AMSER Case of the Month: January 2019

70 y/o M with confusion and recent fall

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Patient Presentation

- 70 y/o M with week long history of frequent falls and confusion. Patient fell and hit head on one occasion.
- Patients admits to dizziness.

- PMHx: Alzheimer's disease, HTN, diabetes, dyslipidemia
- Vitals: WNL except HTN (159/92)
- Physical Exam: WNL

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Clinical Condition: Head Trauma

Variant 2: Minor or mild acute closed head injury (GCS ≥13), imaging indicated by NOC or CCHR or NEXUS-II clinical criteria (see Appendix 1). Initial study.

Radiologic Procedure	Rating	Comments	RRL*
CT head without IV contrast	9		☢☢☢
MRI head without IV contrast	5	This procedure may be appropriate in the outpatient setting, but there was disagreement among panel members on the appropriateness rating as defined by the panel's median rating.	O
MRA head and neck without IV contrast	2		O
MRA head and neck without and with IV contrast	2		O
CTA head and neck with IV contrast	1		☢☢☢
MRI head without and with IV contrast	1		O
MRI head without IV contrast with DTI	1		O
CT head without and with IV contrast	1		☢☢☢
CT head with IV contrast	1		☢☢☢
Tc-99m HMPAO SPECT head	1		☢☢☢☢
FDG-PET/CT head	1		☢☢☢☢
X-ray skull	1		☢
Arteriography cervicocerebral	1		☢☢☢

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

*Relative Radiation Level

This imaging modality was ordered by the ER physician

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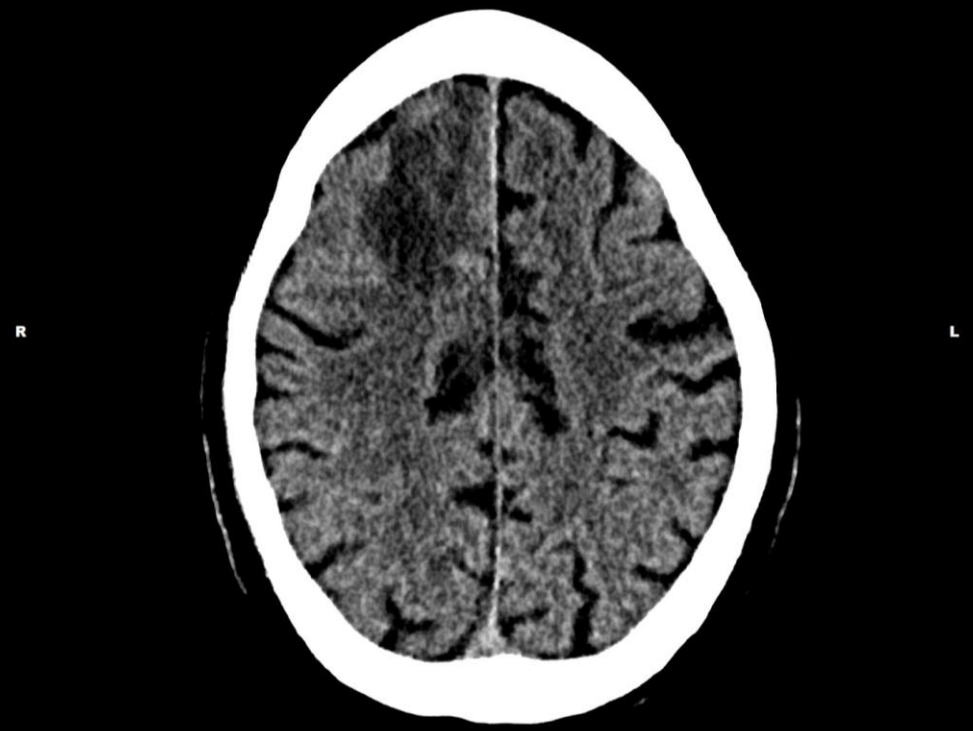
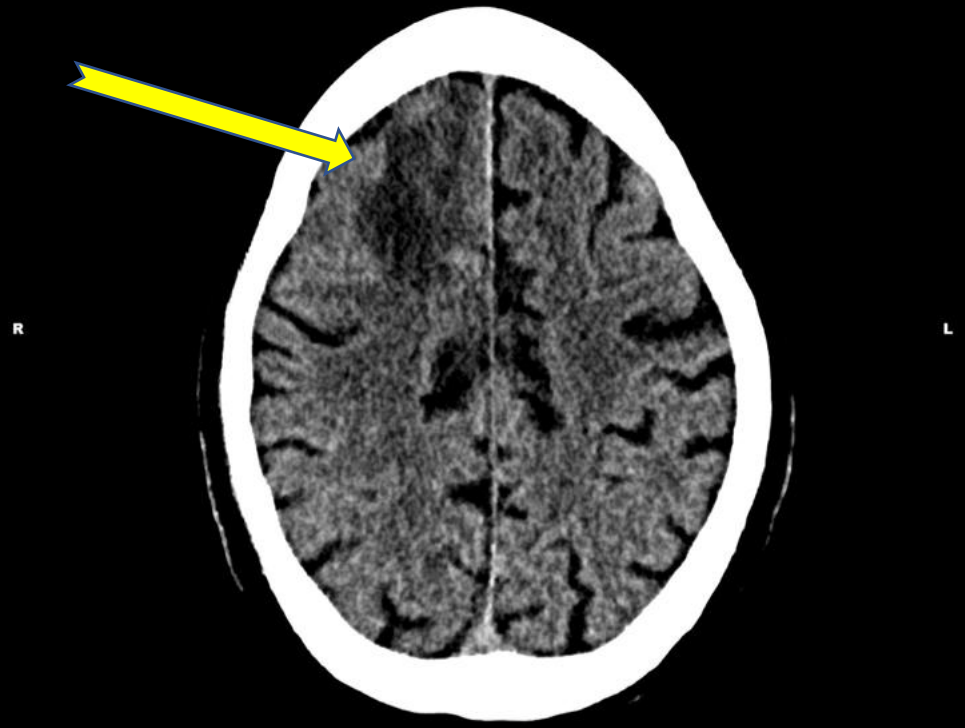
Findings (unlabeled)



