

AMSER Case of the Month

September 2026

43-year-old male with persistent altered mental status
following status asthmaticus

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Patient Presentation

- 43-year-old male with a history of poorly controlled asthma who presented with life-threatening status asthmaticus requiring intubation and paralysis
- Hospital course was complicated by acute tubular necrosis due to rhabdomyolysis
- Following extubation and weaning of sedation, the patient remained encephalopathic, prompting a neurologic workup

Pertinent Clinical Findings

- **Physical Exam**

- Not oriented to name, time, or place

- **Vital Signs**

- Blood pressure >200/120

- **Laboratory Values**

- Blood urea nitrogen (BUN) > 200 mg/dL
- Creatinine > 10 mg/dL
- Creatine kinase (CK) > 18,000 U/L

What Imaging Should We Order?

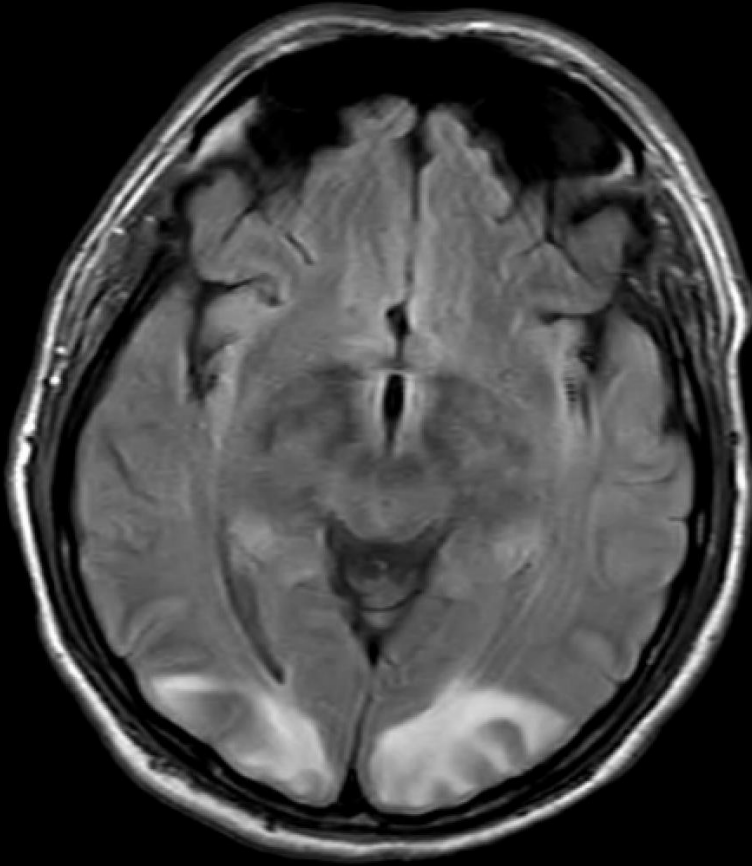
Select the applicable ACR Appropriateness Criteria

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Altered mental status, toxic-metabolic cause suspected, initial imaging	3149733	● MRI head without IV contrast	0 mSv O	0 mSv [ped] O	May be appropriate (Disagreement)
		● CT head without IV contrast	1-10 mSv ☼☼☼	0.3-3 mSv [ped] ☼☼☼	May be appropriate (Disagreement)
		● MRI head with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● MRI head without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● CT head with IV contrast	1-10 mSv ☼☼☼	0.3-3 mSv [ped] ☼☼☼	Usually not appropriate
		● CT head without and with IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	Usually not appropriate

