



# Oligodendroglioma

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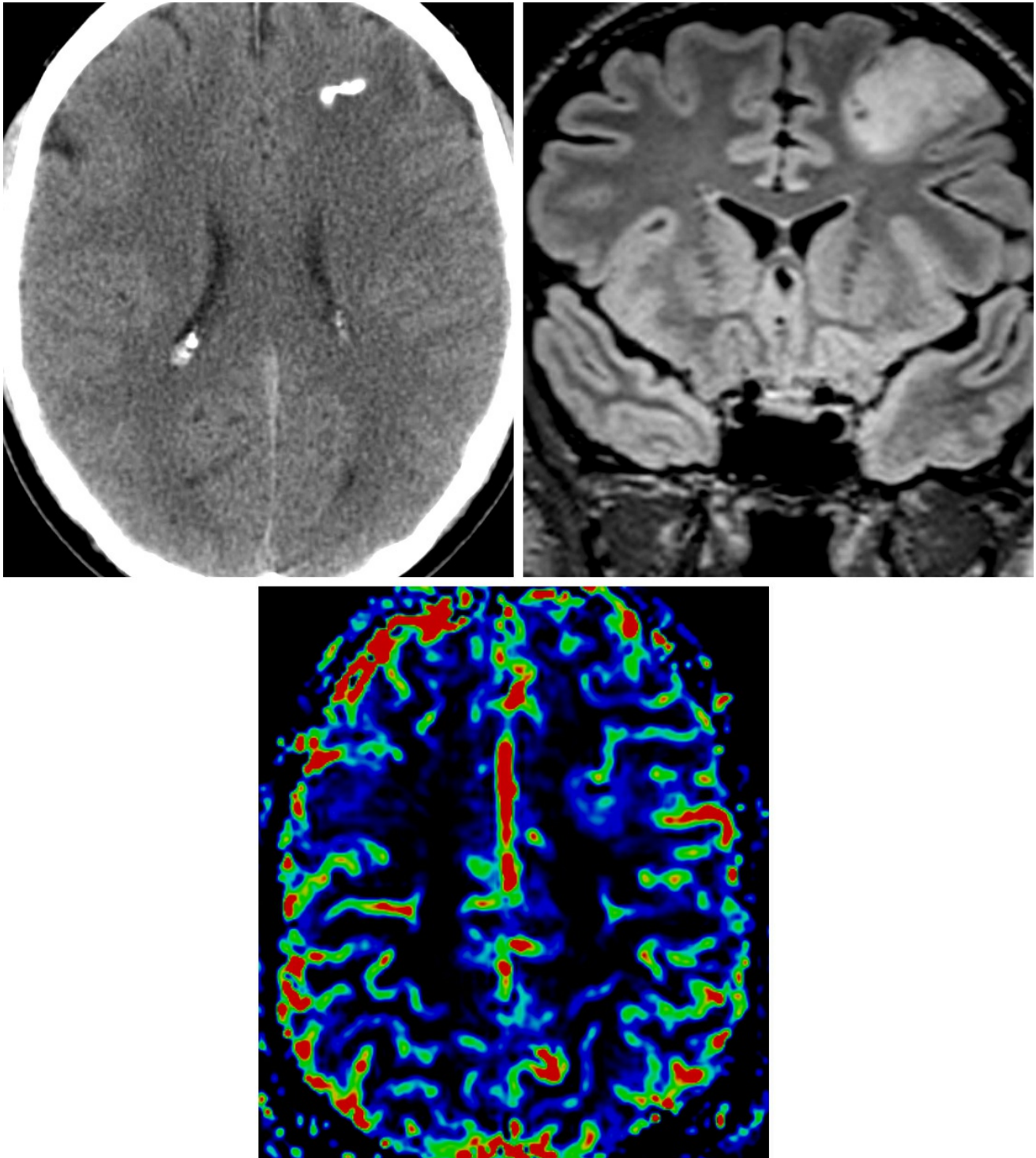


Figure 1: (Top Left) This oligodendroglioma has internal coarse calcification on CT imaging that is very typical of this type of tumor. (Top Right) A coronal FLAIR image demonstrates typical fairly circumscribed

permeative involvement of cortex and adjacent white matter. (Bottom) The mild hyperperfusion on this CBV image is also seen fairly often in oligodendrogliomas due to the pathologic feature of "chicken-wire" vascularity.

## BASIC DESCRIPTION

- Slow-growing and infiltrating cortical/subcortical glial tumor

## PATHOLOGY

- WHO grade II
- Anaplastic oligodendrogliomas are WHO grade III
- Arises from malignant transformation of mature oligodendrocytes or glial precursor cells
- Calcification and cystic degeneration common
- "Fried-egg" microscopic appearance due to rounded nuclei and clear cytoplasm
- Genetics by WHO 2016 classification: IDH mutant, ATRX wild type, and 1p/19q codeleted

## CLINICAL FEATURES

- Typically occur during fifth to sixth decades of life
- Slight male gender predilection
- Presenting symptoms: seizures, headaches, and focal neurologic deficits
- Median survival, 10 years
  - Better prognosis than for astrocytomas of same WHO grade

## IMAGING FEATURES

- General
  - Well-marginated but infiltrating cortical/subcortical mass

- Usually supratentorial location
  - Frontal lobe >> temporal, parietal, and occipital lobes
- Cystic and solid tumor components can be present in variable degrees
- Calcification present in 40% to 80%
- Usually minimal to no peritumoral edema
- Oligoastrocytomas are less common but have an appearance very similar to that of oligodendrogliomas of the same WHO grade
- CT
  - Hypodense to isodense supratentorial mass involving the cortex and subcortical white matter
  - Hyperdense foci if hemorrhage or calcification is present
  - Variable enhancement on contrast-enhanced CT imaging
- MRI
  - T1WI: heterogeneous, hypointense to isointense relative to gray matter; ±adjacent cortical involvement with expansion
  - T2WI: heterogeneously hyperintense due to hemorrhage, cystic degeneration, and calcification
  - FLAIR: heterogeneously hyperintense, minimal peritumoral edema
  - T2\*/GRE/SWI: black signal blooming secondary to calcification and/or hemosiderin deposition from blood products
  - DWI: usually does not show restricted diffusion
  - T1WI+C: heterogeneous enhancement; new enhancement in WHO II tumors suggests malignant degeneration to anaplastic oligodendroglioma
  - MRS/MR perfusion: elevated choline, decreased NAA, absent lipid/lactate peak (unlike anaplastic oligodendroglioma); unique characteristic of elevated relative cerebral blood

volume (rCBV) despite lower grade due to pathologic feature of “chicken-wire vascularity”

## IMAGING RECOMMENDATIONS

- MRI with contrast including T2\*/GRE/SWI, CT for demonstration of calcification

For more information, please see the corresponding chapter in [Radiopaedia](#).

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