



Cerebral Toxoplasmosis

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Epidemiology

- ◆ 10-50% toxoplasma seropositivity in US adults
- ◆ Seropositivity increases with age
- ◆ CNS toxo very rarely presenting illness for HIV diagnosis
- ◆ Incidence has greatly decreased in post-HAART era
- ◆ Incidence also decreased due to prophylaxis

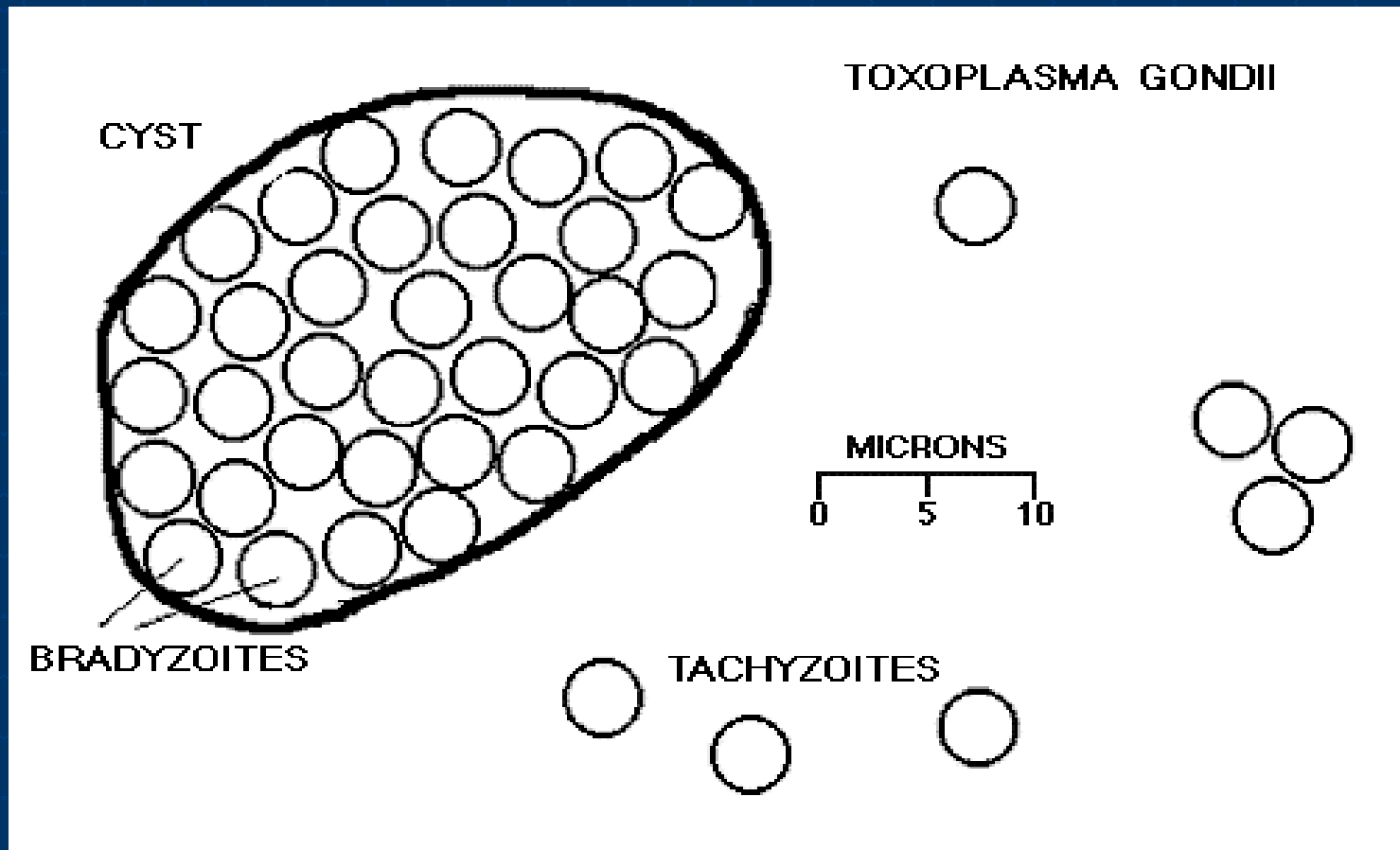
Epidemiology

- ◆ Incidence up to 3.7% in US HIV+ Males, highest in Haitian immigrants
- ◆ For CD4 <300, 2.3 pts/100 person-yrs
- ◆ 5% of deaths in HIV infected persons in pre-HAART era
- ◆ Incidence now rivals PCNSL

