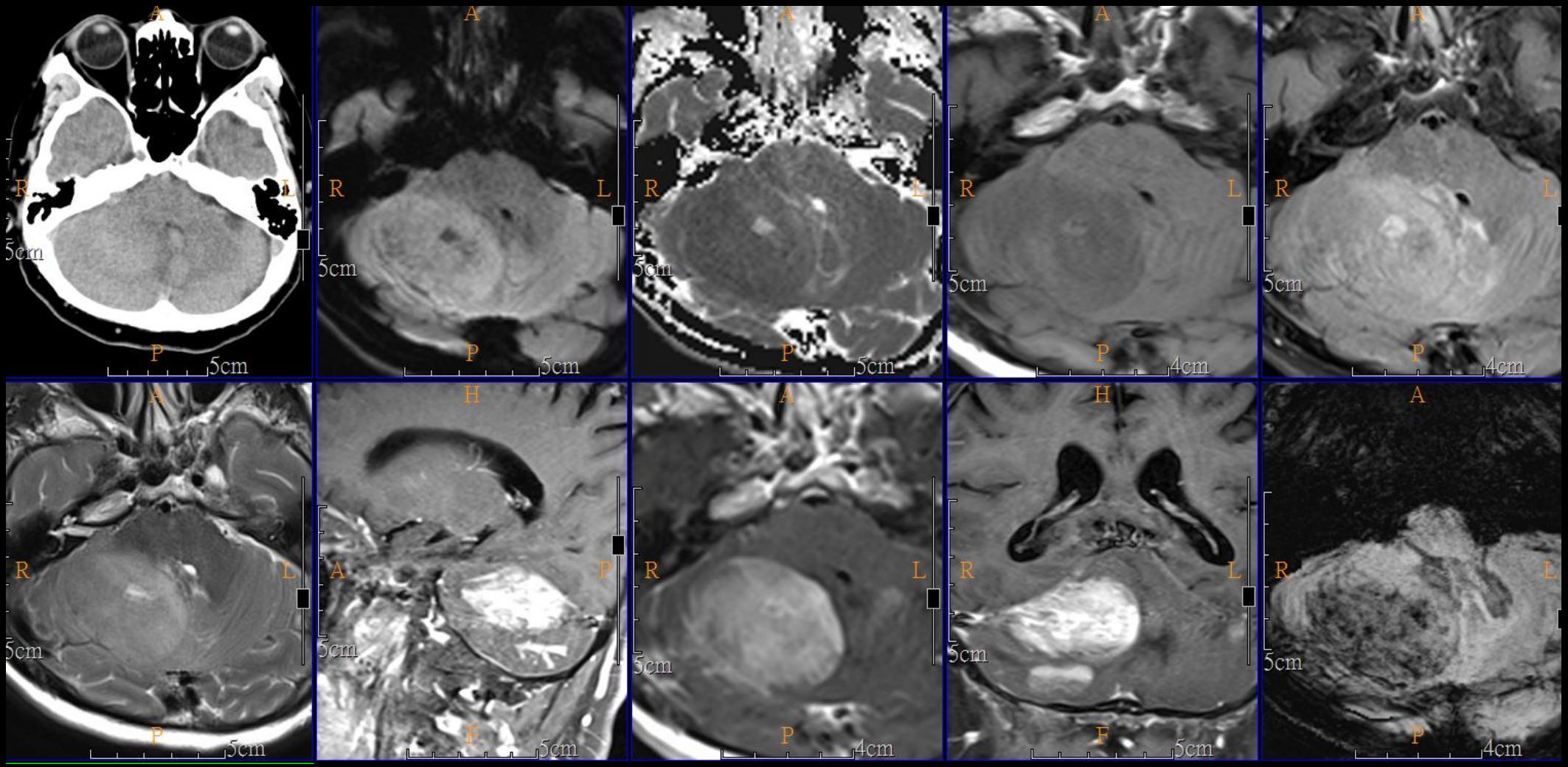
Case 4

Patient Profile

- 68 years old, male
- Chief complaint
  - Headache and dizziness for 1 day
- Past history
  - Unknown

