



# Diagnostic Slide Session, Case 2021-10

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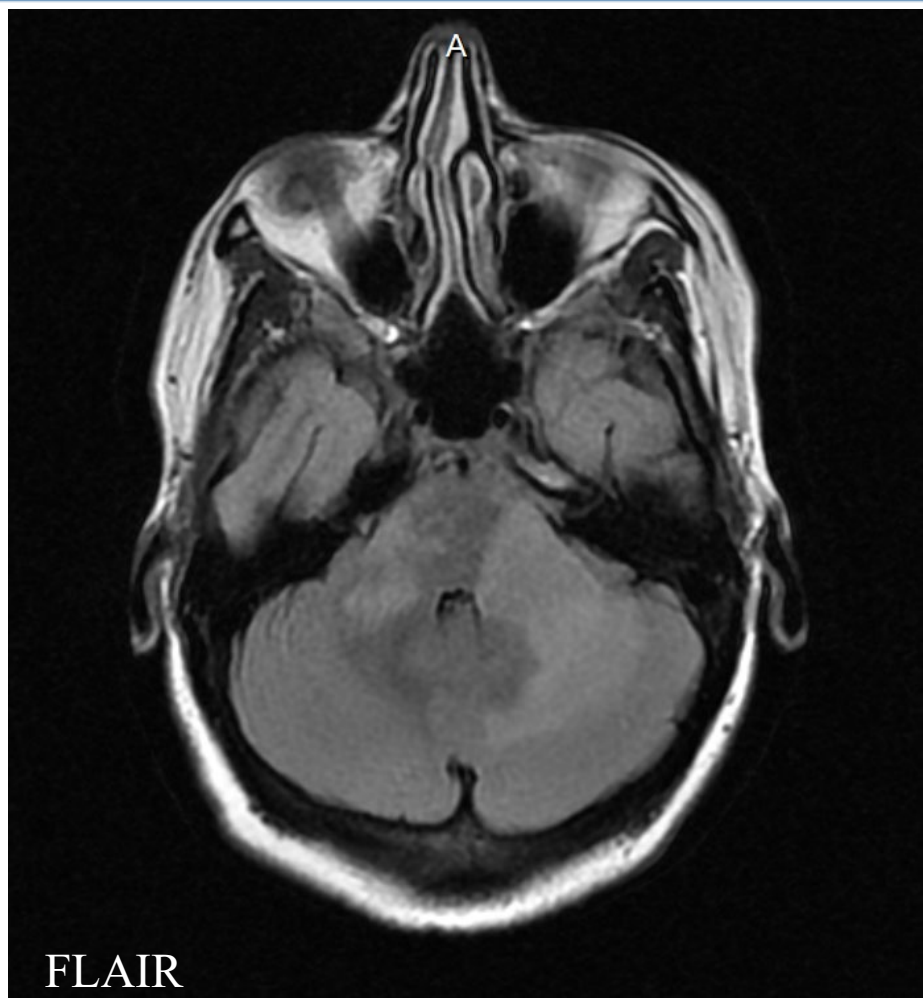
No disclosures or conflicts of interest