Pathogenesis

- ◆ Intracellular Protozoan Parasite
- ◆ 3 forms – Tachyzoite (asexual), Bradyzoite (tissue cyst), Sporozoite (oocyst)
- ◆ Able to infect any mammalian cell
- ◆ Tissue cysts are reservoir for infection and allow for spread

Pathogenesis



Pathogenesis

- ◆ Tachyzoites invade intestinal lining, encyst most frequently in brain, heart, skeletal muscle
- ◆ Oocysts form only in cat – excreted in feces, can contaminate soil/food products
- ◆ Infection is generally from ingestion of cysts or oocysts

Clinical Presentation

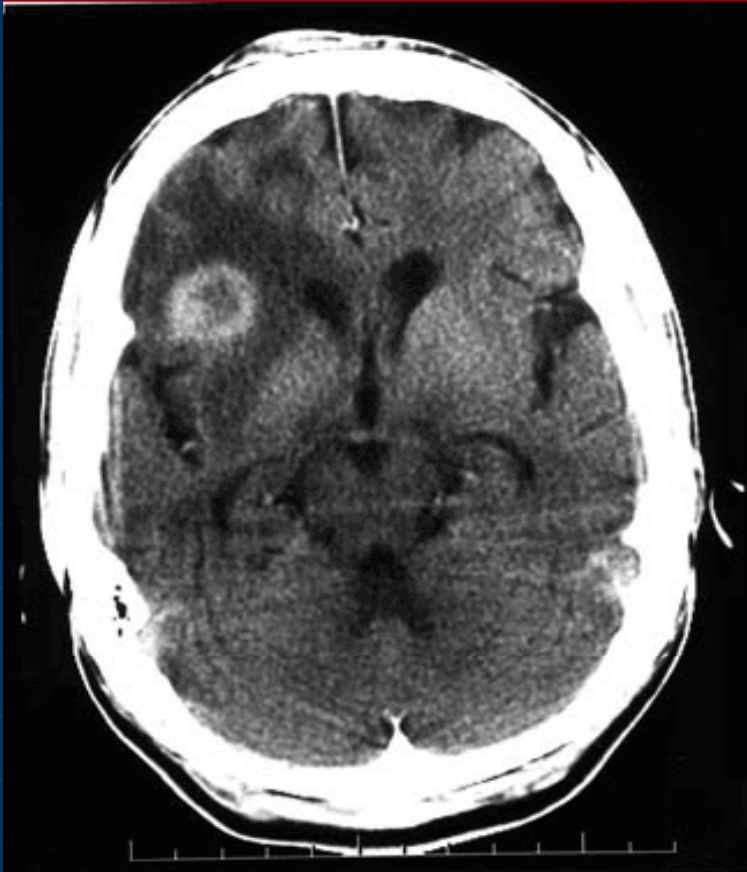
- ◆ HA in 50% - usually mild
- ◆ Fever in 40-50%
- ◆ 15-30% present w/ seizures
- ◆ Rarely frank meningitis
- ◆ 50-75% of HIV patients with focal neurologic deficit

