

AMSER Case of the Month: December 2017

45 male, acute headache + altered mental status

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Patient Presentation

- **CC:** 45 male was transferred from OSH after sxs of **Acute HA + AMS w/ SBP readings of >220**. Pt has garbled speech and R sided weakness on arrival.
- **PMHx:** Uncontrolled HTN
- **PSHx:** none
- **FamHx:** none significant
- **Meds:** none
- **Soc Hx:** none
- **Allergies:** nkda
- **Vitals:** **BP 142/55** (after cardine drip); P 108; R 20; T 98.4F; SpO2 98%
- **Phys Exam:** No trauma; **garbled speech**; **AAO x 1** to self only; **R hand/feet tremor**; other findings wnl

Pertinent Labs

- **Coag:** INR 1.1 (wnl); PTT 20 (slightly low)
- **Glucose:** At admission **197**; various POC readings **>200**
 - No A1C drawn

What Imaging Should We Order?

ACR Appropriateness Criteria for Severe Headache

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 | | ☼☼☼ |

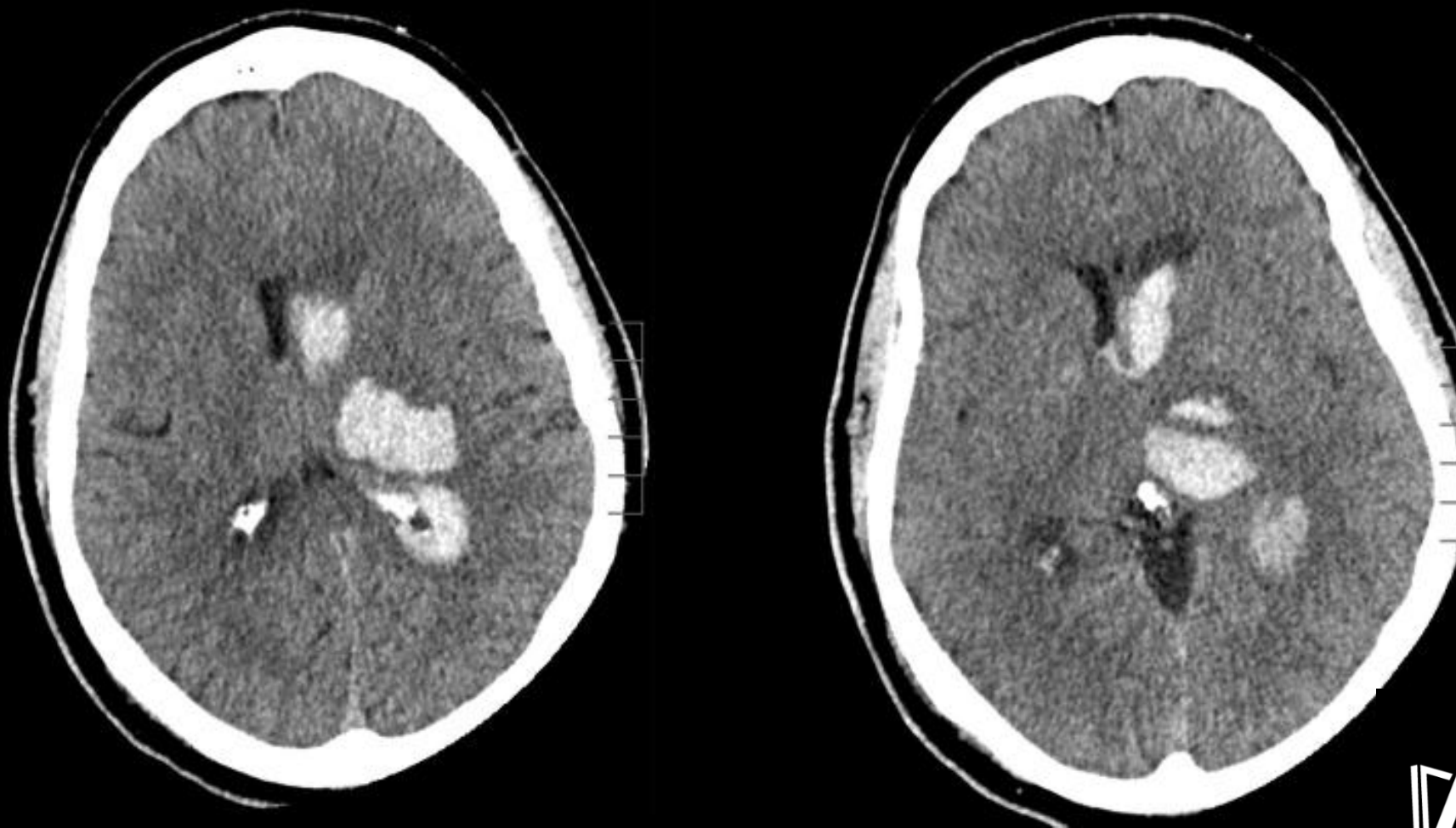
This imaging modality was ordered by the ER physician