# Clinical history

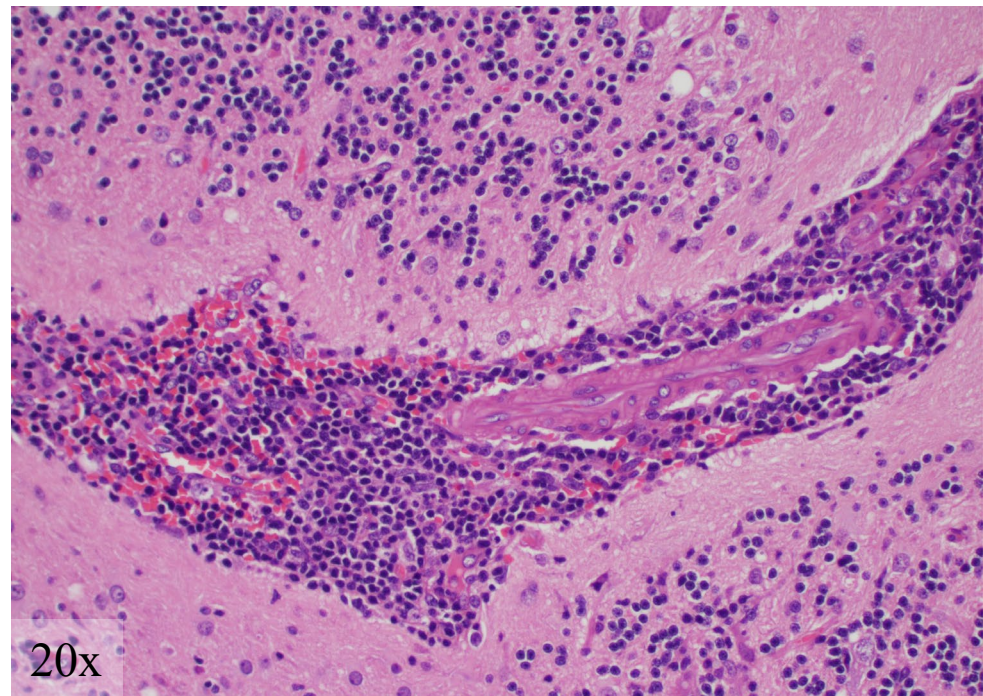
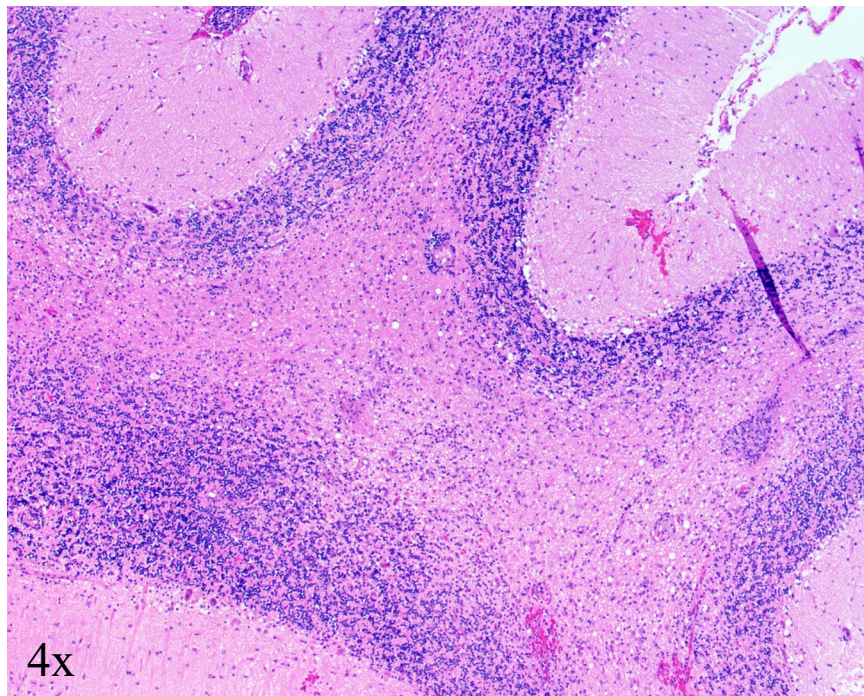
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- 47-year-old female
- HIV-positive
- Presents with generalized weakness, dizziness, mild incoordination