Imaging

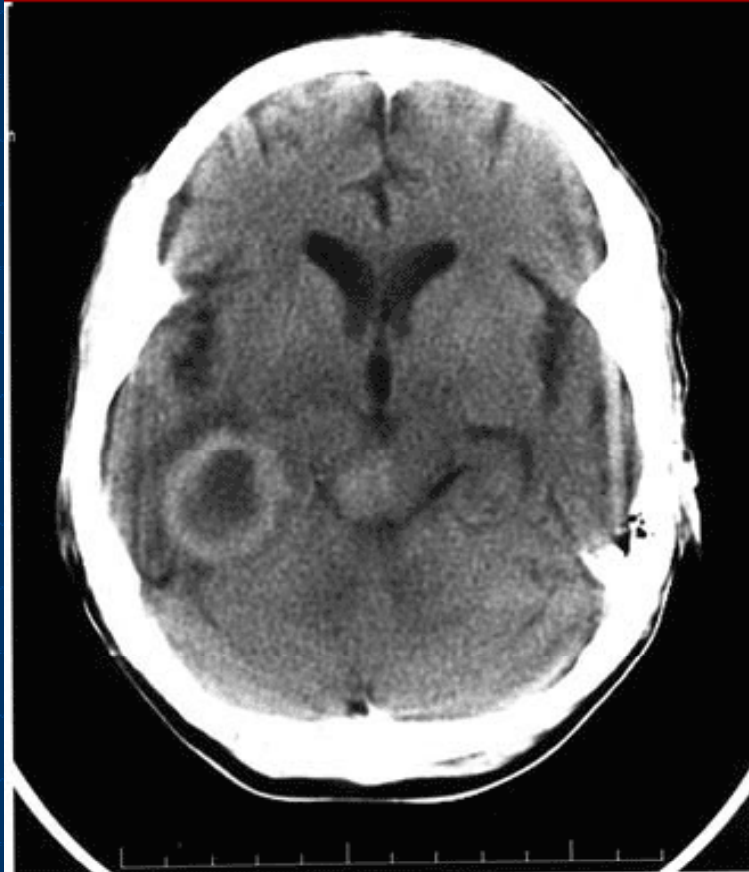
- ◆ CT shows hypodense lesions
- ◆ Multiple in 70-80%
- ◆ Ring enhancing w/ contrast
- ◆ MRI: Hypointense T1, Hyperintense T2
- ◆ May be multifocal w/ diffuse white matter edema
- ◆ Thallium SPECT has been helpful in differentiating from PCNSL

