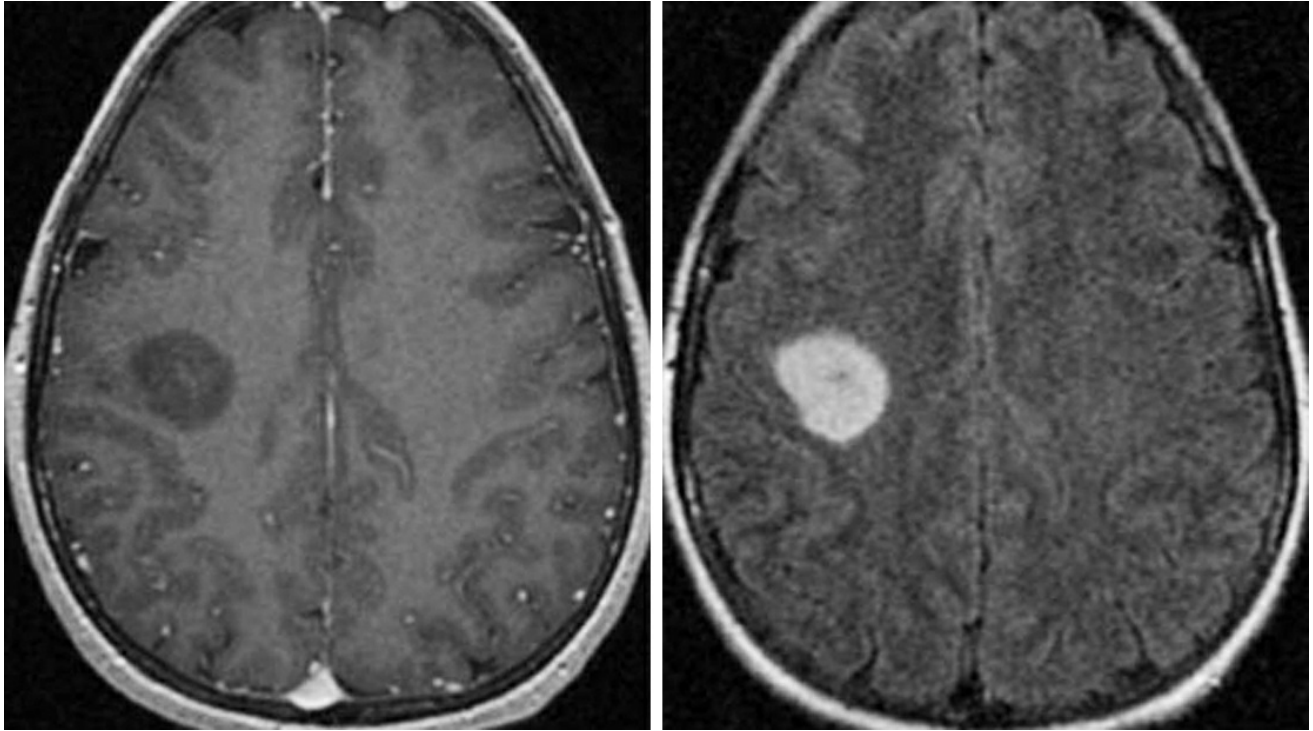




## Low-Grade Diffuse Astrocytoma

*Last Updated: April 27, 2021*



**Figure 1: T1-weighted postcontrast (left) and axial FLAIR (right) images demonstrate a fairly circumscribed infiltrative lesion involving the cortex and white matter. This low-grade tumor is associated with no appreciable enhancement.**

