30-year-old female with history of headache, fever, and altered mental status

Jignesh Modi, MD

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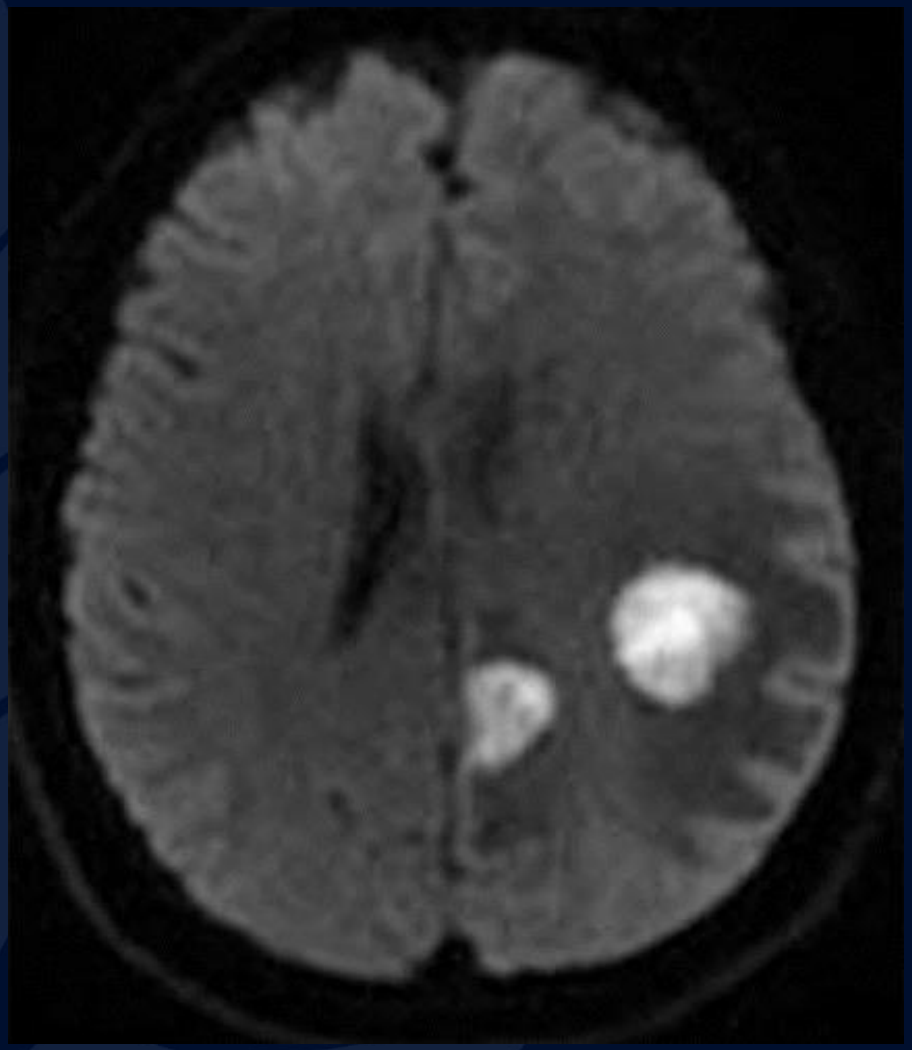
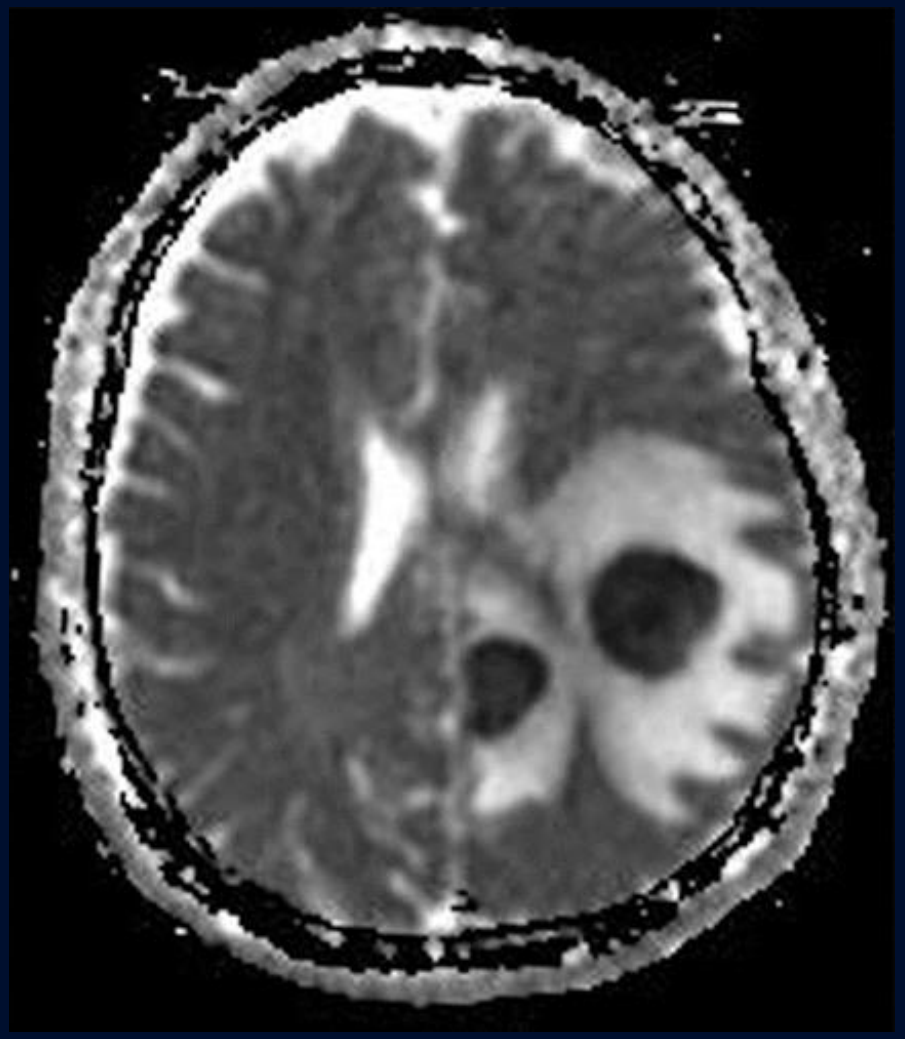


