Supplementary Table 1. MRI Acquisition Protocol

Pulse sequence	
CE-T1WI	
Repetition time (ms)	9.8
Echo time (ms)	4.6
Pixel size (mm)	0.5
Section thickness (mm)	1
FLAIR	
Repetition time (ms)	9250 ± 433 (9000–10000)
Echo time (ms)	128.8 ± 4.8 (125–135)
Pixel size (mm)	0.76 ± 0.14 (0.65–0.94)
Section thickness (mm)	4.5 ± 0.3 (4–5)

Note: CE-T1WI = contrast-enhanced T1-weighted imaging, FLAIR = fluid attenuated inversion recovery.

Supplementary Table 2. Variable importance of the clinical predictors, conventional imaging findings, and tumor habitats using random survival forest analysis.

Variable	Importance
Atypical finding	0.0185
Hypovascular cellular habitat	0.0049
Age	0.0037
Hypovascular hypocellular habitat	0.002
Deep location	−0.0005
ECOG	−0.0009
CSF-total protein	−0.0028
Hypervascular cellular habitat	−0.0040
Serum LDH level	−0.0148

Preprocessing and parameters of the DWI and DSC imaging

The DWI parameters were as follows: repetition time (TR)/echo time (TE), 3000/56 ms; diffusion gradient encoding, b = 0 and 1000 mm^2/s; field of view (FOV), 250 × 250 mm; matrix, 256 × 256; and slice thickness/gap, 5/2 mm. ADC images were calculated from b = 1000 and b = 0 mm^2/s DWI images.

DSC perfusion imaging and three-dimensional (3D) CE-T1-weighted imaging were performed after contrast injection. DSC imaging was acquired using a gradient-echo echo-planar imaging protocol. A preload of 0.01 mmol/kg gadoterate meglumine (Dotarem; Guerbet) was administered, followed by a dynamic bolus of a standard dose of 0.1 mmol/kg gadoterate meglumine delivered at a rate of 4 mL/s by an MRI-compatible power injector (Spectris; Medrad). The contrast material bolus was followed by a 20 mL saline injection delivered at the same rate. The DSC imaging parameters included the following: TR/TE, 1808/40 ms; flip angle, 35°; FOV, 24 × 24 cm; slice thickness/gap, 5/2 mm; matrix, 128 × 128; total acquisition time, 1 min and 54 s. The dynamic acquisition was performed with a temporal resolution of 1.5 s and 60 dynamics were acquired. DSC imaging was acquired with complete tumor volume coverage and the same section orientation as that used for conventional MRI. The parameters of the CE-T1-weighted imaging included: TR/TE, 10/5 ms; flip angle, 10°; FOV, 256 mm; matrix, 256 × 256; and slab thickness, 18 mm.

Supplementary Figure.

Atypical features (necrosis or hemorrhage component) of primary central nervous system lymphoma on conventional MRI. **A**. The left basal ganglia demonstrates an irregular-shaped peripheral enhancing lesion with inner non-enhancing tumor necrosis. There is abundant perilesional edema. **B.** A mass in the left temporo-occipital lobe demonstrates a peripheral irregular enhancing wall and inner hemorrhage, with hemosiderin deposition, T1 signal intensity, and high attenuation on CT being notable. There is abundant perilesional edema.