Image

- 2018-08-31 Brain CT
- 2018-09-06 Brain MRI


A
R
L
P
5cm
H
F
4cm

Clinical Course

- Underwent suboccipital craniectomy with removal of tumor

- Pathology
  - Cerebellum, right, tumor removal, diffuse large B-cell lymphoma
  - Marker Expression
    CD3 -
    CD10 +
    CD20 +
    BCL2 +
    BCL6 +
    Ki-67 80%

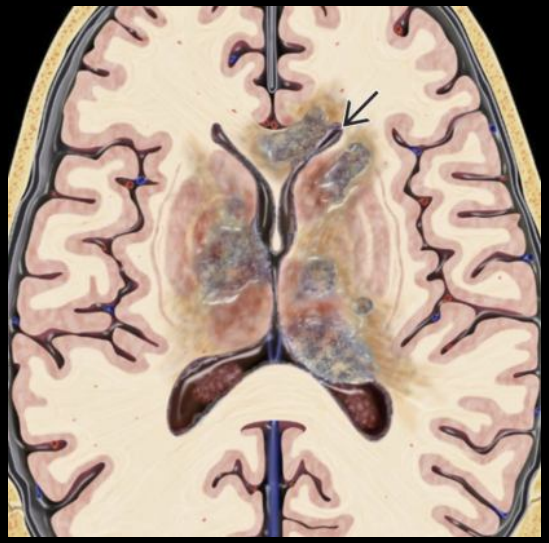
Discussion

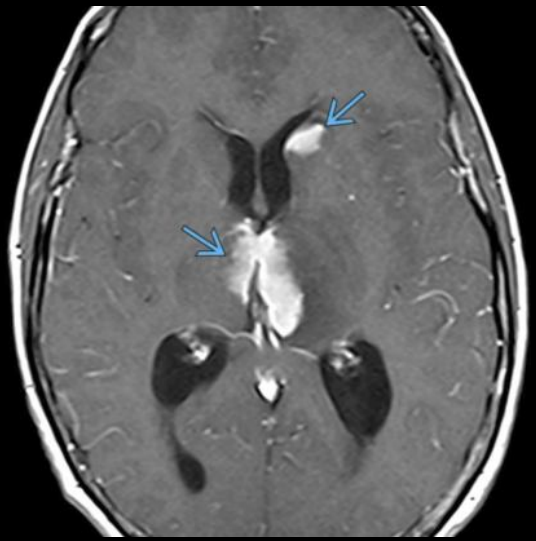
Primary CNS lymphoma

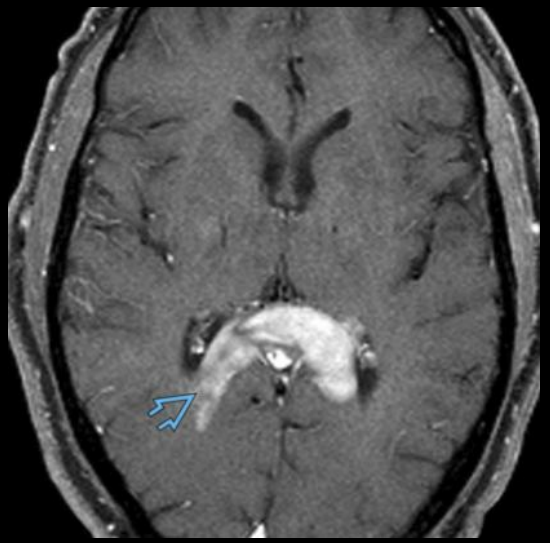
Primary CNS lymphoma with hemorrhage

Primary CNS Lymphoma

- Best diagnostic clue: Enhancing lesion(s) within basal ganglia &/or periventricular white matter
- 60-80% supratentorial
  - Often involve, cross corpus callosum
  - Frequently contact, extend along ependymal surfaces
- Classically hyperdense on CT (helpful for diagnosis)
- Diffusely enhancing periventricular mass in immunocompetent
- May see hemorrhage or necrosis in immunocompromised
- DWI: Low ADC values
- Periventricular location and subependymal involvement
- Corpus callosum involvement may be seen with PCNSL, glioblastoma (GBM), and rarely metastases or demyelination







research article

Primary central nervous system lymphoma: is absence of intratumoral hemorrhage a characteristic finding on MRI?

