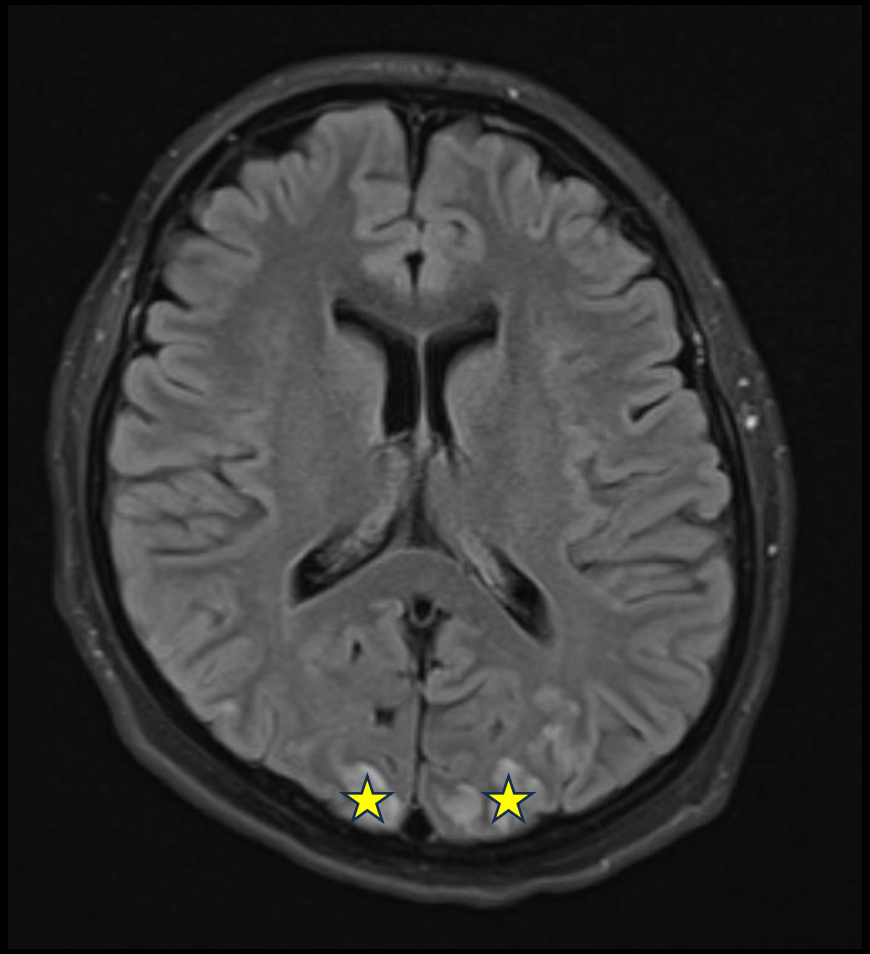
Findings: (labeled)

Hyperintensity involving the bilateral parietal and frontal lobes.



T2 FLAIR

Findings: (labeled)



T2 FLAIR

Hyperintensity involving the bilateral paramedian occipital lobes

Final Dx:

Posterior Reversible Encephalopathy Syndrome (PRES)

Posterior Reversible Encephalopathy Syndrome

- Definition: Neurological disorder characterized by encephalopathy with radiological findings of brain edema generally occurring in posterior parietal or occipital cerebrum
- Note: Despite its name, the disease can extend beyond the posterior cerebrum and cause irreversible cerebral injury
  - May also lack signs of encephalopathy
- Epidemiology:
  - Females > males
    - Due to association with pregnancy and autoimmune diseases
  - Between ages 20-60 years old

Posterior Reversible Encephalopathy Syndrome

- Etiology:
  - Hypertension is most common, particularly postpartum, eclampsia, or kidney disease
  - Other causes:
    - Medication effects e.g., cyclophosphamide or tacrolimus
    - Infection/Sepsis
- Pathogenesis:
  - Theory 1: Vasogenic
    - Hypertension overwhelms autoregulatory response, leading to cerebral hyperperfusion, blood-brain barrier dysfunction, and vasogenic edema
  - Theory 2: Endothelial dysfunction
    - Secondary to circulating endogenous or exogenous toxins
    - Endothelial dysfunction leads to vasoconstriction of microvasculature, causing cerebral hypoperfusion and vasogenic edema

Posterior Reversible Encephalopathy Syndrome

- Clinical features:
  - Headache
  - Seizures
  - Altered mental status or confusion
  - Visual disturbance
  - Other focal neurological deficits e.g., ataxia, tinnitus, and vertigo
- Diagnosis:
  - Requires BOTH clinical and radiologic findings
  - Imaging typically reveals symmetric hyperintensities on T2-weighted and FLAIR sequences in the posterior white matter, though other brain regions can be involved
- Management:
  - Supportive care, discontinuation of offending medications, blood pressure management, and antiseizure medications if needed

Case Discussion

- Shortly after her second seizure, she was started on a 24-hour magnesium infusion.
- Remained in post-ictal state for several hours and returned to her baseline mental status without neurological deficits.
- Neurology initiated antihypertensives for aggressive BP management and Keppra with repeat MRI in 1-2 months

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