DWI



ADC

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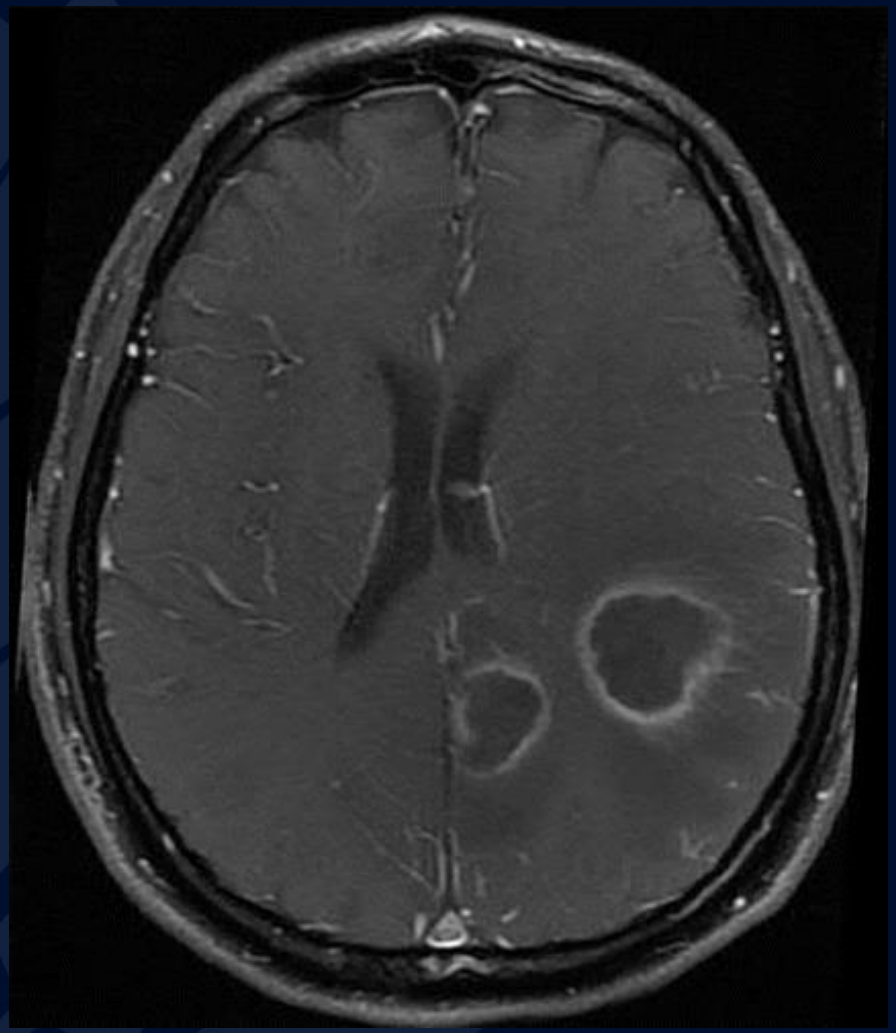
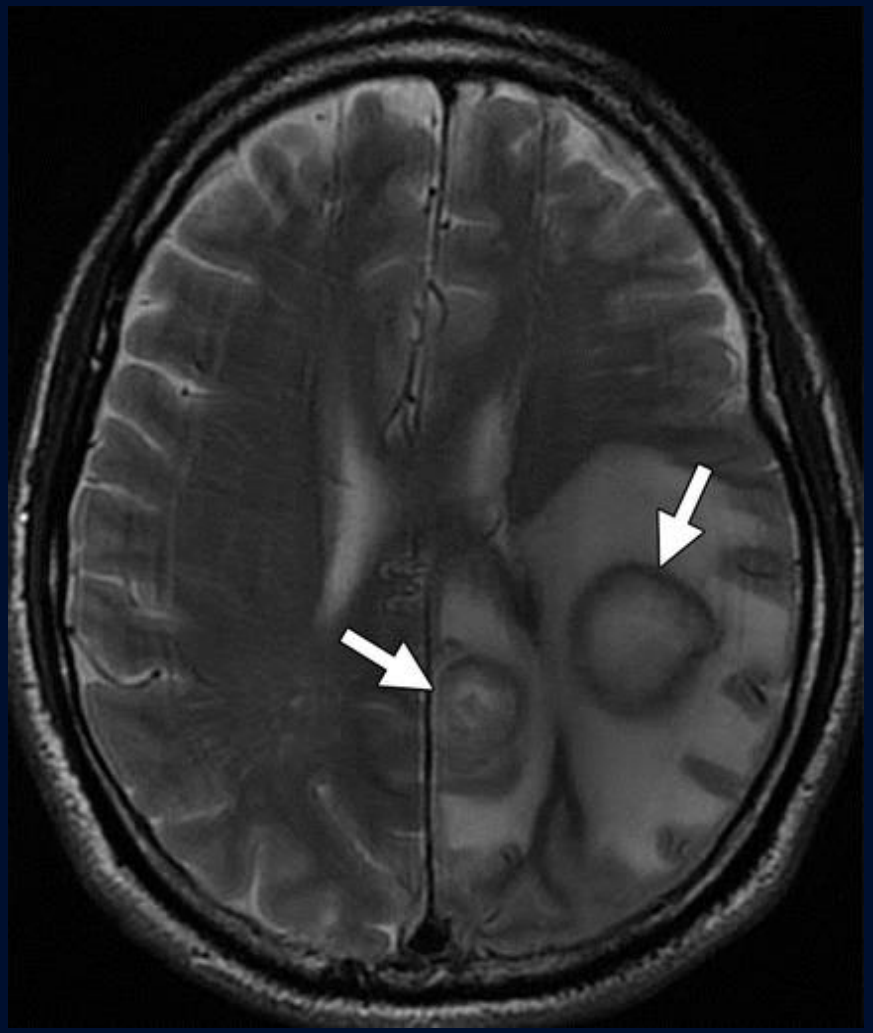