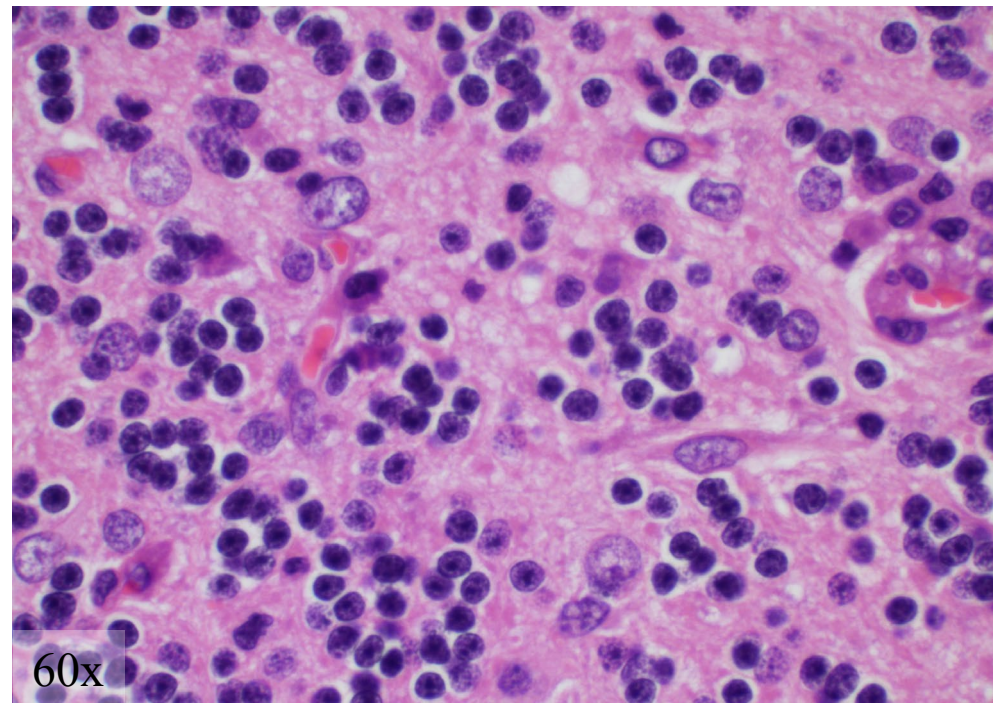
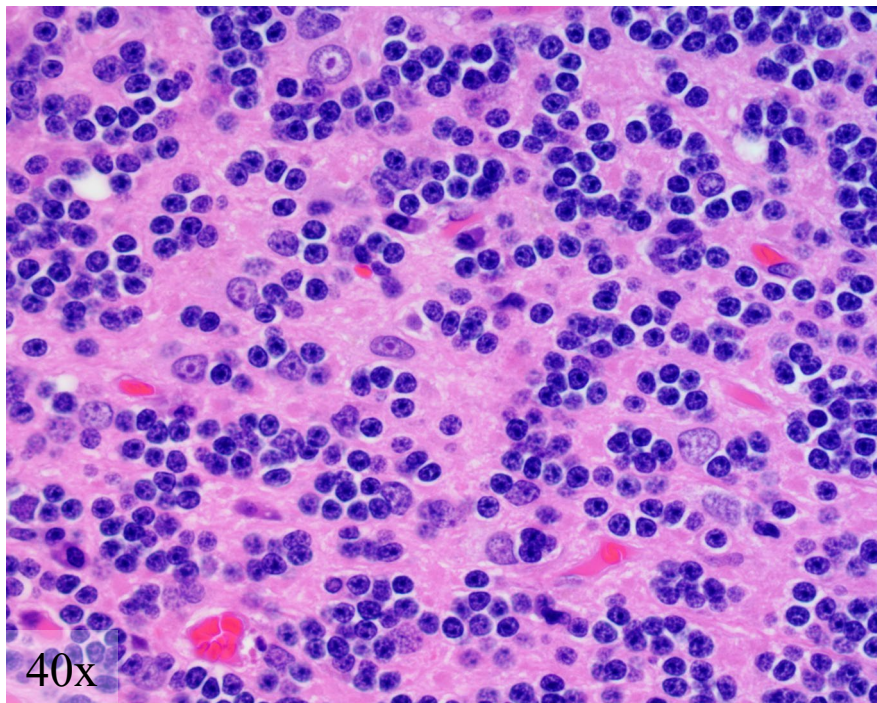
# Imaging



# Histology



# Histology



# Discussion

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- 1) Differential diagnosis
- 2) Pathogenesis