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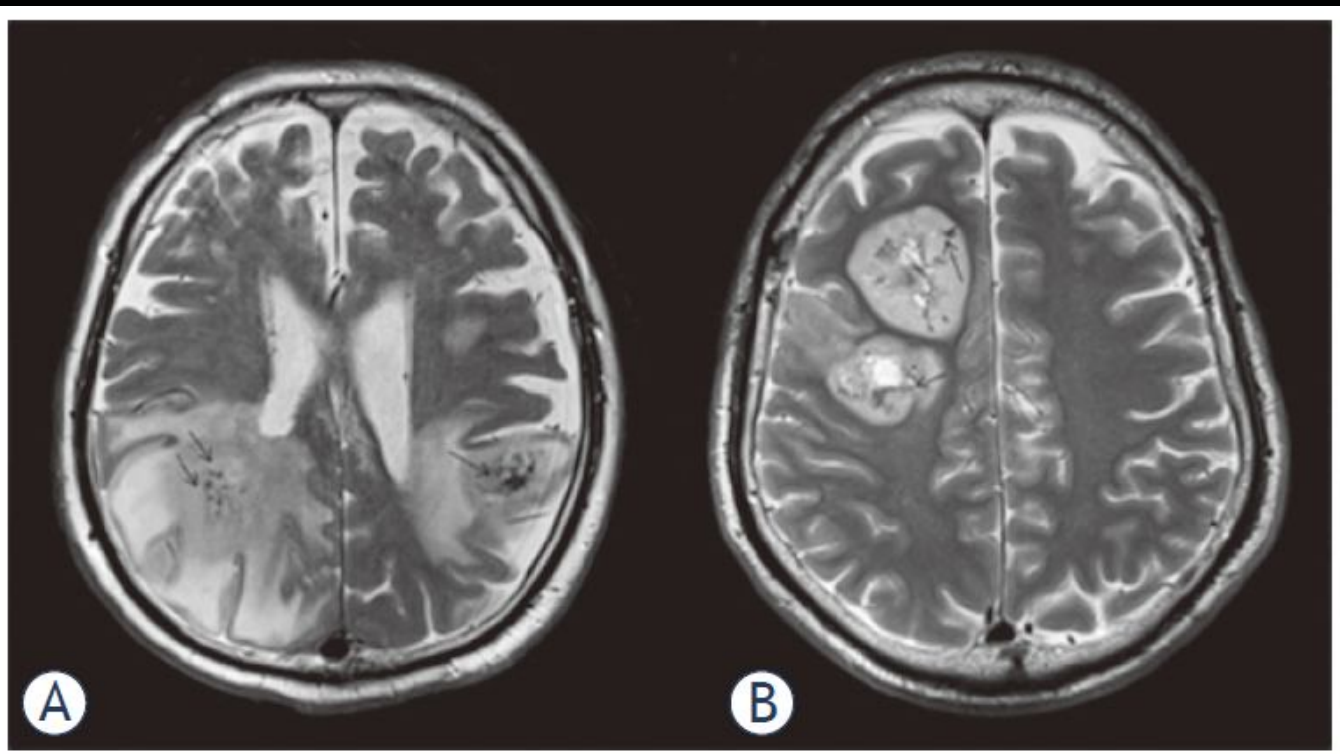
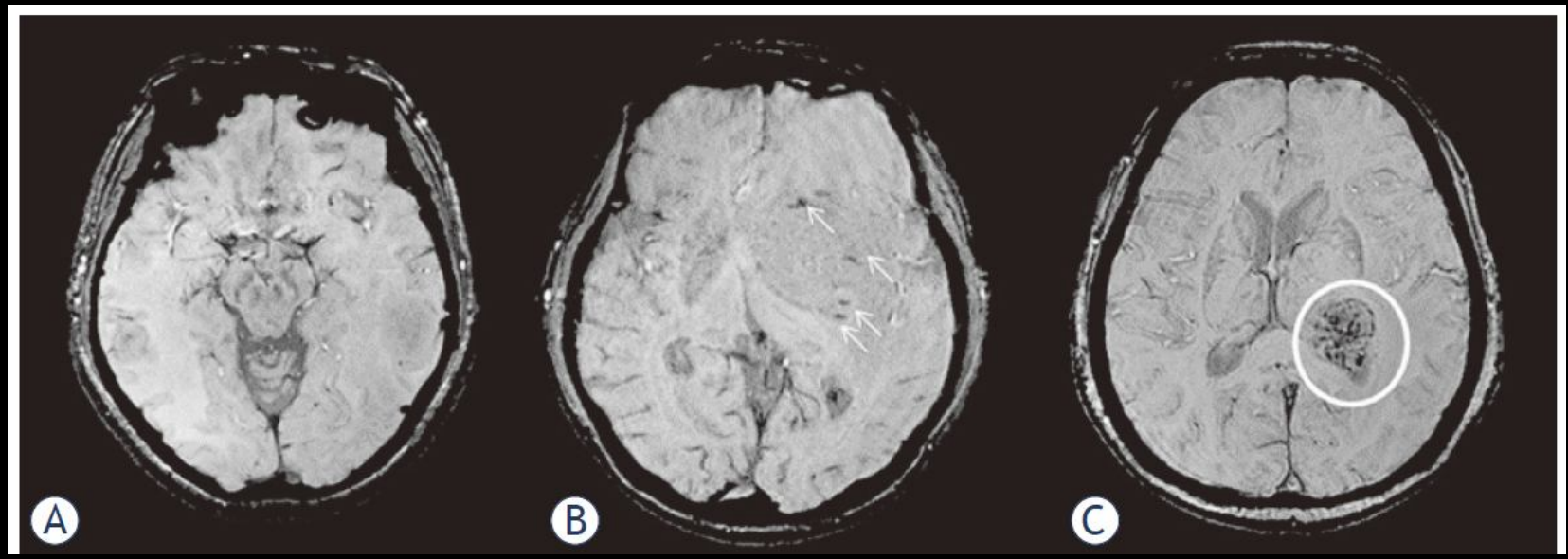


