

AMSER Case of the Month

November 2025

HPI: 72 year old female with left facial droop

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Patient Presentation

HPI: Presenting from outside hospital for suspected intraparenchymal hemorrhage. Unable to finish MRI exam due to excessive movement.

PMHx: COPD, HTN, HLD, T2DM, hypothyroidism

Neuro exam: GCS 15, Mild left facial droop, LUE 4/5, preserved strength and sensation in other extremities

Pertinent Labs

- Urine glucose >1000 mg/dL
- A1c >14.5%
- POCT glucose was initially 350s
- Lipid panel:
 - Cholesterol: 110 mg/dL
 - Triglycerides 85mg/dL
 - HDL 53 mg/dL
 - LDL 40 mg/dL
- Drug screen negative

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Clinical Condition: Headache

Variant 3: Sudden onset of severe headache (“Worst headache of my life”, “thunderclap headache”).

Radiologic Procedure	Rating	Comments	RRL*
CT head without IV contrast	9		☼☼☼
CTA head with IV contrast	8		☼☼☼
MRA head without and with IV contrast	7		0
MRA head without IV contrast	7		0
Arteriography cervicocerebral	7		☼☼☼
MRI head without IV contrast	7	This procedure may be helpful after CT depending on CT findings. Include FLAIR and GRE or SWI in this procedure.	0
MRI head without and with IV contrast	6	Include FLAIR and GRE or SWI in this procedure. This procedure may be helpful after CT depending on CT findings.	0
CT head without and with IV contrast	5		☼☼☼
CT head with IV contrast	3		☼☼☼

This imaging modality was ordered by the ER physician

Follow up imaging when patient was transferred.

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

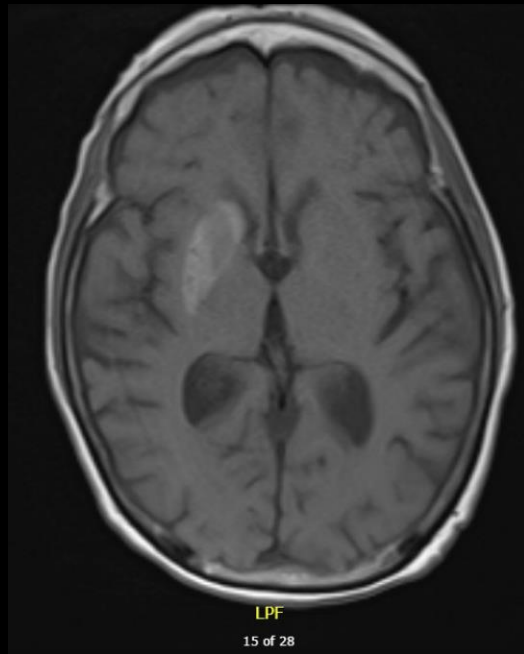
*Relative Radiation Level



Findings (unlabeled)

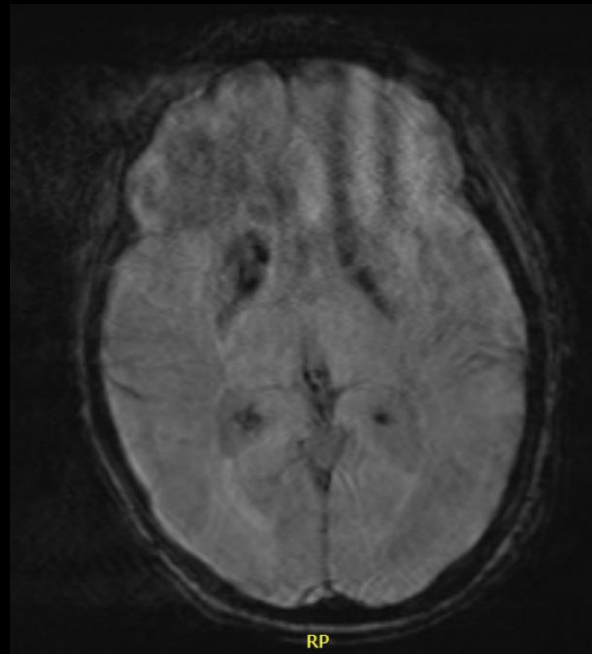


CT



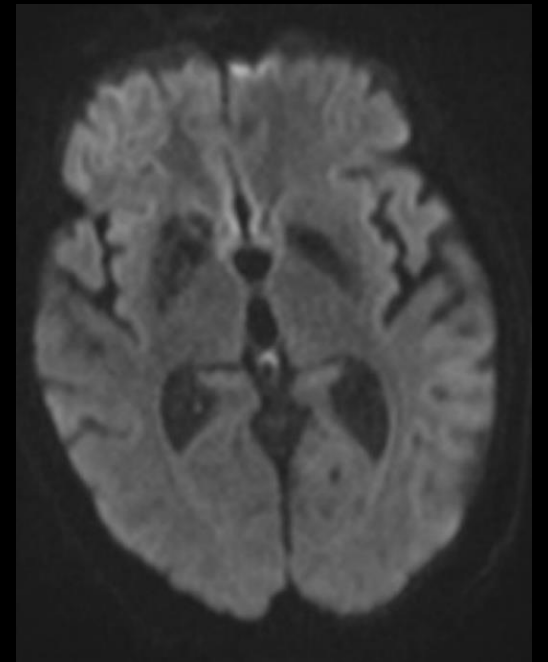
LPF
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T1