# Differential diagnosis

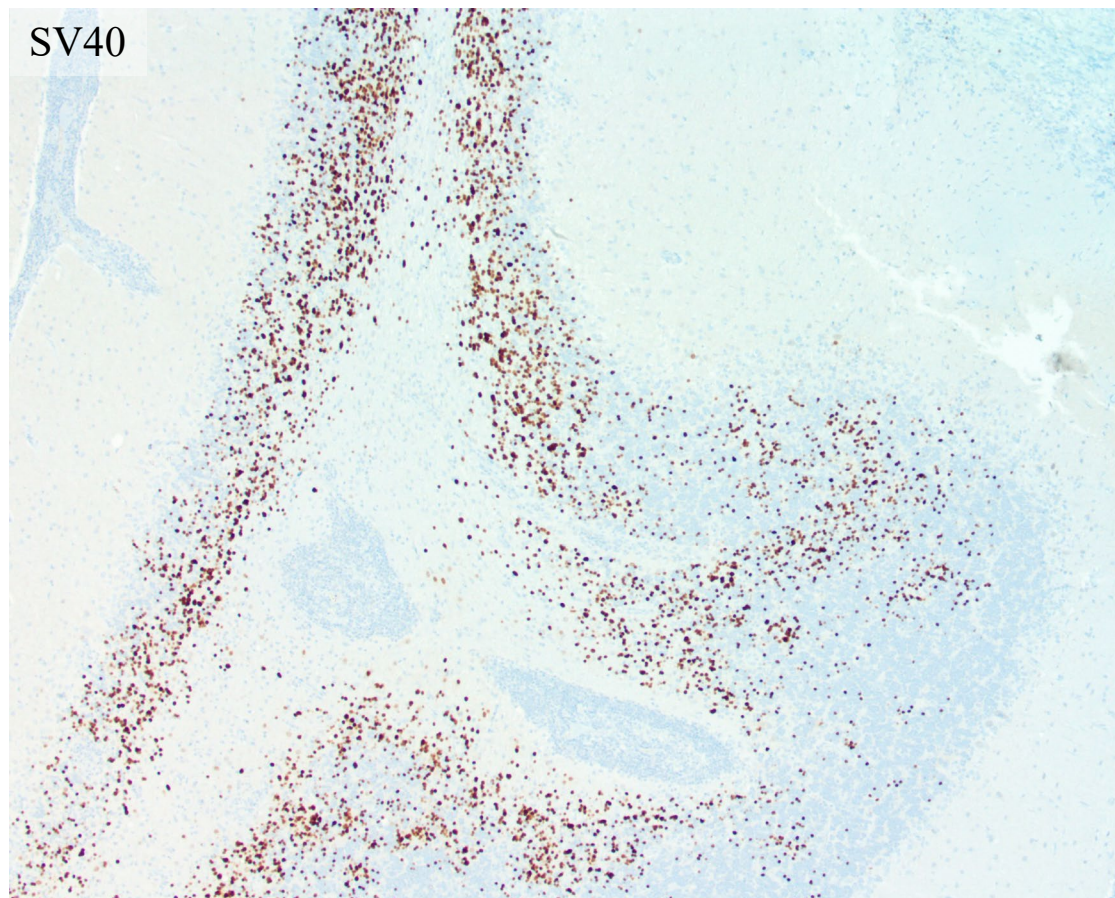
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- JCV granule cell neuronopathy
- Progressive multifocal leukoencephalopathy (PML)
- Lymphoma
- Infectious/Inflammatory