Findings: (labeled)

CT Head without Contrast

- Hypodensity with suspected underlying vasogenic edema.
- Concern for underlying mass.
- Recommended MRI with and without contrast for further characterization.



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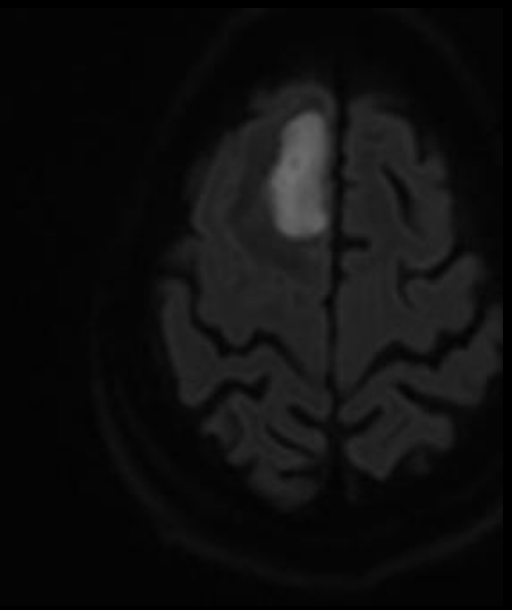
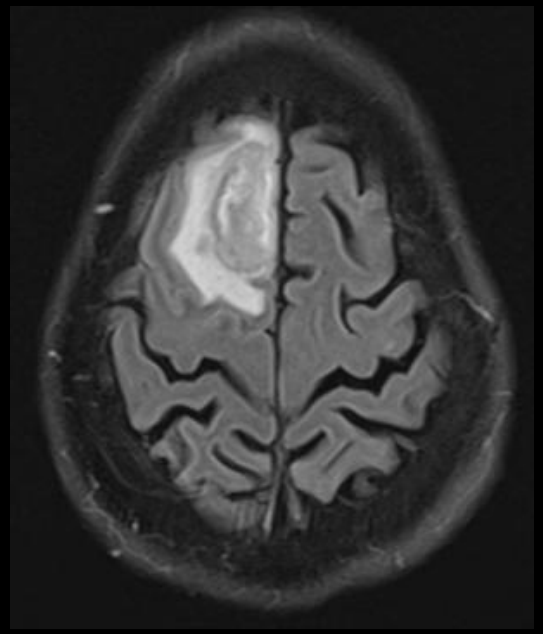
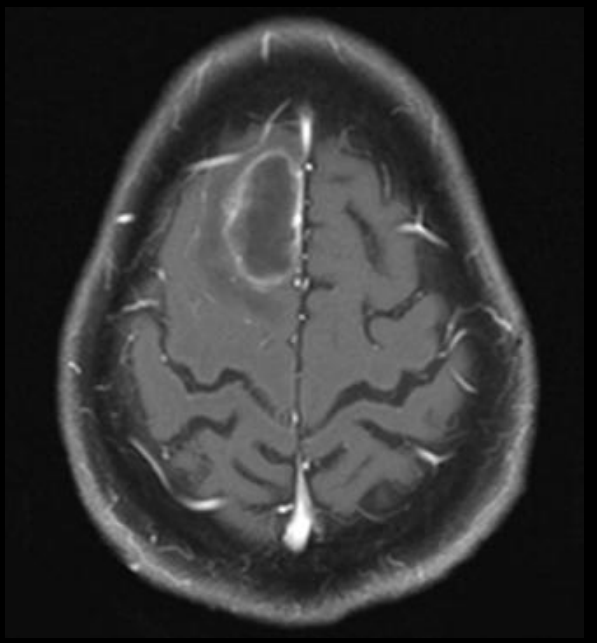
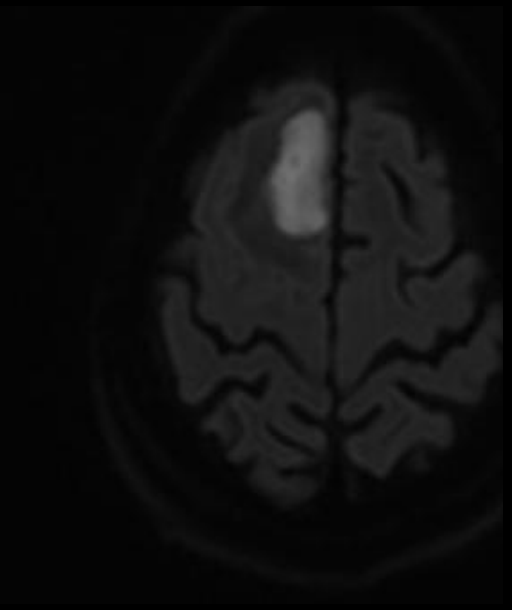






Findings (labeled)