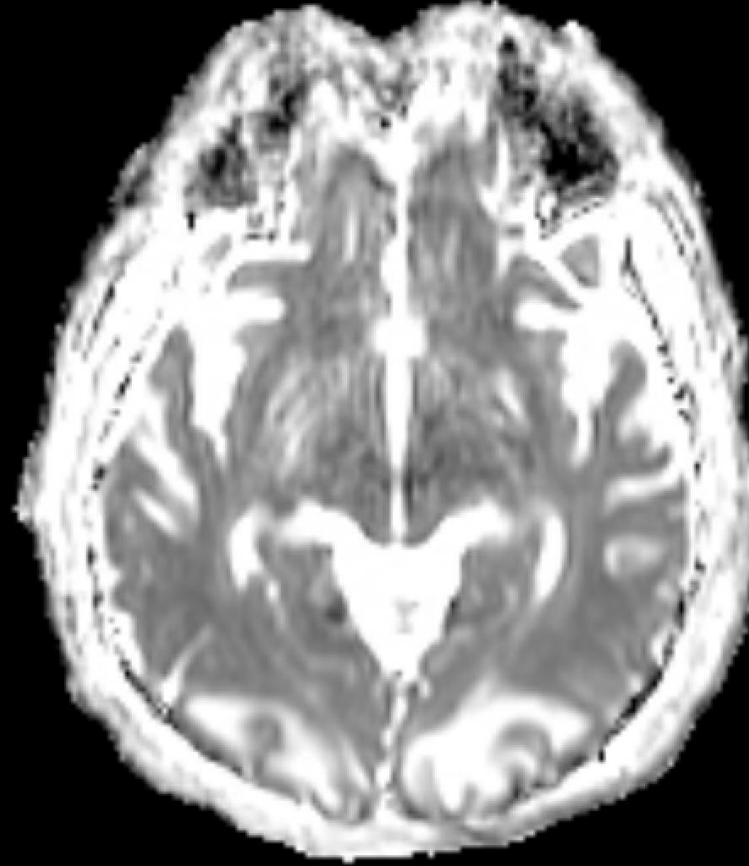
This imaging modality was ordered by the Medical ICU team