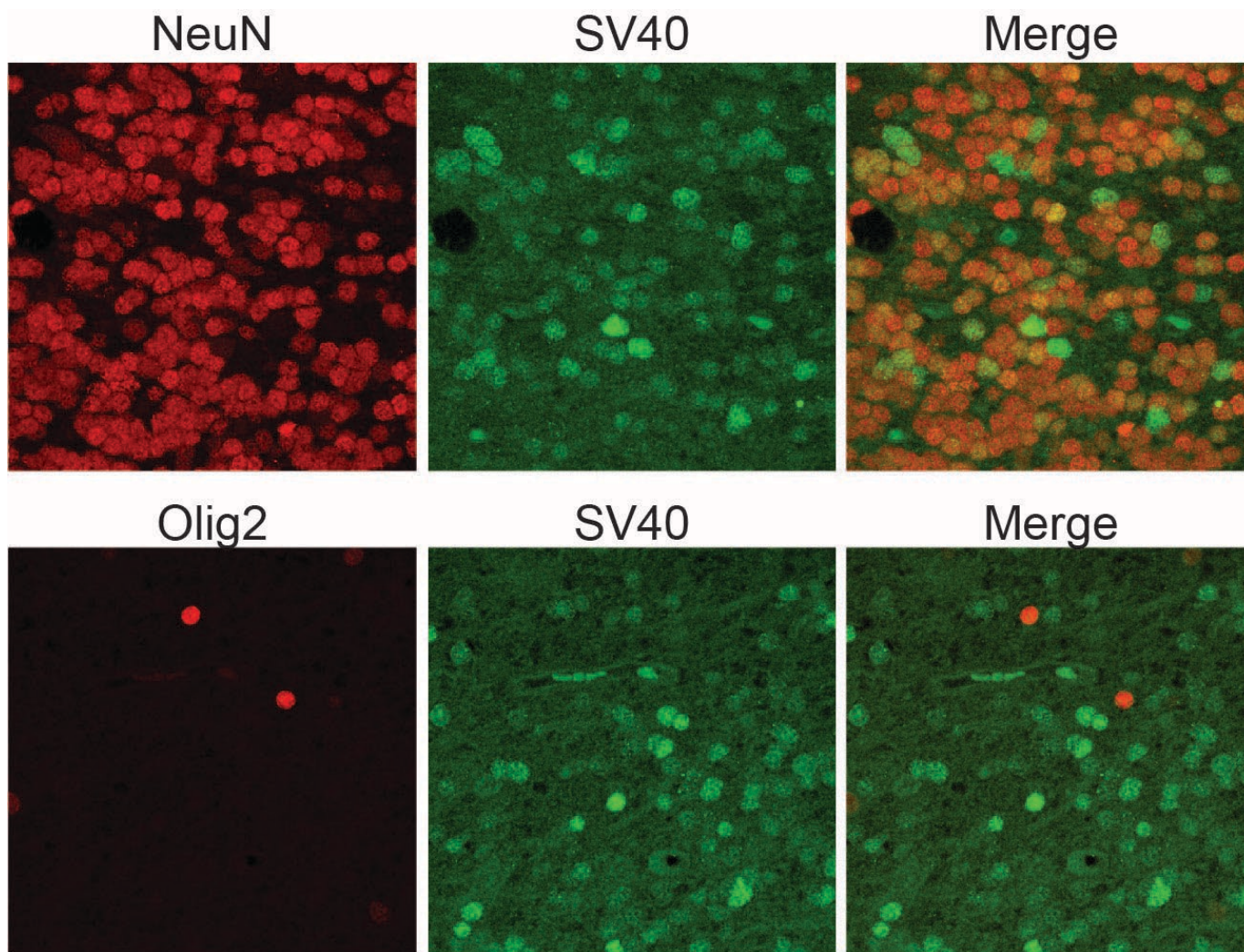


# Immunohistochemistry

- Inflammation is composed of B (CD20) and T (CD3) cells
- Rare p53 positive cells

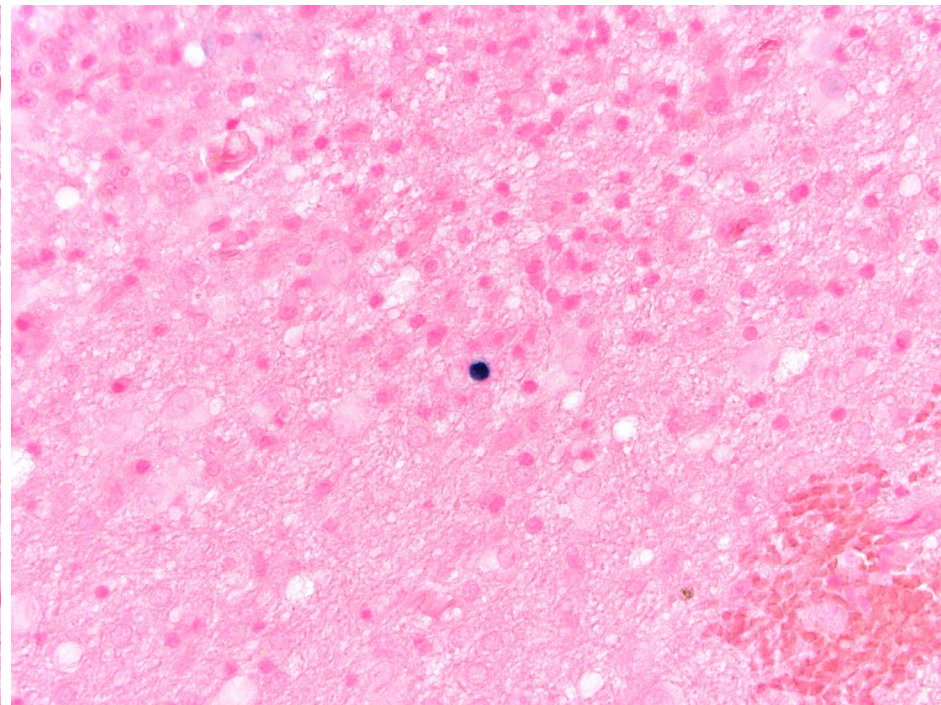
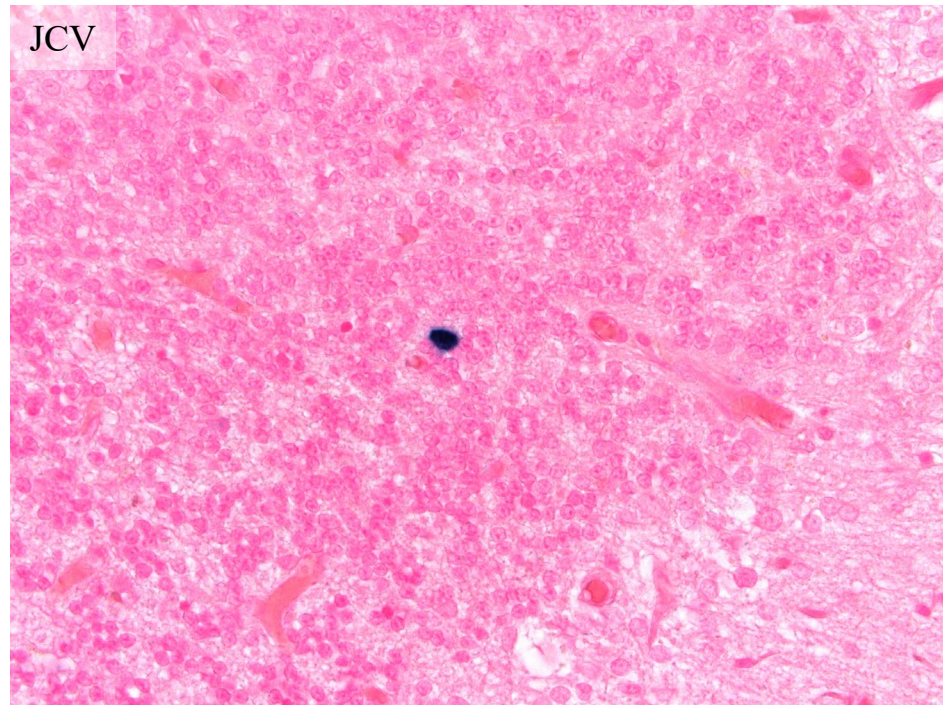