Imaging

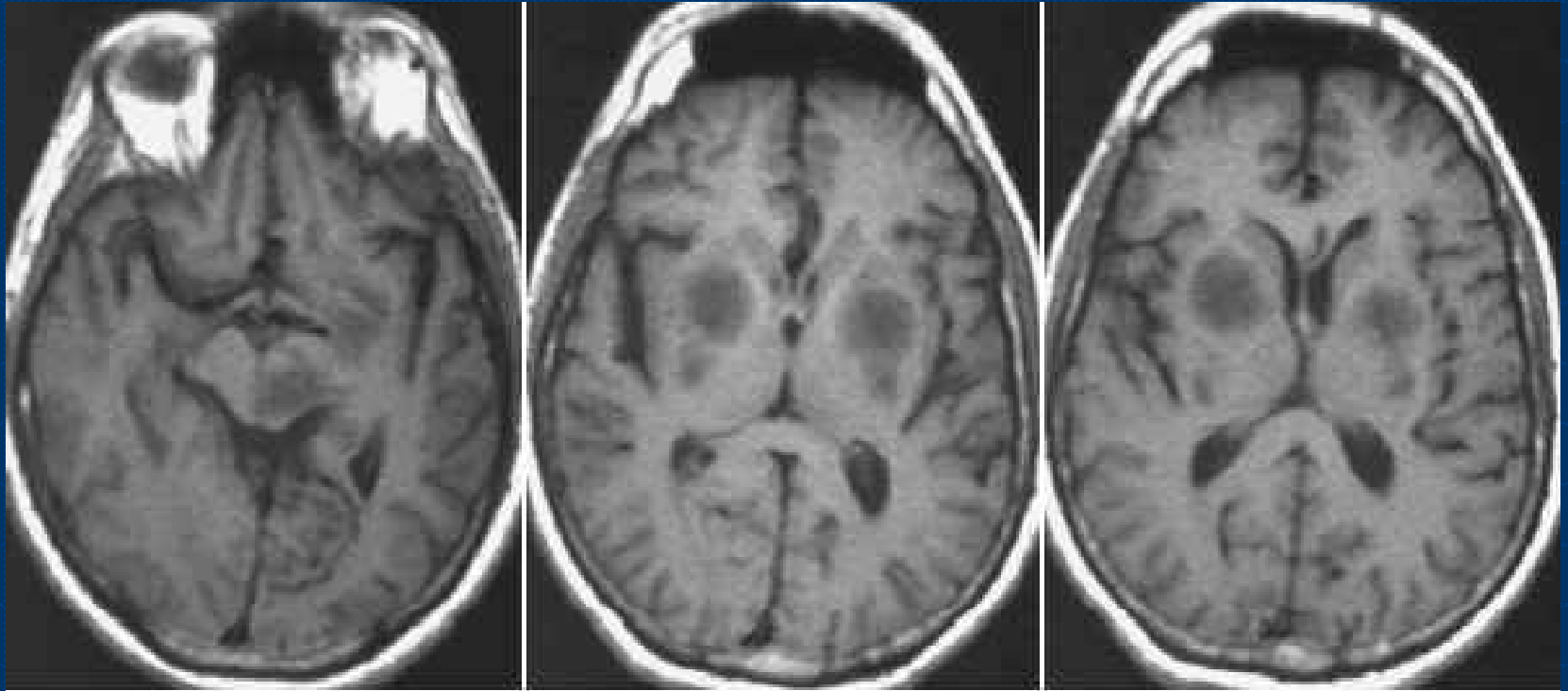
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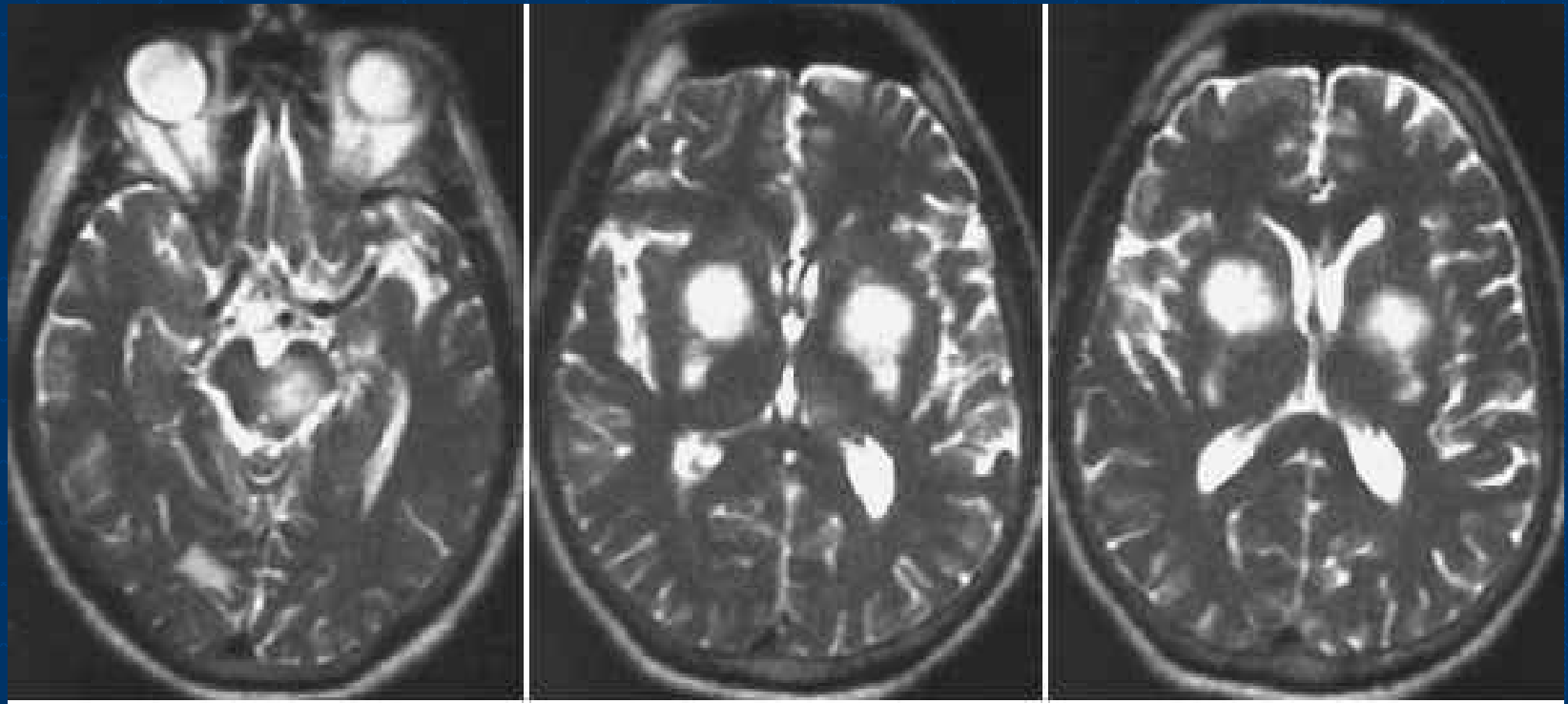