FIGURE 1. Gross intratumoral hemorrhage (arrows) in primary central nervous system lymphoma **(A)** and glioblastoma multiforme **(B)** on T2-weighted image. Both cases show low-intensity areas representing intratumoral hemorrhage.



(A) Grade 1: multifocal tumors in bilateral temporal lobes show no intratumoral susceptibility signal on susceptibility-weighted imaging (SWI).
(B) Grade 2: tumor in the left basal ganglia shows punctate low-intensity signals (arrows) on SWI.
(C) Grade 3: tumor in the left thalamus shows multiple linear or nodular low intensity signals (circle) on SWI.

TABLE 1. Gross intratumoral hemorrhage (GITH) frequency in primary central nervous system lymphoma (PCNSL) and glioblastoma multiforme (GBM)

Pathological Diagnosis	GITH	
	Negative (%)	Positive (%)
PCNSL	15 (79)	4 (21)
GBM	23 (59)	16 (41)

TABLE 2. Intratumoral susceptibility signal (ITSS) grading of primary central nervous system lymphoma (PCNSL) and glioblastoma multiforme (GBM)

Pathological Diagnosis	ITSS grading		
	Grade 1 (%)	Grade 2 (%)	Grade 3 (%)
PCNSL	9 (47)	6 (32)	4 (21)
GBM	4 (10)	9 (23)	26 (67)

TABLE 3. Enhancement patterns of primary central nervous system lymphoma (PCNSL) and glioblastoma multiforme (GBM)