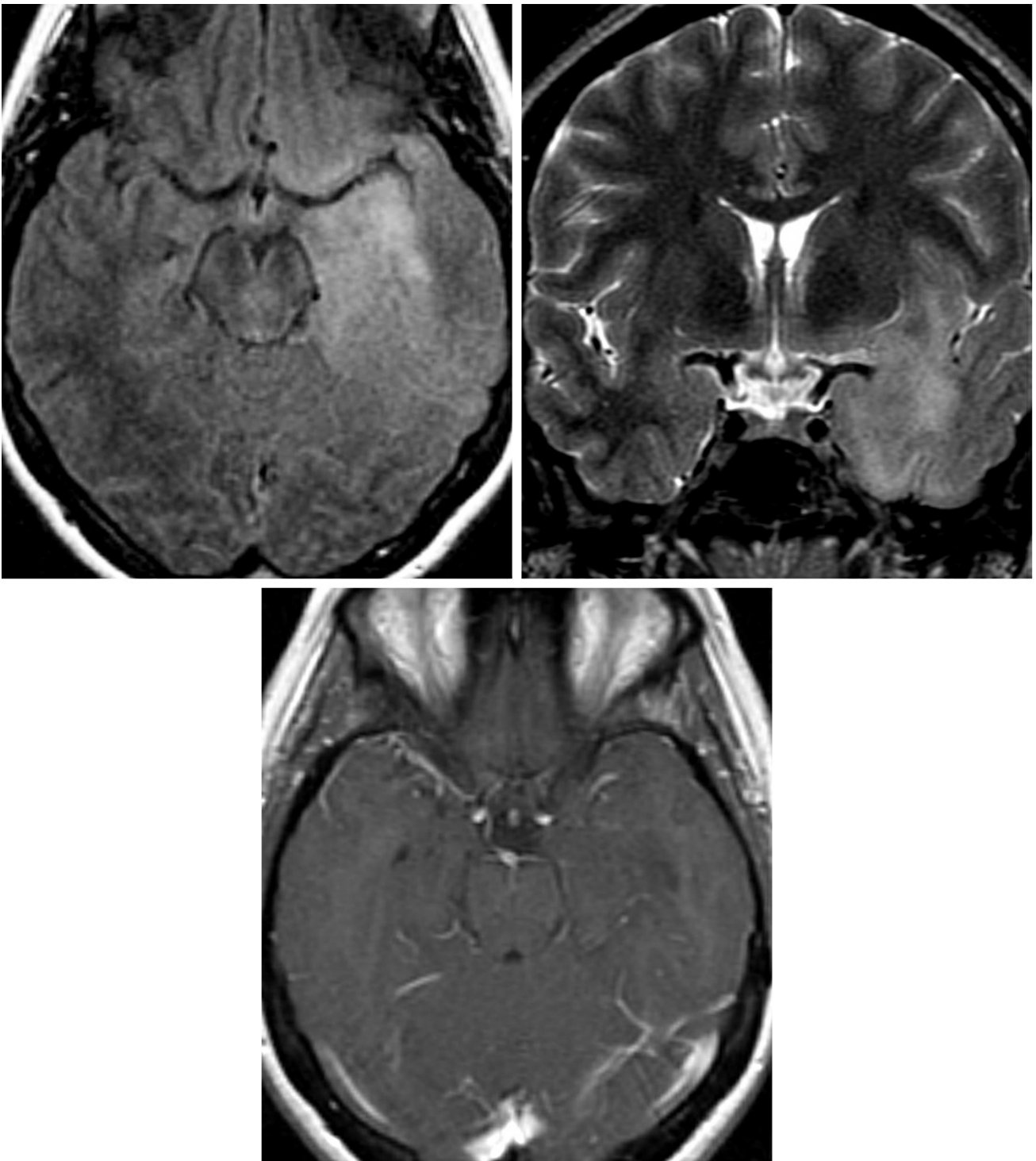


Figure 2: Axial FLAIR (top left) and coronal STIR (top right) images demonstrate a poorly defined infiltrative, hyperintense lesion involving the left temporal lobe, left insula, and inferior left frontal lobe. (Bottom) T1WI after contrast administration shows no contrast enhancement of this low-grade astrocytoma.

## BASIC DESCRIPTION

- Primary tumor arising from well-differentiated astrocytes

## PATHOLOGY

- WHO grade II
- Well differentiated, infiltrating, slow growing
- Malignant degeneration into [anaplastic astrocytoma](#) is common

## CLINICAL FEATURES

- Commonly presents with seizures
- Average patient age, 34 years (20–45 years)
- Median survival, 6–10 years
  - Survival greater in younger patients, gross-total resection, IDH1-, ARTX-, and MGMT-positive tumors
  - Pontine tumors are associated with decreased survival
- Sometimes associated with Li-Fraumeni syndrome and Ollier disease

## IMAGING

- General
  - Infiltrating, focal, or diffuse white matter mass that distorts normal architecture
  - Variable size; frontal lobe masses can be large at presentation
  - Tumor commonly extends beyond region of signal abnormality
    - Expansion of involved cortex
  - Two-thirds are supratentorial; frontal lobe involvement is most common
  - One-third are infratentorial; brainstem is most common, cerebellum is uncommonly involved
  - Majority do not enhance
    - Greater degree of enhancement suggests malignant degeneration
  - ±Cysts, calcification (20%)
- CT

- Hypodense to isodense, poorly defined, homogenous mass
- ±Calcification
- Little to no enhancement on contrast-enhanced CT imaging
- MRI
  - T1WI: homogeneously hypointense
  - T2WI: homogeneously hyperintense
  - FLAIR: homogeneously hyperintense
  - DWI: no restricted diffusion
  - T1WI+C: little to no enhancement; greater degree of enhancement suggests higher WHO grade
  - MR perfusion: low relative cerebral blood volume (rCBV) relative to anaplastic astrocytoma (AA) and [glioblastoma multiforme](#) (GBM); typically, the rCBV ratio to normal white matter is <1.8
  - MRS: mildly elevated choline, mildly depressed N-acetyl aspartate (NAA) peaks and usually no appreciable lactate peak

## IMAGING RECOMMENDATIONS

- MRI with contrast; consider MR perfusion for equivocal cases

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

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