Axial T1 post contrast



Axial T2

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Cerebral Abscess

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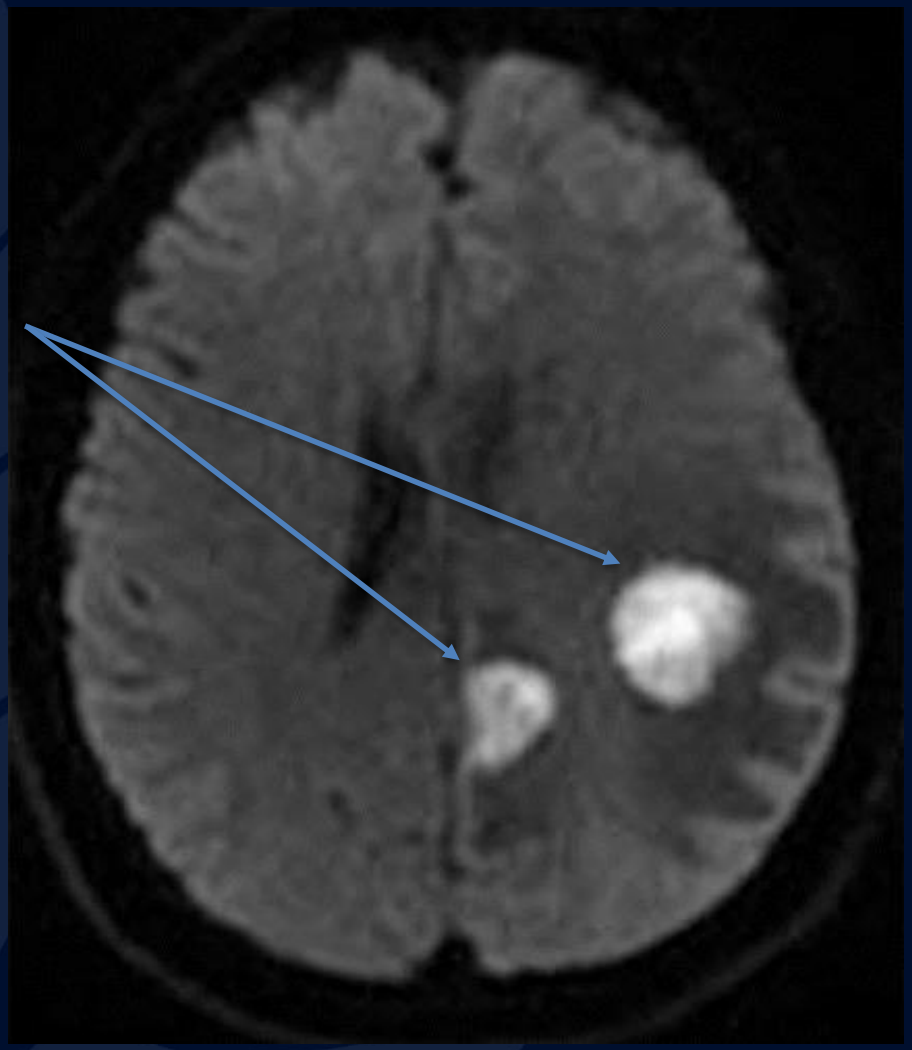
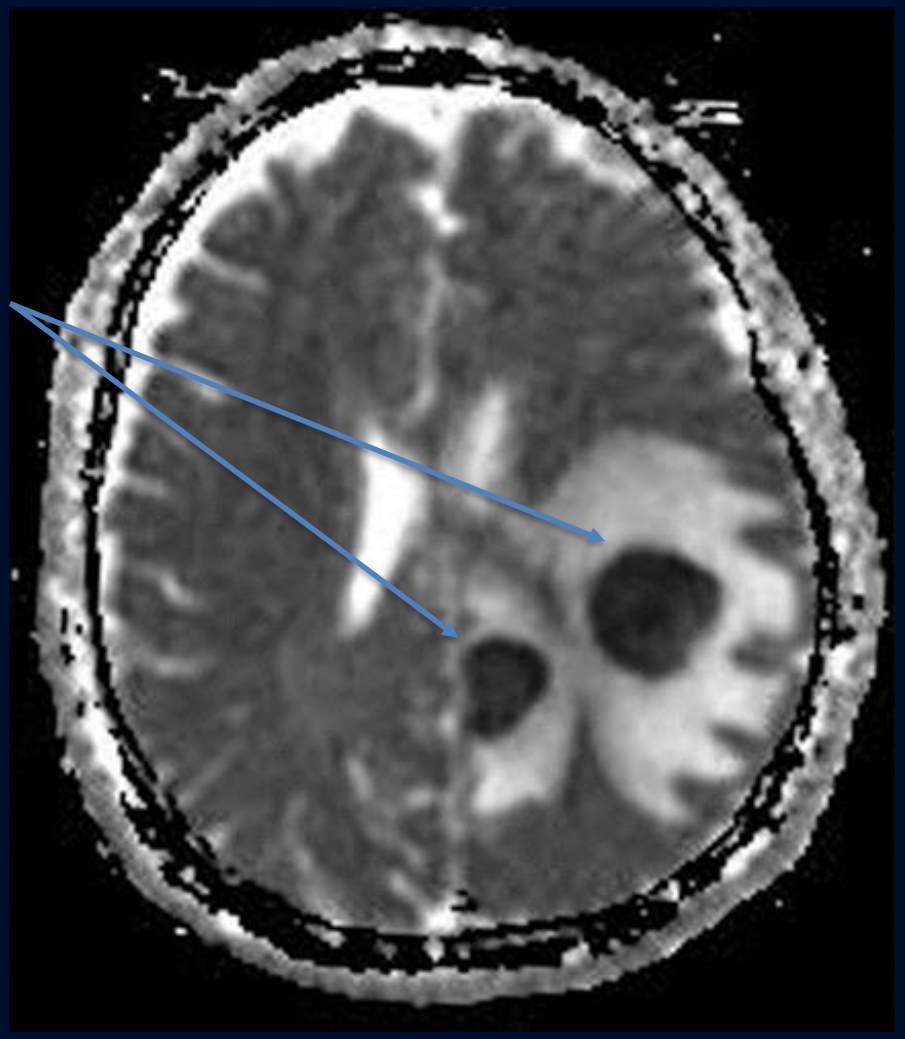