# Immunohistochemistry



# In situ hybridization

JCV



Courtesy of Caterina Giannini, MD, PhD

# Final Diagnosis

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Chronic inflammation and JC virus granule cell neuronopathy.

# Overview of JCV neuropathology

## JC virus infection

- Ubiquitous human viral pathogen
- Impaired cellular immunity can lead to reactivation and pathology

## Spectrum of JCV-associated neuropathology

- WM oligodendrocytes and astrocytes → PML
- Cerebellar granule cell neurons → JCV granule cell neuronopathy
- Cortical pyramidal neurons → JCV encephalitis
- Leptomeninges → JCV meningitis

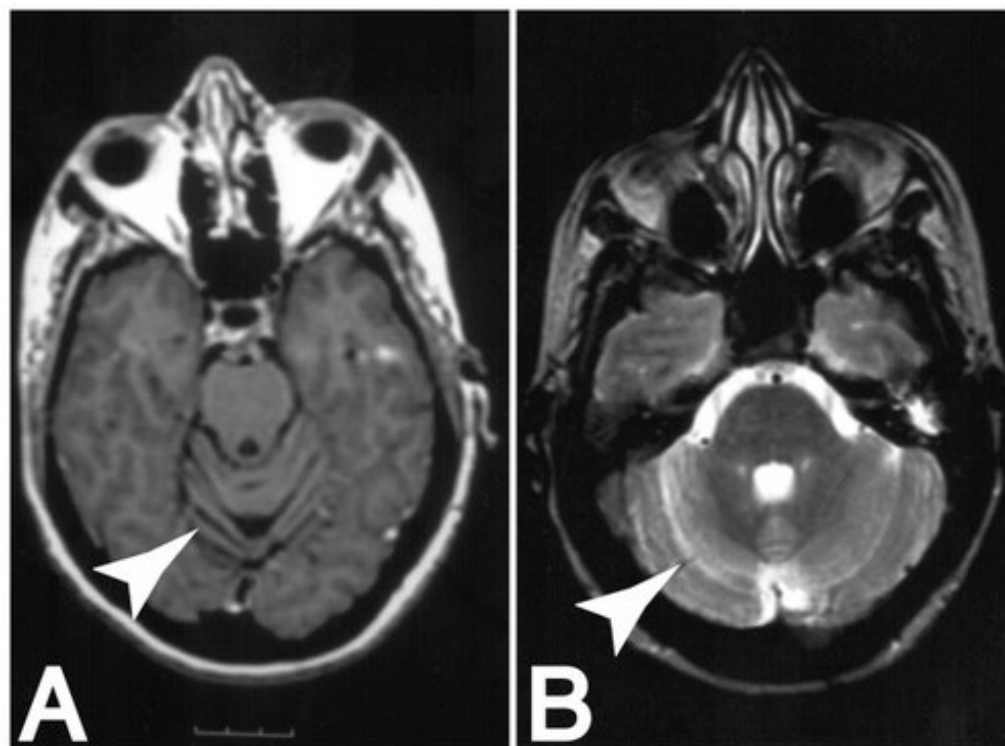
# JCV granule cell neuronopathy (JCV GCN)