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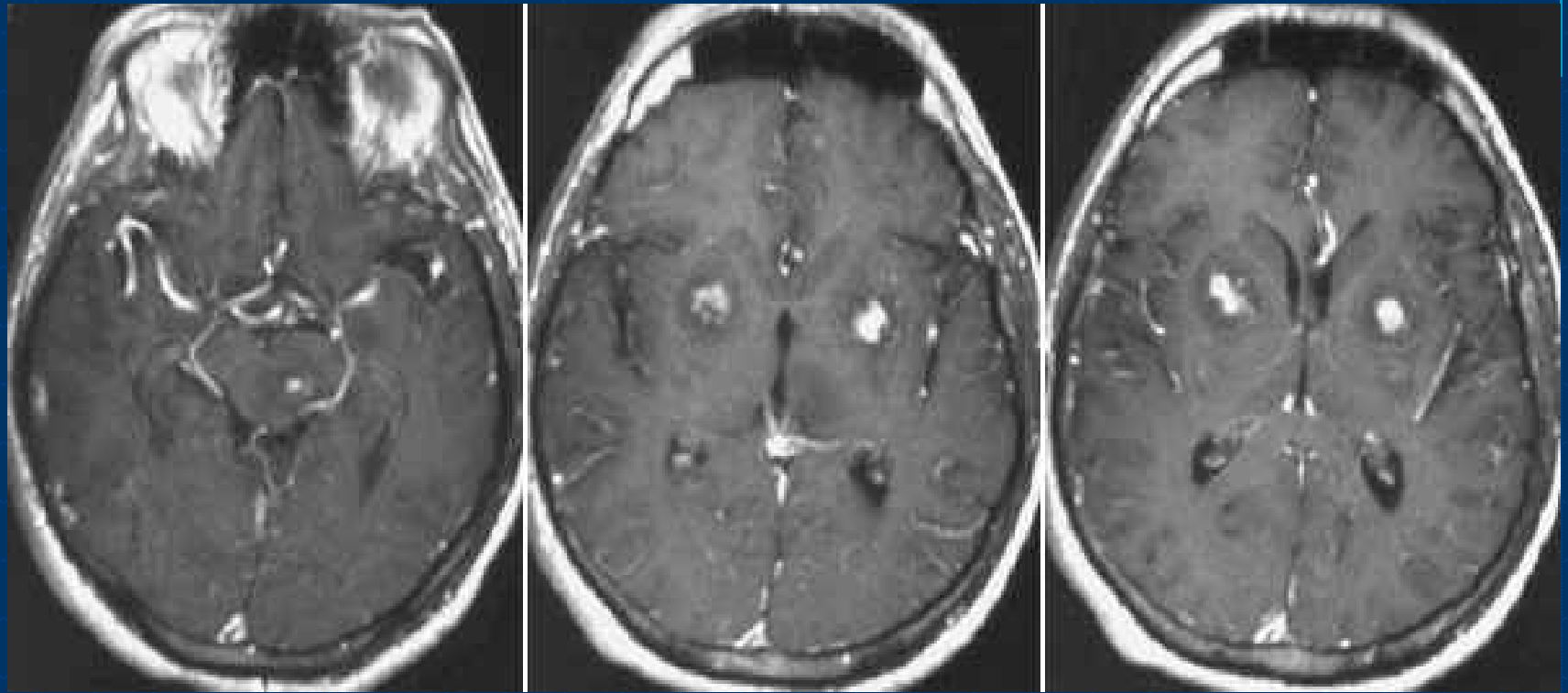
Imaging