DWI

High diffusion signal



ADC

Low ADC signal

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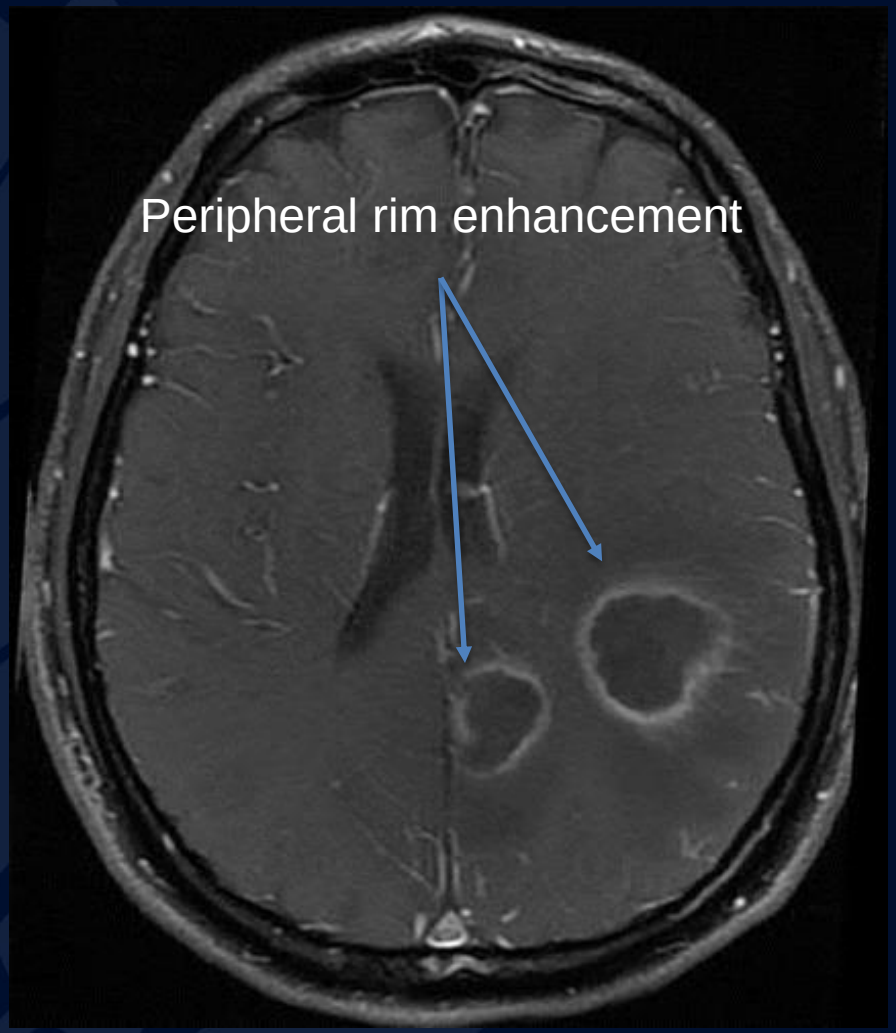
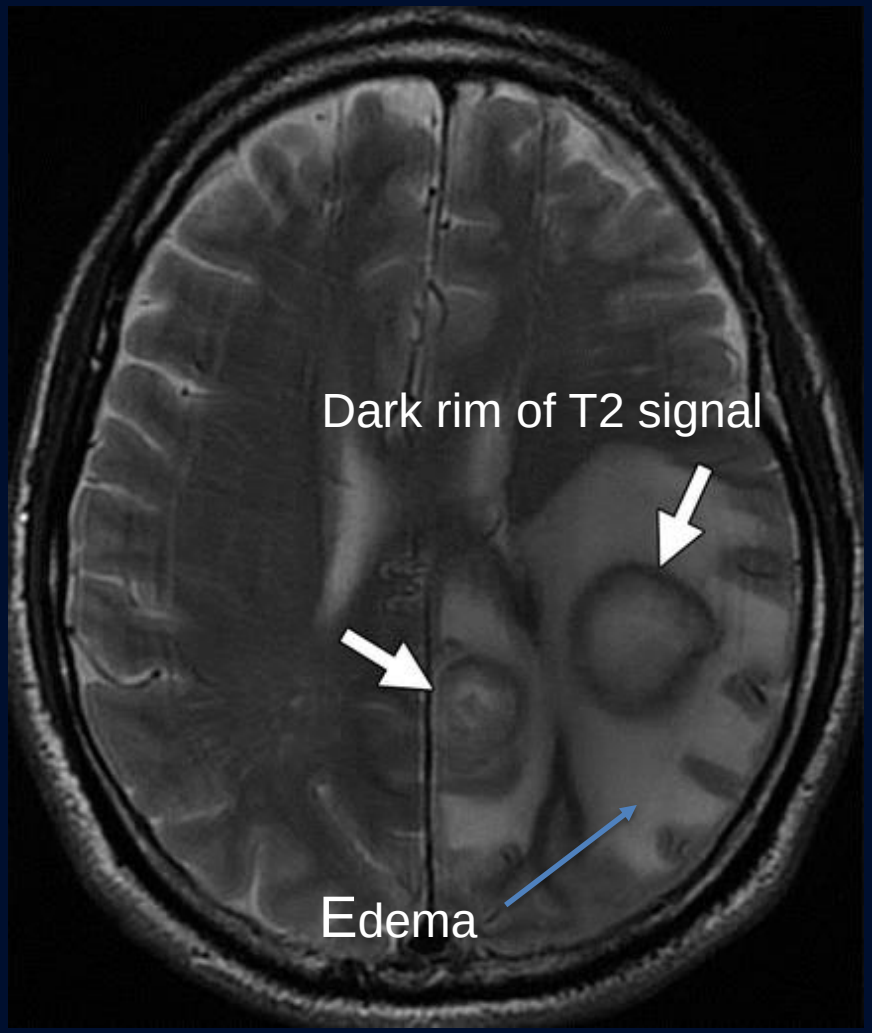


