



**Figure S1** Flowchart illustrating patient recruitment in the study. USTC, University of Science and Technology of China; T2-FLAIR, T2-weighted fluid-attenuated inversion recovery; ssEPI, single-shot echo-planar imaging; msEPI, multishot echo-planar imaging; DWI, diffusion-weighted imaging; MRI, magnetic resonance imaging; ACI, acute cerebral infarction; LGG, low-grade glioma.

**Table S1** Kolmogorov-Smirnov normality test for all subjective scores

| Sequence | Kolmogorov-Smirnov P values |                         |              |                       |
|----------|-----------------------------|-------------------------|--------------|-----------------------|
|          | Anatomical distortion       | Susceptibility artifact | Edge clarity | Overall image quality |
| Reader 1 |                             |                         |              |                       |
| ssEPI    | <0.001                      | <0.001                  | <0.001       | <0.001                |
| msEPI    | <0.001                      | n.a.                    | <0.001       | <0.001                |
| Reader 2 |                             |                         |              |                       |
| ssEPI    | <0.001                      | <0.001                  | <0.001       | <0.001                |
| msEPI    | <0.001                      | n. a.                   | <0.001       | <0.001                |

Normal distribution was rejected at  $P < 0.05$ . ssEPI, single-shot echo-planar imaging; msEPI, multishot echo-planar imaging; n.a., not applicable because the rating scores were 3 for all the participants for both readers.

**Table S2** SNR and CNR of ssEPI and msEPI DWI in 42 patients with brain lesions

| Indicator types       | ssEPI     | msEPI     | P value |
|-----------------------|-----------|-----------|---------|
| SNR <sub>lesion</sub> | 46.5±39.1 | 47.4±39.6 | 0.848   |
| SNR <sub>normal</sub> | 25.6±18.1 | 24.3±16.7 | 0.601   |
| CNR                   | 7.3±5.0   | 7.5±5.3   | 0.638   |

Data are presented as the mean ± standard deviation. SNR, signal-to-noise ratio; CNR, contrast-to-noise ratio; ssEPI, single-shot echo-planar imaging; msEPI, multishot echo-planar imaging; DWI, diffusion-weighted imaging.

**Table S3** SNR in the thalamus and corpus callosum of ssEPI and msEPI DWI in 20 randomly selected participants

| SNR values                     | ssEPI    | msEPI    | P value |
|--------------------------------|----------|----------|---------|
| SNR <sub>thalamus</sub>        | 16.5±6.7 | 15.5±5.2 | 0.329   |
| SNR <sub>corpus callosum</sub> | 18.3±9.6 | 16.3±9.5 | 0.532   |

Data are presented as the mean ± standard deviation. SNR, signal-to-noise ratio; ssEPI, single-shot echo-planar imaging; msEPI, multishot echo-planar imaging; DWI, diffusion-weighted imaging.

**Table S4** Comparison between ADC values of the thalamus and corpus callosum of ssEPI and msEPI DWI in 20 randomly selected participants

| ADC values ( $\times 10^{-6}$ mm <sup>2</sup> /s) | ssEPI       | msEPI       | P value |
|---|-------------|-------------|---------|
| Thalamus ADC                                      | 794.5±85.3  | 806.8±138.3 | 0.590   |
| Corpus callosum ADC                               | 936.0±135.6 | 932.9±86.2  | 0.922   |

Data are presented as the mean ± standard deviation. ADC, apparent diffusion coefficient; ssEPI, single-shot echo-planar imaging; msEPI, multi-shot echo-planar imaging; DWI, diffusion-weighted imaging.