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

*Relative Radiation Level



Non Contrast Head CT



Findings:



- **Hematoma** in L thalamic region w/ intraventricular hemorrhage (→)
- **Edema** appears as low attenuation area surrounding hemorrhage (→)
- Slight L to R **mass effect** at level of 3rd ventricle (→)
- Pertinent (-)
 - No hydrocephalus
 - No skull fx

Final Dx:

Spontaneous Hypertensive Intracranial Hemorrhage

Pathophysiology of HTN ICH

- Hypertensive ICH is the most common cause of spontaneous ICH in adults
- Occurs in **branching vessels** that form 90 degrees from parent artery:
 - **Putamen & Caudate** (Lenticulostriate arteries off of M1 segment): 60-65%
 - **Thalamus** (thalamostriate arteries off of P1 and P2 segments): 15-25%
 - **Pons and Midbrain** (penetrators off basilar a.): 10%
- Penetrator vessels develop **intimal hyperplasia & hyalinosis** ⇒ creates focal areas of necrosis and vessel weakness
 - Vessel insults exacerbated by T2DM and glycosylation of vessel walls.
- **Risk factors**: Chronic HTN; M > F; African American

What Should Be Listed on the DDx?

- **Drug Abuse**
 - Suspect if SBP is acutely elevated prior to ICH
- **Cerebral Amyloid Angiopathy**
 - Lobar >> Basal ganglionic hemorrhage
 - Elderly >> Middle-aged adults
 - Typically normotensive
- **Hemorrhagic Neoplasm (Primary or 2ndary)**
 - Elderly >> Middle-aged adults
- **Venous Thrombosis**
 - Lobar >> basal ganglia
 - Hyperdense dural sinus (may not be present)
- **Coagulopathy**
- **AVM**
 - Typically normotensive
 - Children >> Adults

Treatment Guidelines

- Lower SBP to 140 (if initial SBP is >200)
- Target glucose: 140-180 mg/dL
- SCDs for DVT ppx
- NS for maintenance and replacement fluids
- NPO until swallowing fxn is evaluated.
- If GCS <8, Intubate to decrease risk of aspiration
- Reverse coagulopathy, if applicable

References:

- **Healthcare Bluebook**

- [https://healthcarebluebook.com/page_ProcedureDetails.aspx?cftid=496&g=MRI%20Angiography%20of%20Head%20\(with%20and%20without%20contrast\)&directsearch=true](https://healthcarebluebook.com/page_ProcedureDetails.aspx?cftid=496&g=MRI%20Angiography%20of%20Head%20(with%20and%20without%20contrast)&directsearch=true)
- [https://healthcarebluebook.com/page_ProcedureDetails.aspx?cftid=130&g=Brain%20CT%20\(no%20contrast\)&directsearch=true](https://healthcarebluebook.com/page_ProcedureDetails.aspx?cftid=130&g=Brain%20CT%20(no%20contrast)&directsearch=true)

- **ACR Appropriateness Criteria**

- <https://acsearch.acr.org/docs/69482/Narrative/>

- **UpToDate: Hypertensive Hemorrhage**

- https://www.uptodate.com/contents/spontaneous-intracerebral-hemorrhage-pathogenesis-clinical-features-and-diagnosis?source=search_result&search=hypertensive%20hemorrhage&selectedTitle=2~150

- **StatDx: Hypertensive Intracranial Hemorrhage**

- <https://my.statdx.com/document/hypertensive-intracranial-hemorrha-/ede94133-19a8-43b5-a0e3-34046da31f92?searchTerm=Hypertensive%20Intracranial%20Hemorrhage>