Enhancement pattern	Pathological Diagnosis	
	PCNSL	GBM
Non-necrotic	15	2
Necrotic	3	37

Conclusion

- Low intratumoral susceptibility signal grades can differentiate primary central nervous system lymphoma from glioblastoma multiforme
- However, specificity in this study was relatively low, and primary central nervous
- system lymphoma cannot be excluded based solely on the presence of an intratumoral susceptibility signal

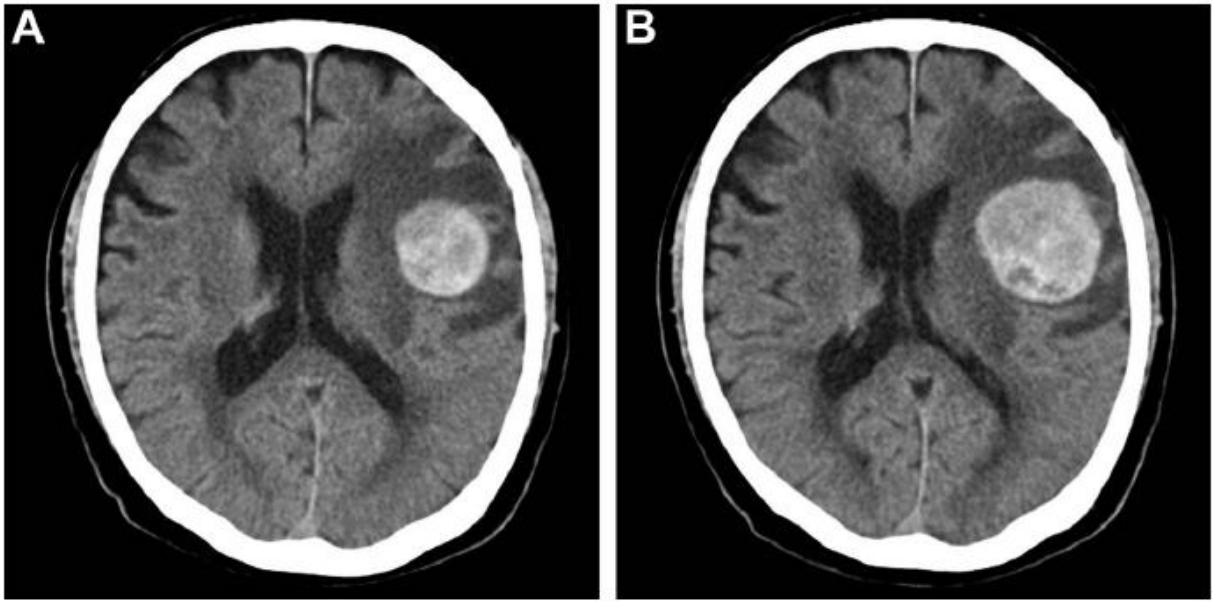


Figure 1. (**A**) Initial computed tomography (CT) showing a round, high-density mass with surrounded vasogenic edema at the left frontal lobe. (**B**) Follow-up CT performed 2 weeks after onset shows that the high-density lesion and surrounding edema have increased in size compared with previous images.