Axial T1 post contrast



Axial T2

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Cerebral Abscess

- Focal area of parenchymal infection consisting of a central cavity of purulent exudate with surrounding vascularized, collagenous capsule
- 4% of CNS infections annually
- M >F, first 4 decades of life
- Predisposing factors include diabetes, alcoholism, IV drug use, pulmonary lesion, immunosuppression
- Pathophysiology
  - Hematogenous dissemination results in multiple abscesses near grey-white matter junctions within MCA territory bilaterally
  - Direct invasion
  - Iatrogenic
  - Children may have underlying congenital heart disease
- Other sources of infection include untreated otitis media, odontogenic infections, neurosurgical procedures

Cerebral Abscess

- Symptoms vary by location, extent of mass effect and associated complications: meningitis/headache 50-90%, fever 60%, and altered sensorium 30-70%
- Organisms are usually according to age and similar for meningitis
  - Streptococcus - most common in adults
  - Gram negative - infants,
  - Listeria - pregnant women and older patients
  - GBS and E. coli - neonates
  - Many others in immunocompromised individuals
- Labs often unrevealing, absence of leukocytosis or CSF pathogens CSF does not preclude diagnosis.
- LP is often discouraged and even contraindicated to avoid herniation or ventricular rupture
- Complications include hydrocephalus, herniation, cranial nerve involvement

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Imaging Findings

- MRI: Rim enhancing lesion at grey-white matter junction
  - T1
    - Rim iso or hyperintense (if hemorrhagic)
    - Post contrast rim enhancement
  - T2
    - Smooth, thin, circumferential rim hypointense to white matter
    - Useful in distinguishing from necrotic glioma
  - DWI
    - Central restricted diffusion due to proteinaceous content / inflammatory exudate
- MR Spectroscopy
  - Elevated peaks are seen corresponding to lipids/lactate, succinate, acetate, and amino acids

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Summary

- Familiarity with classic imaging appearance of **rim enhancing lesion on post contrast** imaging and **dark rim of T2** are the hallmark of cerebral abscess and helps to differentiate from other rim enhancing lesions
- Treatment includes neurosurgery intervention for drainage and antibiotics depending upon organisms

Classic differential of rim enhancing lesions (DR MAGICAL)

- D: Demyelinating disease – Dawson fingers in MS
- R: Radiation necrosis or resolving hematoma – hematoma usually on CT
- M: Metastasis - history of cancer, irregular shaped multiple lesions
- A: Abscess
- G: Glioblastoma
- I: Infarct (subacute phase) or inflammatory (neurocysticercosis, tuberculoma)
- C: Contusion – hemorrhagic foci
- A: AIDS – patient history
- L: Lymphoma – solid lesion or dark lesion on T2W

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