AMSER Case of the Month: March 2020

Impaired Consciousness

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Patient Presentation

- 30 year old female with PMH complete heart block s/p pacemaker, tricuspid valve endocarditis, IV drug abuse, acute septic pulmonary embolism found unresponsive in her home by EMS
- Per EMS, it was unclear how long the patient had been unresponsive
- Drug paraphernalia was noted to be present near the patient
- Patient was in pulseless electrical activity (PEA) and CPR was initiated
- Patient received 9 mg Epinephrine, 1 mg Atropine, 1 mg Bicarb on the field
- Return of spontaneous respiration (ROSC) achieved
- No intact neurological reflexes

Pertinent Labs

- ABG:
  - pH, Blood Gas: 7.011
  - $PACO_2$: 46.9 mmHg
  - PO_2 Arterial: 209.0 mmHg
  - $\%HBO_2$: 95.8
  - Carboxyhemoglobin: 0.6%

Cardiac Enzymes:

- Troponin T: 7.78 ng/ml

What Imaging Should We Order?
ACR Appropriateness Criteria

New 2018

American College of Radiology
ACR Appropriateness Criteria®
Acute Mental Status Change, Delirium, and New Onset Psychosis

Variant 1: **Acute mental status change. Increased risk for intracranial bleeding (ie, anticoagulant use, coagulopathy), hypertensive emergency, or clinical suspicion for intracranial infection, mass, or elevated intracranial pressure. 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 without and with IV contrast	May Be Appropriate	☢☢☢
CT head with IV contrast	Usually Not Appropriate	☢☢☢

This imaging modality was ordered by the ER physician

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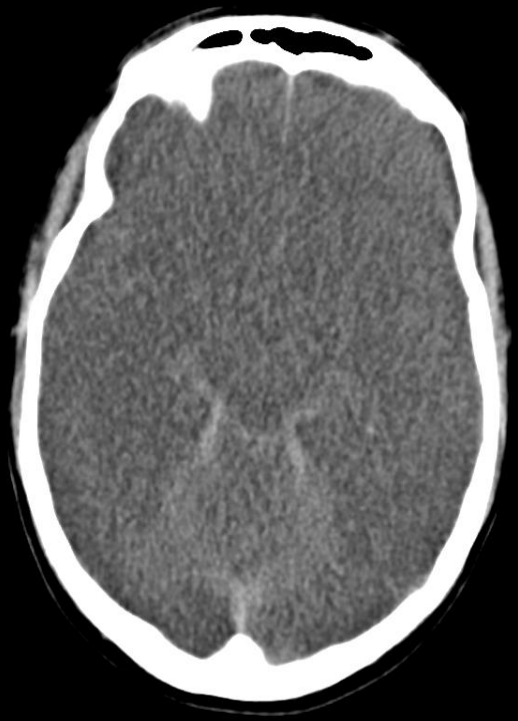
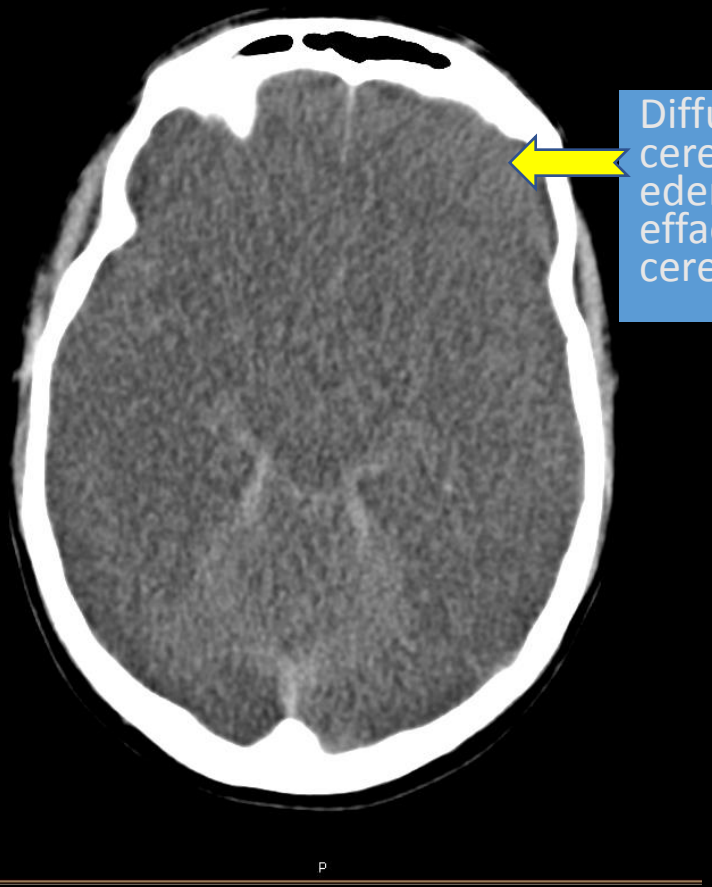
Findings (unlabeled)

Normal CT (2 months earlier)



Findings: (labeled)

Partial effacement of the ventricles



Diffuse cerebral edema with effacement of cerebral sulci

Findings from a compantion case (unlabeled)

Normal- 2 months PTA

Current scan

At the level of the skull base.

Findings: Effacement of the supersellar cistern, sulcal effacement. Indicating herniation

At the level of the skull base.

Final Dx:

Anoxic Brain Injury

Case Discussion (1-3 slides)

- Non-Contrast Head Computed Tomography (CT) demonstrated diffuse loss of gray-white differentiation compatible with severe cerebral edema

- Associated mass effect including effacement of cerebral sulci, partial but near complete effacement of the basal cisterns, partial effacement of the ventricles, uncal and transtentorial herniation

Anoxic – Ischemic Brain Injury

- Most often results from insults such as cardiac arrest (as in this case), head trauma, vascular catastrophe, poisoning (drug overdose)
- Many patients will expire without recovering awareness
- Cerebral edema and transtentorial herniation is a feared and deadly complication

References:

-Hypothermia after Cardiac Arrest Study Group. Mild therapeutic hypothermia to improve the neurologic outcome after cardiac arrest. N Engl J Med 2002; 346:549.

-Saposnik G, Maurino J, Saizar R, Bueri JA. Spontaneous and reflex movements in 107 patients with brain death. Am J Med 2005; 118:311.

- Estraneo A, Moretta P, Loreto V. Late recovery after traumatic, anoxic, or hemorrhagic long-lasting vegetative state. Neurology 2010; 75:239.