Axial B1000



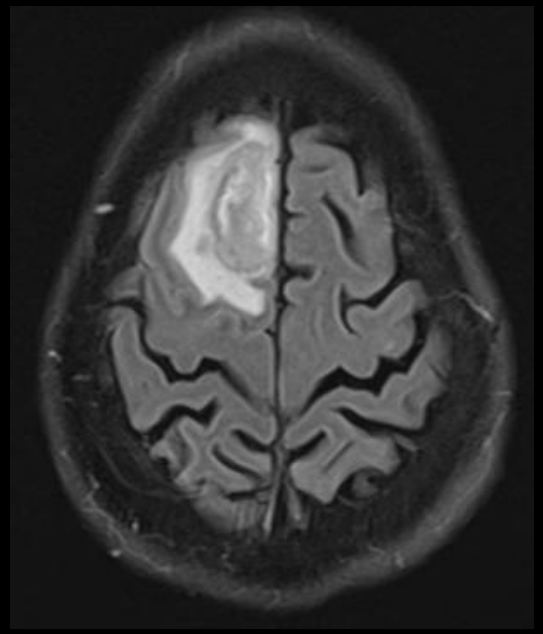
Increased signal
Right Frontal Cortex

Axial ADC

Decreased signal
Right Frontal Cortex

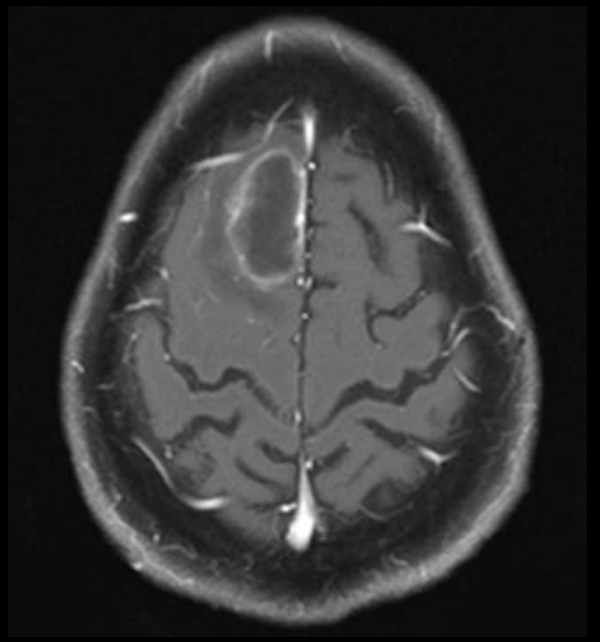
Indicates Restricted Diffusion:
Non-specific indicator of hemorrhage, neoplasm, infarct, ictal focus, demyelination or infection

Axial FLAIR



Heterogeneous lesion with surrounding vasogenic edema

Axial Postcontrast T1



Ring enhancing lesion

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Differential Dx for Ring Enhancing Lesion

- Mnemonic = MAGIC DR

M = Metastasis

A = Abscess

G = Glioblastoma

I = Infarct

C = Contusion

D = Demyelinating Disease

R = Radiation Necrosis or Resolving Hematoma

Our Patient

- Neurosurgical biopsy:

well-circumscribed lesion, purulent material, STAT culture: gram + cocci on gram stain and frozen

- Pathology Report:

Reactive brain parenchyma with abscess, mixed inflammation and foamy macrophages. No evidence of neoplasia. Bacterial colonies present.

Final Dx:

Brain Abscess

Brain Abscess

- Pathogenesis:
  - Invasion either by direct spread or hematogenous seeding
    - Direct spread 20-60% of cases

- Most commonly via Staph aureas, Strep species, Bacteroides fragiles

- Presentation is non-specific:
  - Fever, headache, vomiting

- S/p Brain abscess evacuation 80% of patients have good outcomes

- Poor prognostic indicators:

-delayed diagnosis/presenting symptoms

-multiple lesions

-fungal etiology

References:

"Brain Abscess - Neurologic Disorders." *Merck Manuals Professional Edition*, www.merckmanuals.com/professional/neurologic-disorders/brain-infections/brain-abscess.

Gaillard, Frank. "Cerebral Ring Enhancing Lesions | Radiology Reference Article." *Radiopaedia.org*, radiopaedia.org/articles/cerebral-ring-enhancing-lesions.

Miranda, Hernando Alvis, et al. "Brain Abscess: Current Management ." *Journal of Neurosciences in Rural Practice*, Medknow Publications & Media Pvt Ltd, Aug. 2013, www.ncbi.nlm.nih.gov/pmc/articles/PMC3808066/.

Refaey, Mohamed. "Cerebral Ring Enhancing Lesions (Mnemonic) | Radiology Reference Article." *Radiopaedia.org*, radiopaedia.org/articles/cerebral-ring-enhancing-lesions-mnemonic.

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