## Clinical presentation

- Immunocompromised
- Ataxia, dysarthria

## Typical MRI findings

- T2/FLAIR: confluent hyperintensities in cerebellum and cerebellar peduncles
- Non-enhancing
- Bilateral, diffuse cerebellar atrophy



## Ancillary Studies

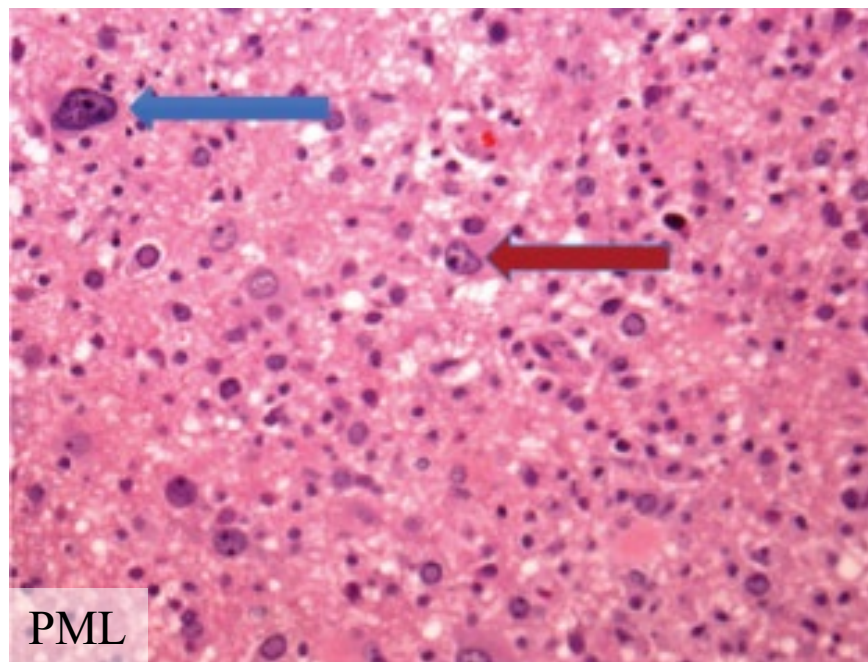
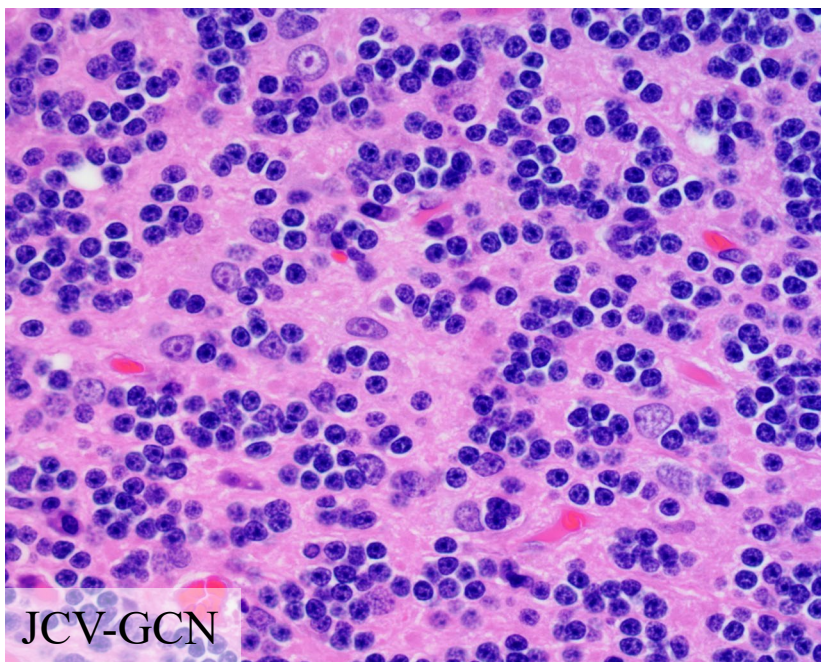
- CSF viral genotyping