Findings (unlabeled) – MRI Brain without Contrast

T2 FLAIR

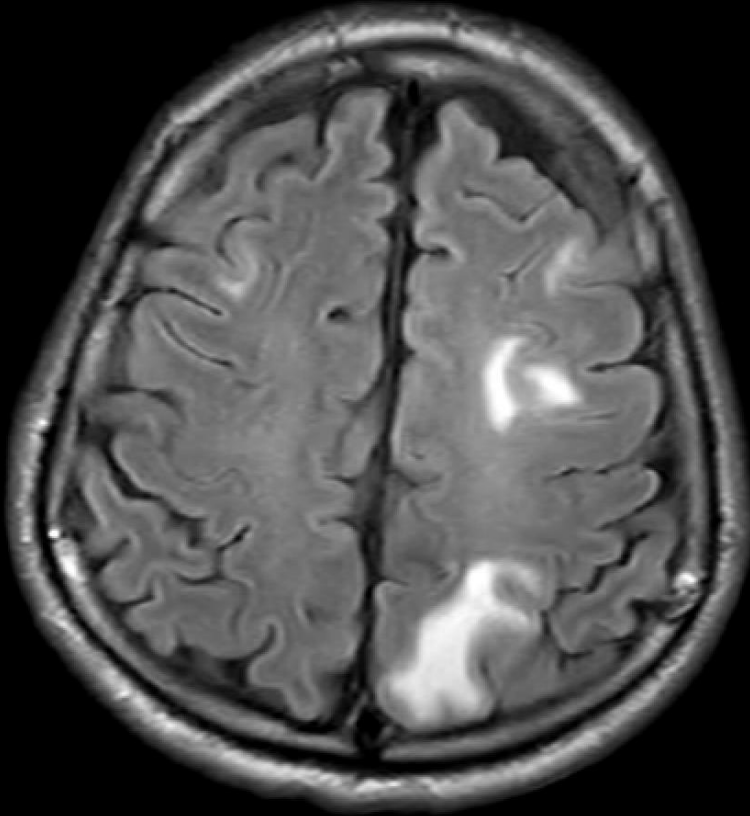


ADC Map

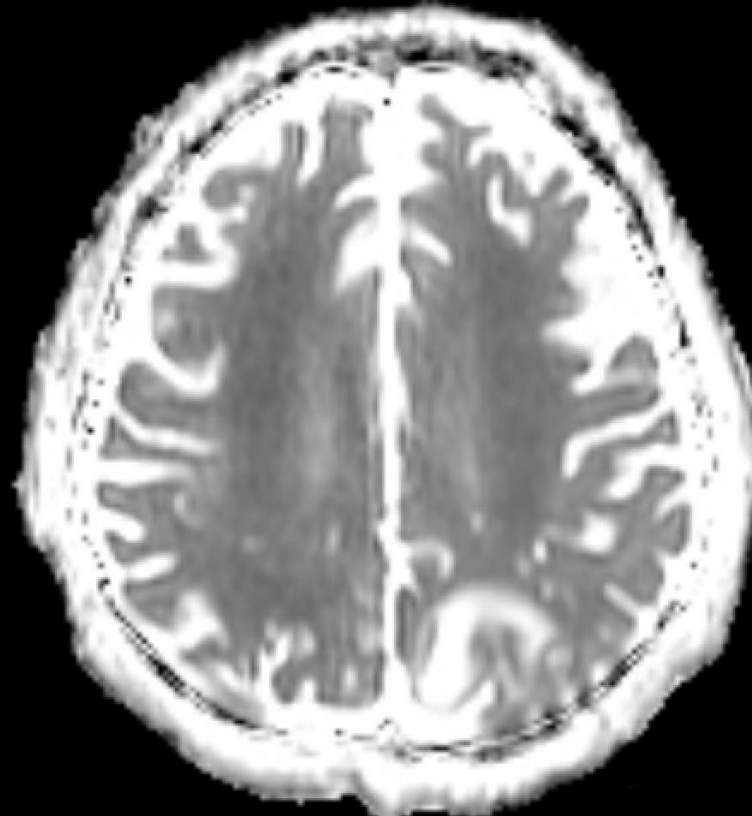


Findings (unlabeled) – MRI Brain without Contrast

T2 FLAIR

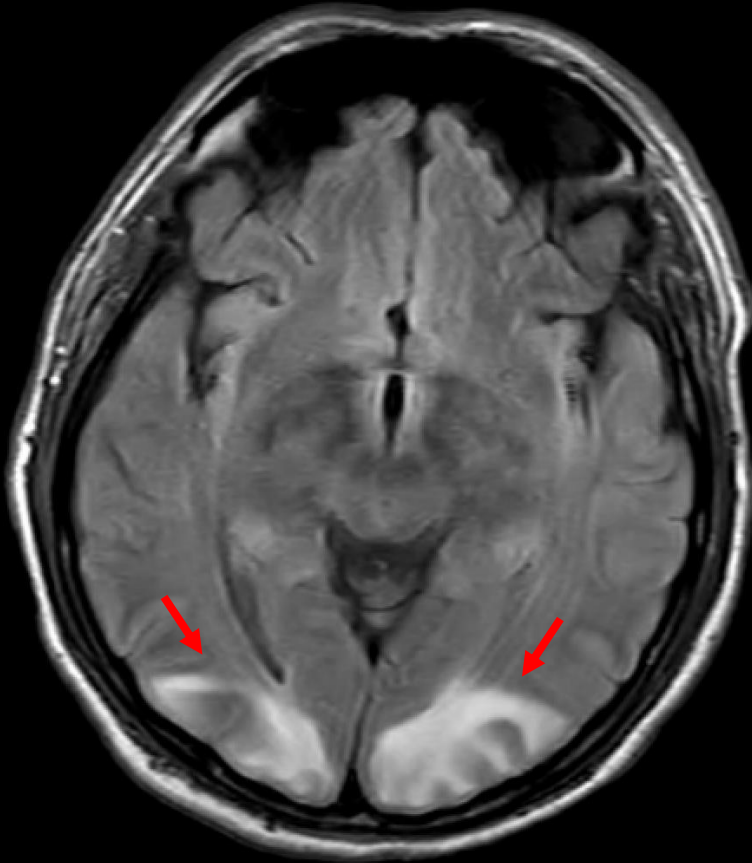


ADC Map

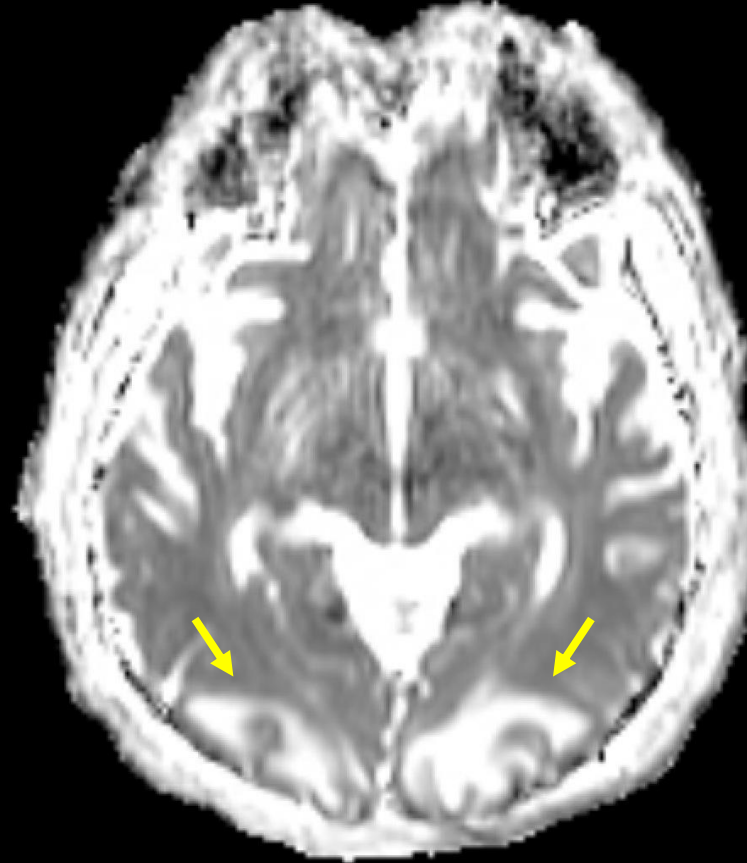


Findings (labeled) – MRI Brain without Contrast

T2 FLAIR

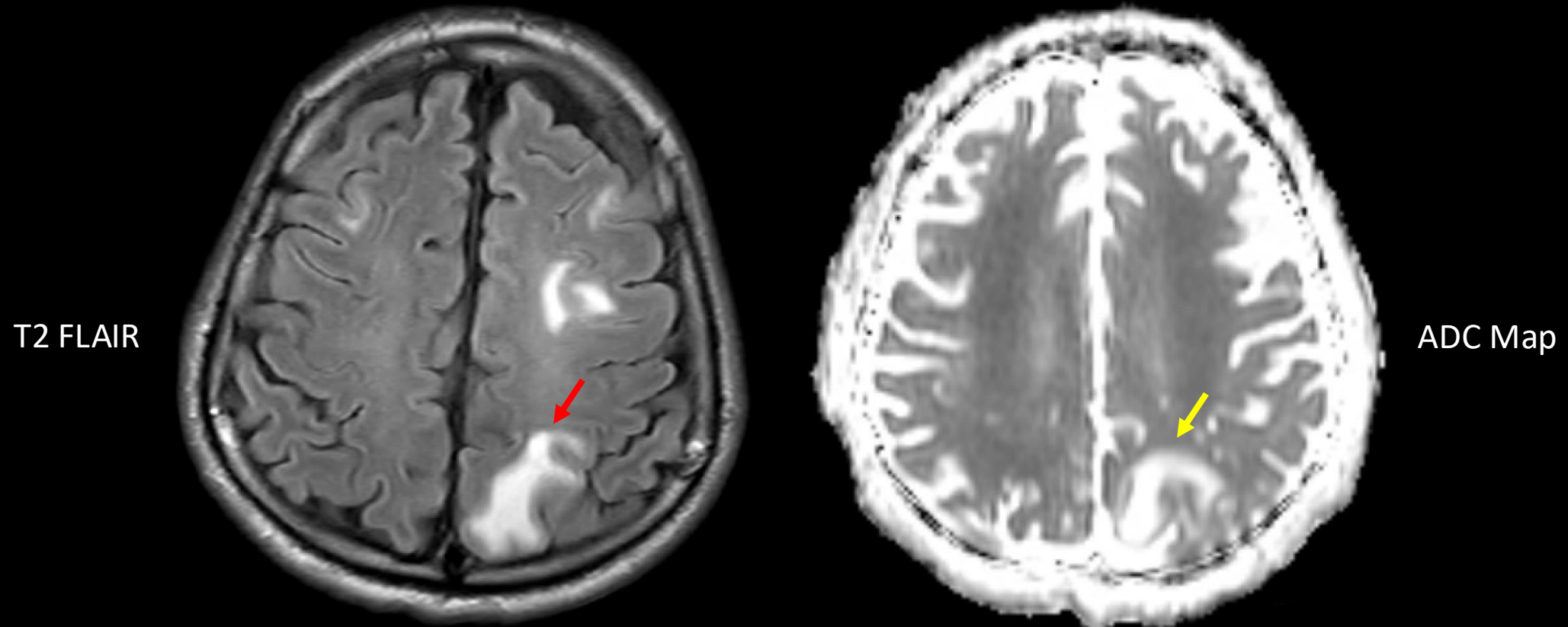


ADC Map



T2 FLAIR hyperintensity in the bilateral occipital lobes (red arrows) with corresponding increased diffusion on ADC (yellow arrows), consistent with vasogenic edema

Findings (labeled) – MRI Brain without Contrast



T2 FLAIR hyperintensity in the left parietal lobe (red arrow) with corresponding increased diffusion on ADC (yellow arrow), consistent with vasogenic edema

Final Dx:

Posterior Reversible Encephalopathy Syndrome (PRES)

Case Discussion

Definition

- PRES is a clinico-radiologic syndrome characterized by altered consciousness and vasogenic edema predominantly involving the parieto-occipital white matter¹

Pathophysiology

- Failure of cerebral autoregulation and endothelial dysfunction are hypothesized to result in breakdown of the blood-brain barrier (primarily in the posterior circulation) with extracellular fluid accumulation²