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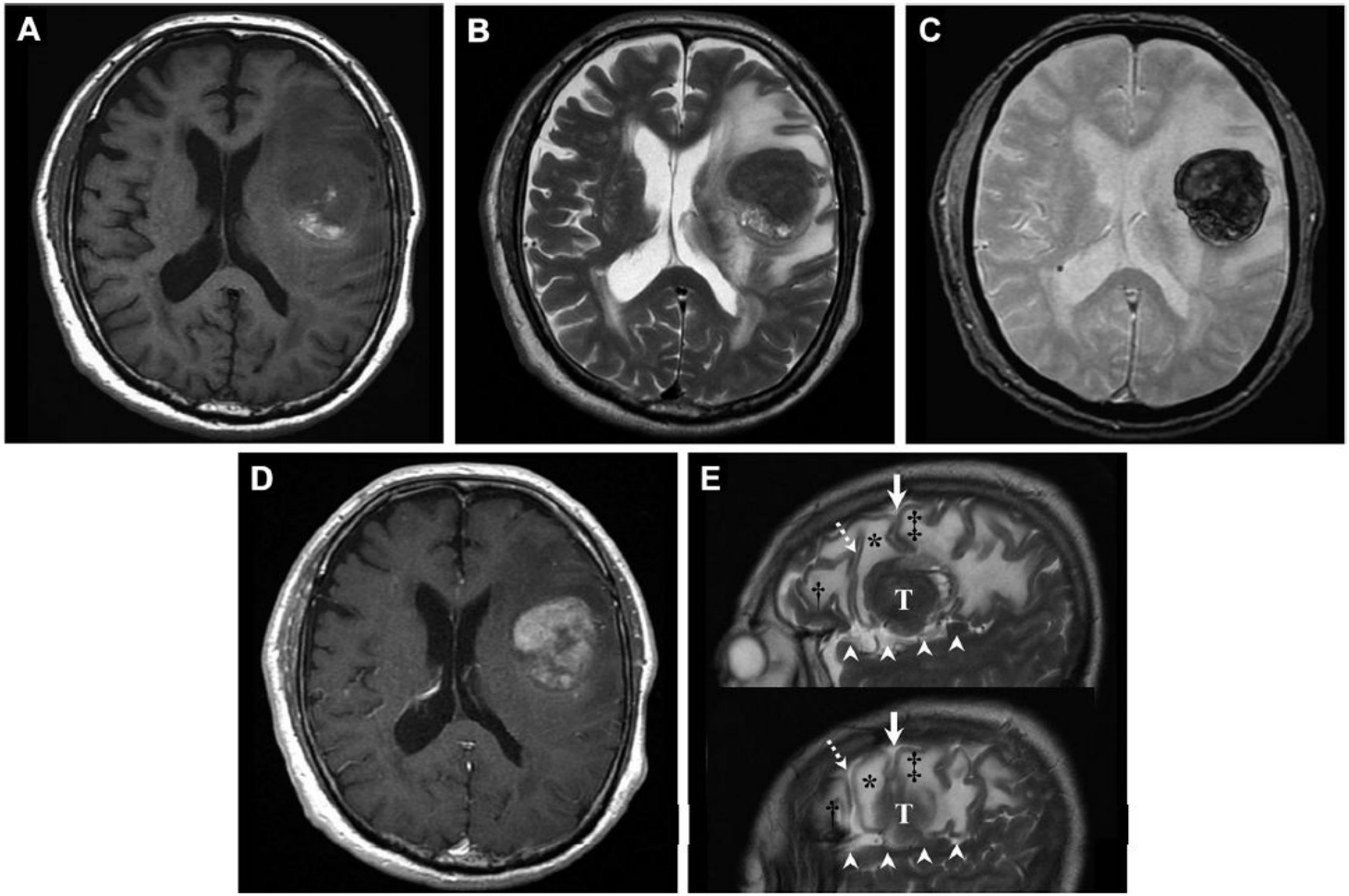

Figure 2. Magnetic resonance (MR) image shows (**A**) a round, isointense area with focal hyperintensity on axial T1-weighted imaging (T1WI); (**B**) a round, low-intensity area with focal hyperintensity on the axial T2-weighted imaging (T2WI); and (**C**) a well-demarcated, round, low-intensity area in the left frontal lobe on axial T2*-weighted imaging. (**D**) Axial T1WI with contrast medium shows a mass lesion with heterogeneous enhancement in the left frontal lobe. (**E**) Sagittal T2WI shows a tumor (T) and relationships to the inferior precentral sulcus (*white arrow*), ascending ramus of the lateral sulcus (*white dotted arrow*), pars opercularis of the inferior frontal gyrus (*), precentral gyrus (‡), pars triangularis of the inferior frontal gyrus (†), and sylvian fissure (*white arrowheads*).