Koralnik IJ *et al.* Ann Neurol. 2005 Apr;57(4)

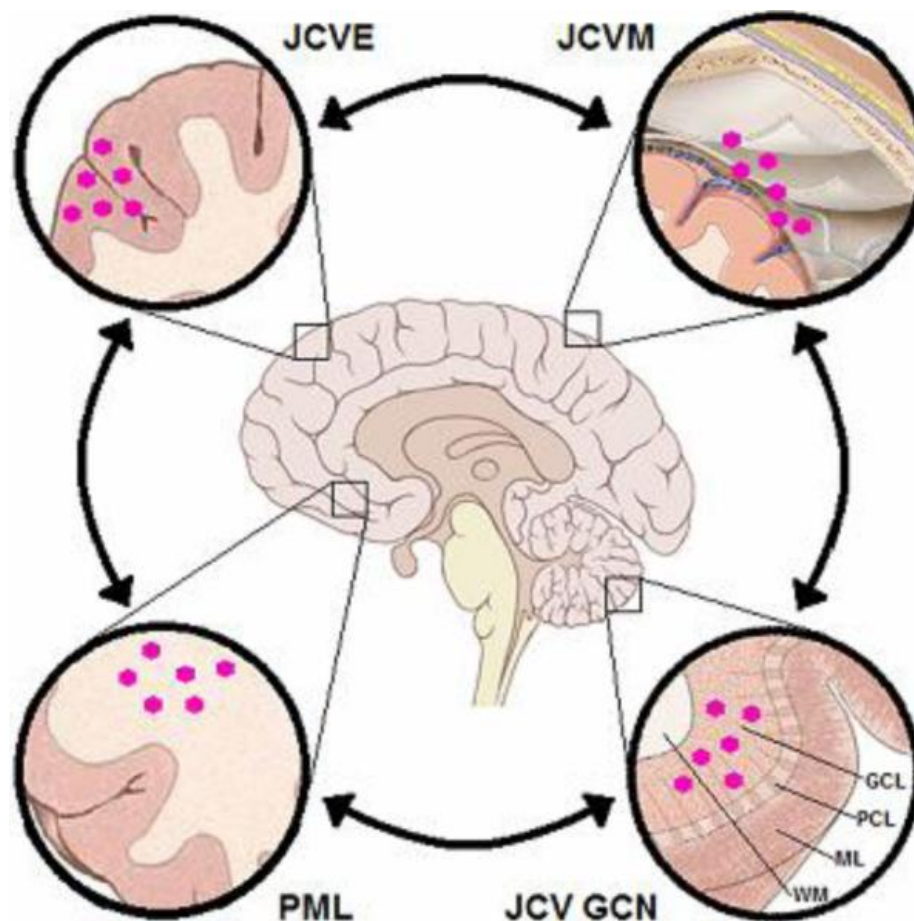
# JCV granule cell neuronopathy (JCV GCN)

## Histology

- Focal loss of internal granule cell neurons
- Enlarged, hypochromatic granule cell nuclei
- Spares Purkinje cells



# The spectrum of JCV-associated neuropathology



Miskin DP and Koralnik IJ. *Curr Opin Neurol.* 2015;28(3)



# Summary of JCV-GCN

- Immunosuppressed patients
- Clinical history of incoordination
- Radiographic evidence of cerebellar atrophy +/- T2/FLAIR hyperintensities
- Focal granule cell neuron loss with scattered granule cell neurons with enlarged nuclei
  - Confirmed with ancillary tests to demonstrate JCV infection of granule cell neurons
- May occur in isolation or concomitant with PML or other JCV-associated neuropathology

# References

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# Thank you

## JHH Neuropathology

- Charles Eberhart
- Meaghan Morris
- David Nauen
- Stephen Nix
- Fausto Rodriguez
- Juan Troncoso