Risk factors

- Hypertensive emergency¹
- Immunosuppressive or cytotoxic medications (e.g., chemotherapy)¹
- Pre-eclampsia/eclampsia¹
- Renal dysfunction²

Case Discussion

Typical MRI findings

- Symmetric bilateral parieto-occipital T2 FLAIR hyperintensity³
- Vasogenic edema with increased ADC signal³
- Cortical and subcortical white matter involvement⁴
- Usually little or no true restricted diffusion⁴

Less common MRI findings

- Asymmetric, unilateral involvement³
- Brainstem or basal ganglia involvement (“central PRES”)³
- Microhemorrhages seen on susceptibility weighted imaging (SWI)⁵

Clinical pearl

- True restricted diffusion in PRES suggests cytotoxic edema and is associated with more severe or irreversible injury⁵

Case Discussion

This patient had multiple risk factors for PRES, including:

- Severe kidney failure secondary to acute tubular necrosis and rhabdomyolysis
- Hypertensive crisis likely related to volume overload from acute kidney failure
- Immunosuppression with high-dose IV steroids for his status asthmaticus

Management of his PRES included:

- Strict blood pressure control (goal SBP < 160) using IV calcium channel blockers⁵
- Hemodialysis for his acute kidney failure and volume overload⁵
- Gradual corticosteroid taper as his respiratory status improved⁵

Clinical course:

- His mental status and kidney function returned to baseline
- Follow-up MRI was not obtained to document radiographic resolution of PRES

References:

1. Sudulagunta SR, Sodalagunta MB, Kumbhat M, Settikere Nataraju A. Posterior reversible encephalopathy syndrome(pres). *Oxford Medical Case Reports*. 2017;2017(4). doi:10.1093/omcr/omx011
2. Mourid MR, Oweidat M, Abady E, et al. Posterior reversible encephalopathy syndrome (PRES): A narrative review of pathophysiology, clinical insights, and advances in management. *International Journal of Emergency Medicine*. 2026;19(1). doi:10.1186/s12245-026-01138-9
3. Gaillard F, Sharma R, Silverstone L. Posterior reversible encephalopathy syndrome. *Radiopaedia.org*. Published online May 2, 2008. doi:10.53347/rid-1915
4. Bartynski WS. Posterior reversible encephalopathy syndrome, part 1: Fundamental imaging and clinical features. *American Journal of Neuroradiology*. 2008;29(6):1036-1042. doi:10.3174/ajnr.a0928
5. Ando Y, Ono Y, Sano A, Fujita N, Ono S. Posterior reversible encephalopathy syndrome: A review of the literature. *Internal Medicine*. 2022;61(2):135-141. doi:10.2169/internalmedicine.7520-21