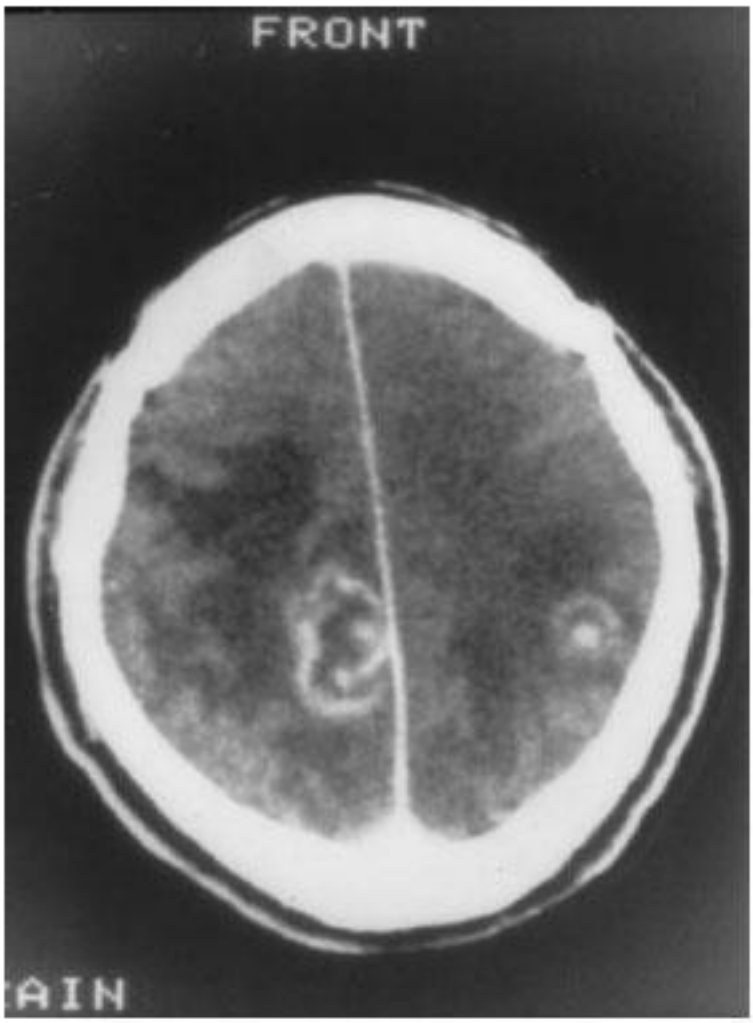
Question 47 – Infectious diseases

A 43 year old man presents with focal neurological signs.

Investigations show:

HIV antibody	Positive
CD 4+ cell count	10 cells/ μL [500-1500]
Plasma HIV RNA concentration (viral load)	250,000 copies/mL
Toxoplasmosis Ig G Ig M	 Negative Negative
Cytomegalovirus Ig G Ig M	 Positive Negative
Epstein Barr virus Ig G Ig M	 Postive Negative
Rapid plasma reagin (RPR)	Negative
CSF Microscopy Biochemistry Cryptococcal Antigen Polymerase chain reaction - JC virus - Epstein Barr virus - HIV viral load	 20 lymphocytes/ mm^3 0 polymorphs/ mm^3 0 red blood cells/ mm^3 Normal Negative Negative Positive 10,000 copies/mL

Year 2002 Paper two: Questions supplied by Jo

CT is shown opposite The most likely diagnosis is: A) Toxoplasmosis encephalitis B) Primary cerebral lymphoma C) Progressive multifocal leukoencephalopathy D) Cerebral bacterial abscess E) Cryptococcal meningitis	

Answer:

Learning issues:

1) HIV and AIDS defining illness (with CD 4+ counts at which each manifests)
2) Neurological complications of HIV
3) CTB appearances of common HIV cerebral complications

CD4 Count	Clinical features/ diseases	Neurological
> 500	Lymphadenopathy Recurrent vaginal candidiasis	CNS lesions that of immune competent - Brain tumours (benign and malignant) - Brain mets
200 – 500	Pneumococcal pneumonia Pulmonary TB Herpes zoster Oral candidiasis Cervical intra-epithelial neoplasis	HIV associated cognitive and motor disorders (but usually do not present with focal lesions)

	Kaposi sarcoma NHL Anaemia	
100 – 200	PCP (now incidence decreased due to prophylaxis) Wasting	HIV encephalopathy/ AIDS dementia complex CNS mass lesions getting more common as CD4 < 200
50 – 100	Toxoplasmosis Cryptococcosis	CNS mass lesions - Opportunistic infections - Primary CNS lymphoma
< 50	CMV retinitis MAC Cryptosporidiosis	Primary CNS lymphoma Progressive multifocal leukoencephalopathy (PML, from JC virus) CMV encephalitis

With the advent of HAART and prophylaxis
- Use of Bactrim for PCP prophylaxis also very effective for toxoplasmosis prophylaxis (decreased incidence from 72% to 18% from 1991 to 1996)
- HAART associated with declining incidence of HIV encephalopathy, primary CNS lymphoma and PML (though Harrison's states that PNL still occurs at some frequency despite this)
- However, HAART may be contributing to new demyelinating leukoencephalopathy

Imaging techniques
- MRI has many advantages: no radiation, more sensitive than CT in determining if lesion is truly solitary, greater sensitivity for white matter/ posterior fossa lesions
- Ancillary studies (more sensitive than specific)
- Thallium SPECT scan or PET : since thallium/glucose more avidly taken up by tumours, ddx between toxo lesion and primary CNS lymphoma
- Perfusion MRI: changes in cerebral blood flow to ddx toxo (less flow as less vessels in infected abscess) from lymphoma (more flow

CNS lesion with mass effect - oedema and mass effect - caution posterior fossa lesions as herniation can occur - usually **enhances** with contrast (local inflammation and breakdown of BBB)	**1) Toxoplasma encephalitis** - reactivation disease (thus Ig G positive) - usually **multiple** - parietal or frontal lobe, thalamus, basal ganglia or corticomedullary junction - **ring enhancement 90%** with oedema - uncommonly as diffuse encephalitis **2) Primary CNS lymphoma** - constitutional Sx 80% - **solitary and multiple lesions** occur at equal frequency - if solitary and **>4cm**, likely lymphoma - some degree of irregular **enhancement** but can look exactly like that of toxoplasmosis - usually corpus callosum or periventricular regions **3) TB (tuberculoma)**

	- in endemic areas **4) Abscesses** - eg staph, strep, salmonella, aspergillus, nocardia, syphilitic gumma etc - much less common than 1) & 2) - usually disseminated infection
CNS lesion with no mass effect - usually do not enhance - no risk of herniation	**1) PML** - **demyelinating** disease - by **JC virus reactivation** (acquired in childhood in 90%, no other known pathology) - **multifocal** areas of demyelination - not enhancing - **bilateral and asymmetrical** - usually **subcortical** rather than deep white matter **2) HIV encephalopathy** - classic triad of subcortical dementia: memory loss, depressive Sx, movement disorder - radiological features masquerade PML but tend to be **symmetrical** **3) CMV encephalitis** - **reactivation of CMV** - needs low counts <50 - delirium, confusion and focal neurology - very rarely causes ring enhancing lesions with oedema and mass effect - usually MRI: diffused micronodular or periventricular encephalitis