Imaging



Imaging



Differential Diagnosis

- ◆ PCNSL
- ◆ PML
- ◆ Tuberculoma
- ◆ Bacterial Brain abscess
- ◆ Fungal Abscess (aspergillus, cryptococcus, candida)

Diagnostic Tests

- ◆ Serum Toxo IgG, IgM – positive 80-90%
- ◆ CSF- mild pleocytosis, increased protein
- ◆ CSF PCR – High specificity, low sensitivity – rarely indicated
- ◆ Empiric Therapy
- ◆ Stereotactic Brain Biopsy

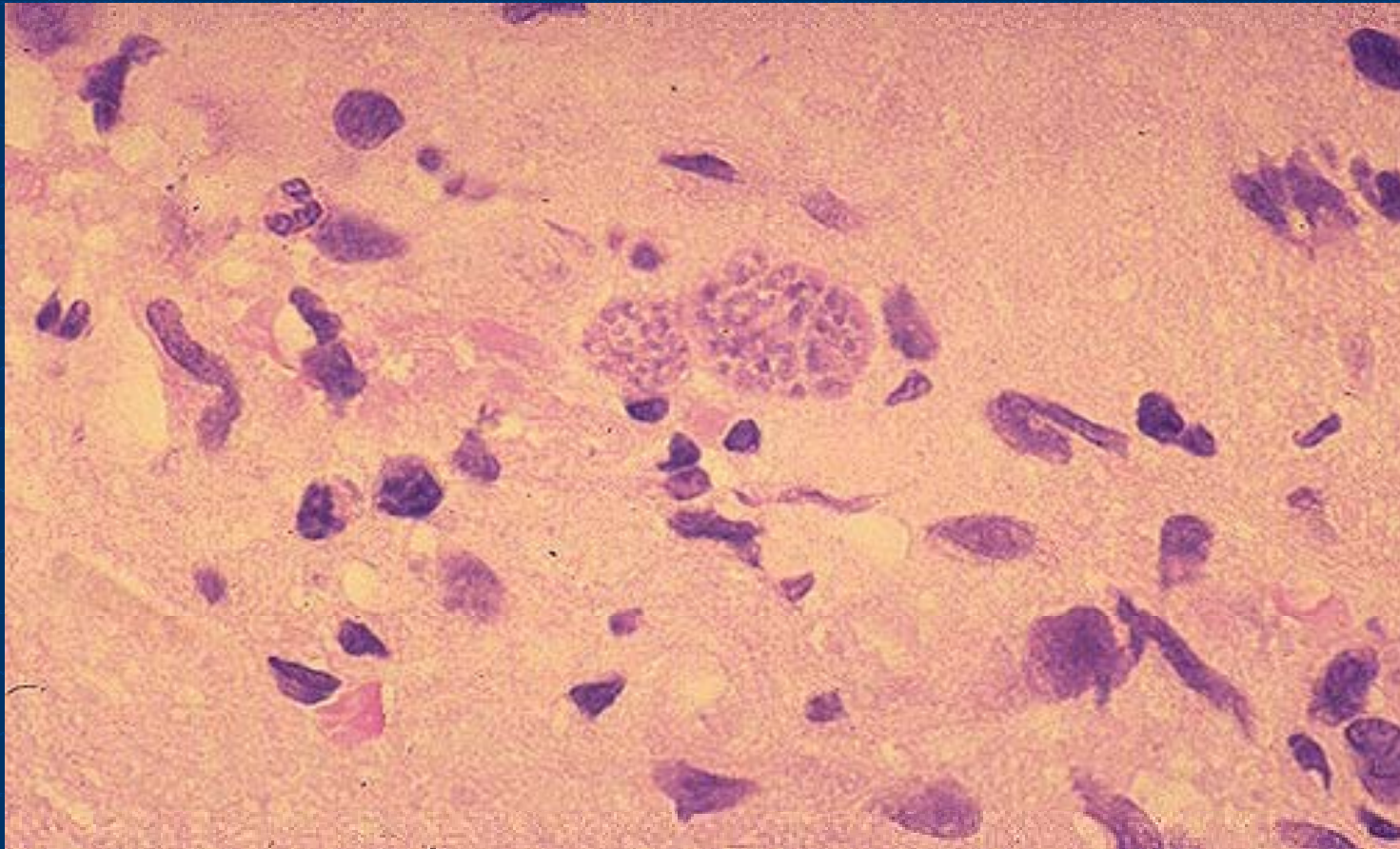
Pathology

- ◆ Gross: dry, granular central necrotic region surrounded by minimal inflammation, petechial hemorrhage
- ◆ Microscopic: free tachyzoites and encysted bradyzoites may be found at periphery of necrosis, prominent vascular thrombosis
- ◆ Easily recognized on immuno staining