RP

SWI



DWI

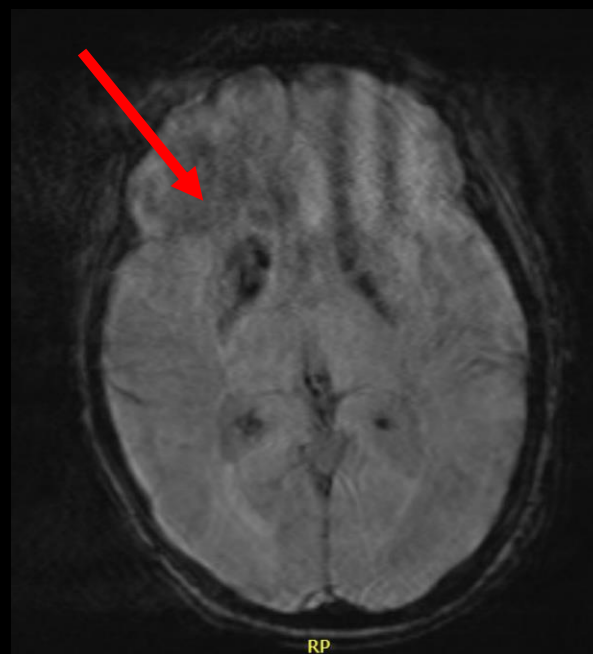
Findings (labeled)



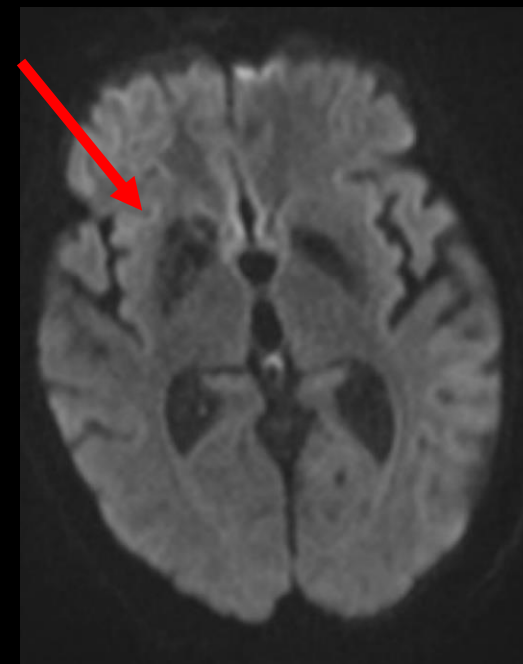
CT



T1



SWI



DWI

- Hyperdensity in the right basal ganglia on CT.
- On MR, the right basal ganglia exhibits T1 hyperintensity, susceptibility hypointensity, and no diffusion restriction.

Final Dx:

Non-Ketotic Hyperglycemic Hemichorea

Treatment and Prognosis

Normalization of blood glucose

- Long acting insulin
- Normalize BG to <200 mg/dL before discharge
- Monitoring fluids and electrolytes

Overall, patient improved rapidly with treatment and chorea ceased within 2-3 days of normalized blood glucose. Prognosis is good and most patients have no long term sequelae.

Case Discussion

- Definition: a rare manifestation of non-ketotic hyperglycemia, presenting clinically with chorea/ ballismus, which has characteristic neuroradiologic findings in the basal ganglia.
- Pathophysiology is undetermined. Potential causes proposed:
 - Astrocytosis
 - Myelin destruction
 - Mineral Deposition
 - GABA depletion
- Demographics:
 - Most patients have T2DM
 - Mean age: ~70 years

Imaging Characteristics

Classic findings:

- CT: Basal ganglia hyperdensity
- T1: Basal ganglia hyperintensity

May Also Have Associated:

- T2: Hyperintensity
 - SWI: Susceptibility hypointensity
 - DWI: Restricted Diffusion
- Findings can be bilateral or unilateral. If unilateral, contralateral to side with symptoms.
 - Imaging findings gradually resolve after normalization of glucose.

References:

- Wintermark M, Fischbein NJ, Mukherjee P, Yuh EL, Dillon WP. Unilateral putaminal CT, MR, and diffusion abnormalities secondary to nonketotic hyperglycemia in the setting of acute neurologic symptoms mimicking stroke. *American Journal of Neuroradiology*. Published June 1, 2004. <https://www.ajnr.org/content/25/6/975.long>
- Wu X, Fu R, Yuan C, et al. Case series of 46 patients with nonketotic hyperglycemia-associated chorea: a retrospective follow-up study. *The Journal of Clinical Endocrinology & Metabolism*. Published online July 19, 2025. doi:10.1210/clinem/dgaf394
- Choi JY, Park JM, Kim KH, et al. Radiographic basal ganglia abnormalities secondary to nonketotic hyperglycemia with unusual clinical features. *Clinical and Experimental Emergency Medicine*. 2016;3(4):252-255. doi:10.15441/ceem.15.035
- Chua CB, Sun CK, Hsu CW, Tai YC, Liang CY, Tsai IT. “Diabetic striatopathy”: clinical presentations, controversy, pathogenesis, treatments, and outcomes. *Scientific Reports*. 2020;10(1). doi:10.1038/s41598-020-58555-w
- Chu K, Kang D-W, Kim D-E, Park S-H, Roh J-K. Diffusion-weighted and gradient echo magnetic resonance findings of hemichorea-hemiballismus associated with diabetic hyperglycemia: a hyperviscosity syndrome? *Arch. Neurol*. 2002;59:448–452. doi: 10.1001/archneur.59.3.448.