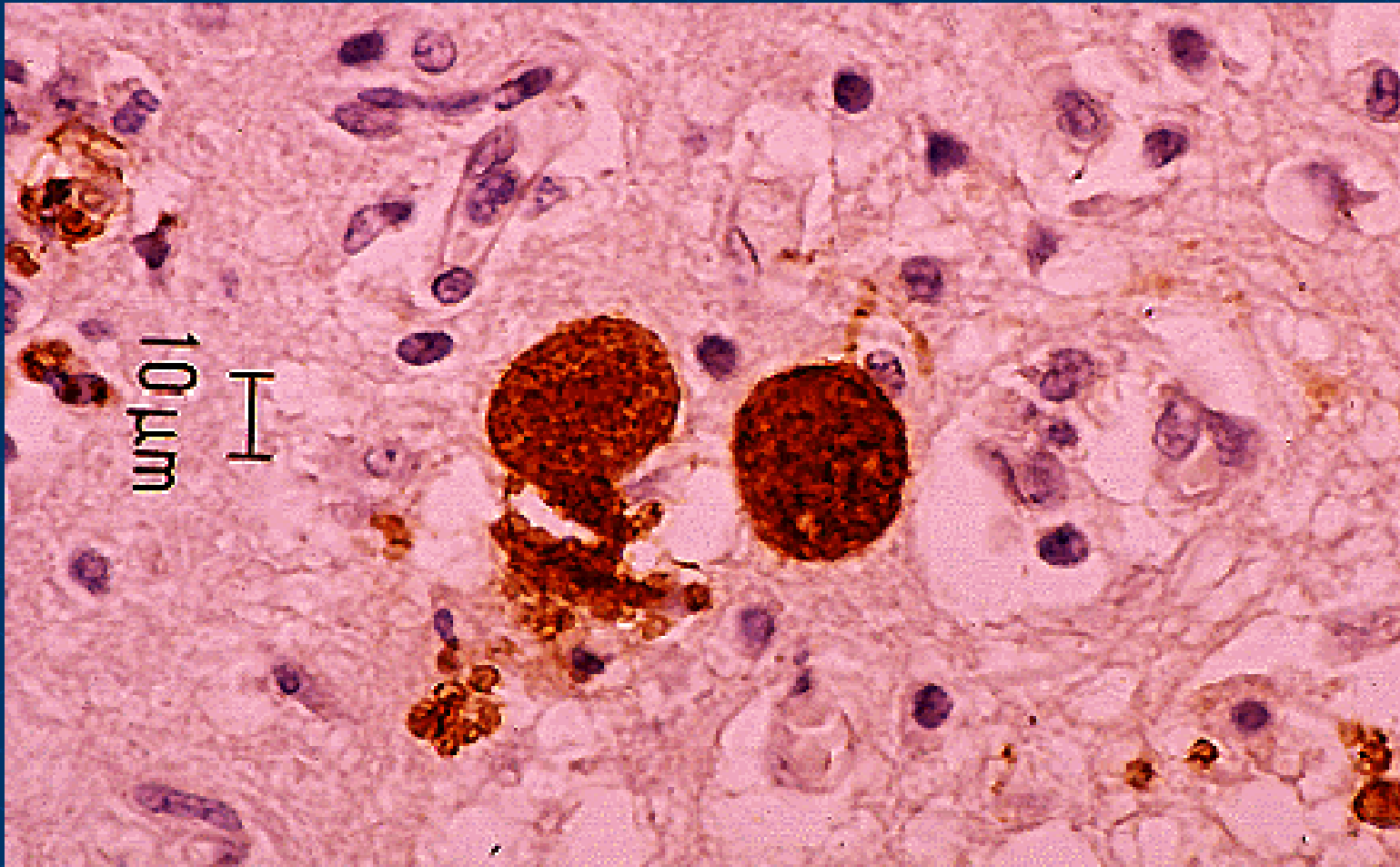
Pathology



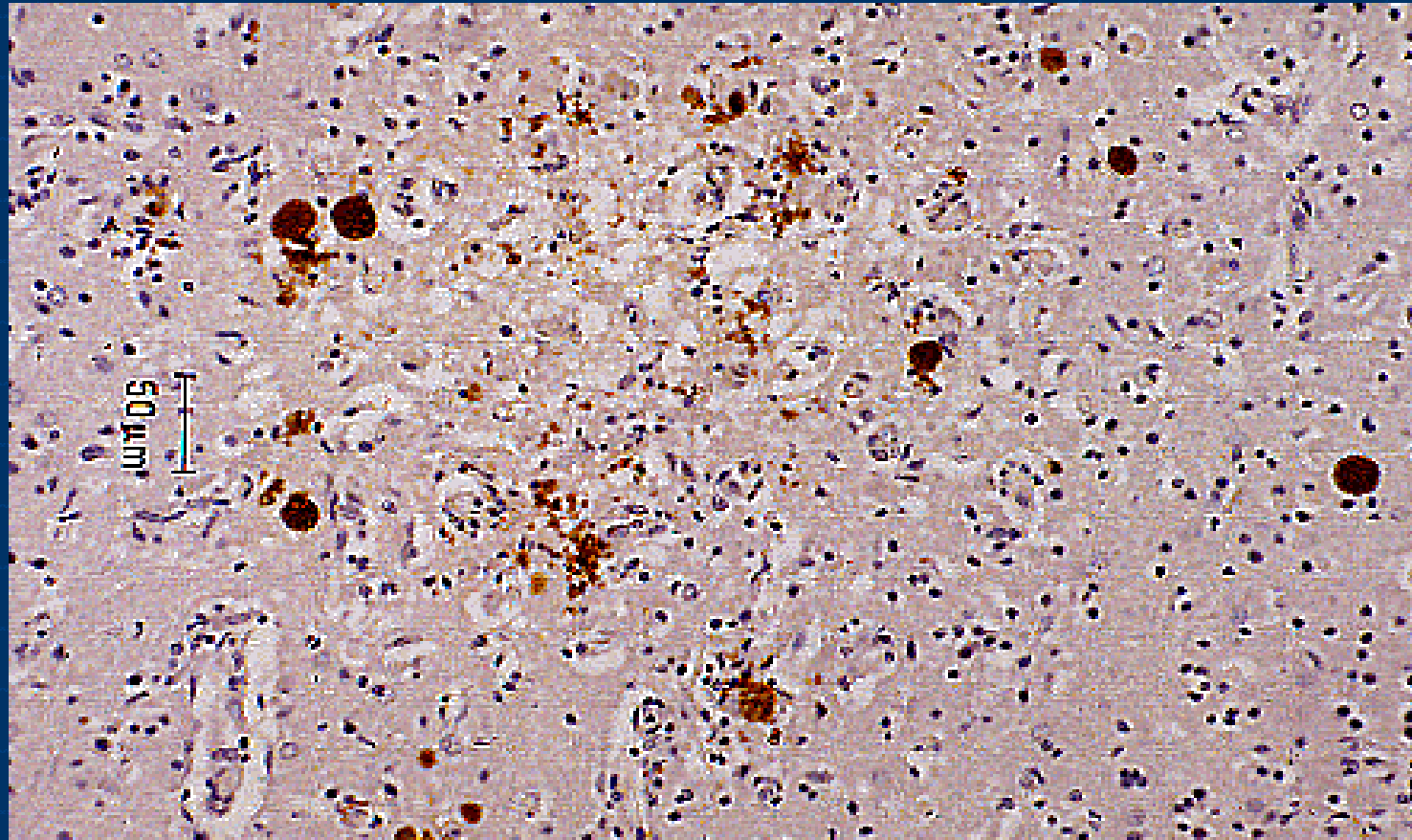
Pathology



Pathology



Pathology



Indications for Biopsy

- ◆ Controversial topic
- ◆ For HIV+ patient w/ multiple lesions – rec 10-14 day empiric toxo treatment
- ◆ Many recommend Bx for solitary lesion as 70% will be PCNSL
- ◆ Bx also recommended if patient is toxoplasma seronegative w/ single lesion

Prognosis and Treatment

- ◆ Role for surgical resection only in impending herniation
- ◆ Standard therapy is Pyrimethamine and Sulfadiazine w/ Leucovorin added to decrease bone marrow toxicity x 8 weeks
- ◆ Multiple side effects including crystalline nephropathy, interstitial nephritis, and rash
- ◆ Up to 50% are unable to tolerate
- ◆ Alternate therapies include Clindamycin, atovaquone, and azithromycin

Prognosis and Treatment

- ◆ Suppressive therapy (recommended for all patients w/ $CD4 < 100$) – Low dose Pyrimethamine + sulfadiazine
- ◆ Discontinuation of prophylaxis after 2 years w/ no viral load and $CD4 > 200$ has been successful
- ◆ Survival has markedly increased from 6-12 months in the pre-HAART era