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# Anti-N-methyl-D-aspartate receptor encephalitis after resection of cerebral astrocytoma

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IMAGES IN NEUROCRITICAL CARE

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Anti-N-methyl-D-aspartate receptor (NMDAR) encephalitis is the most common type of autoimmune encephalitis associated with underlying neoplasms, mainly ovarian tumors [1]. The association between NMDAR encephalitis and brain neoplasm is very rarely reported. We report a case of NMDAR encephalitis which manifested as seizures after surgery for cerebral astrocytoma.

A 34-year-old man presented with generalized tonic seizures. Brain magnetic resonance imaging (MRI) showed a mass lesion with enhancement in the right insula (Fig. 1A and B) and a mass lesion in the temporal lobe. MR spectroscopy showed increased choline to creatine ratio and decreased N-acetylaspartate peak at right basal ganglia, suggesting a neoplastic lesion (Fig. 1C). A biopsy revealed a diffuse astrocytoma. Three months later, seizures and aphasia suddenly occurred, and a brain MRI showed that, compared to postoperative images (Fig. 1D), a new parietotemporal lesion had appeared in the left hemisphere (Fig. 1E and F). Anti-NMDAR antibodies were found in the blood and cerebrospinal fluid using the cell-based immunochemistry method and indirect fluorescence assay. High-dose intravenous steroids and anti-epileptic drugs were administered, and the patient is slowly recovering from the symptoms.

Paraneoplastic NMDAR encephalitis occurring after tumor removal is very rare, and it can be difficult to distinguish between NMDAR encephalitis and tumor infiltration or metastatic lesions [2,3]. It becomes even more difficult in cases with scatted cortical lesions, which was an unusual finding of our case. This case diagnosed NMDAR encephalitis through identification of anti-NMDAR antibodies in a patient with epileptic seizures and encephalitis after surgery.

## ARTICLE INFORMATION

### Ethics statement

This work was approved by the Ethics Committees of the Inje University Busan Paik Hospital (No. 2020-01-068), and written informed consent was obtained from the patient.

### Conflict of interest

No potential conflict of interest relevant to this article.

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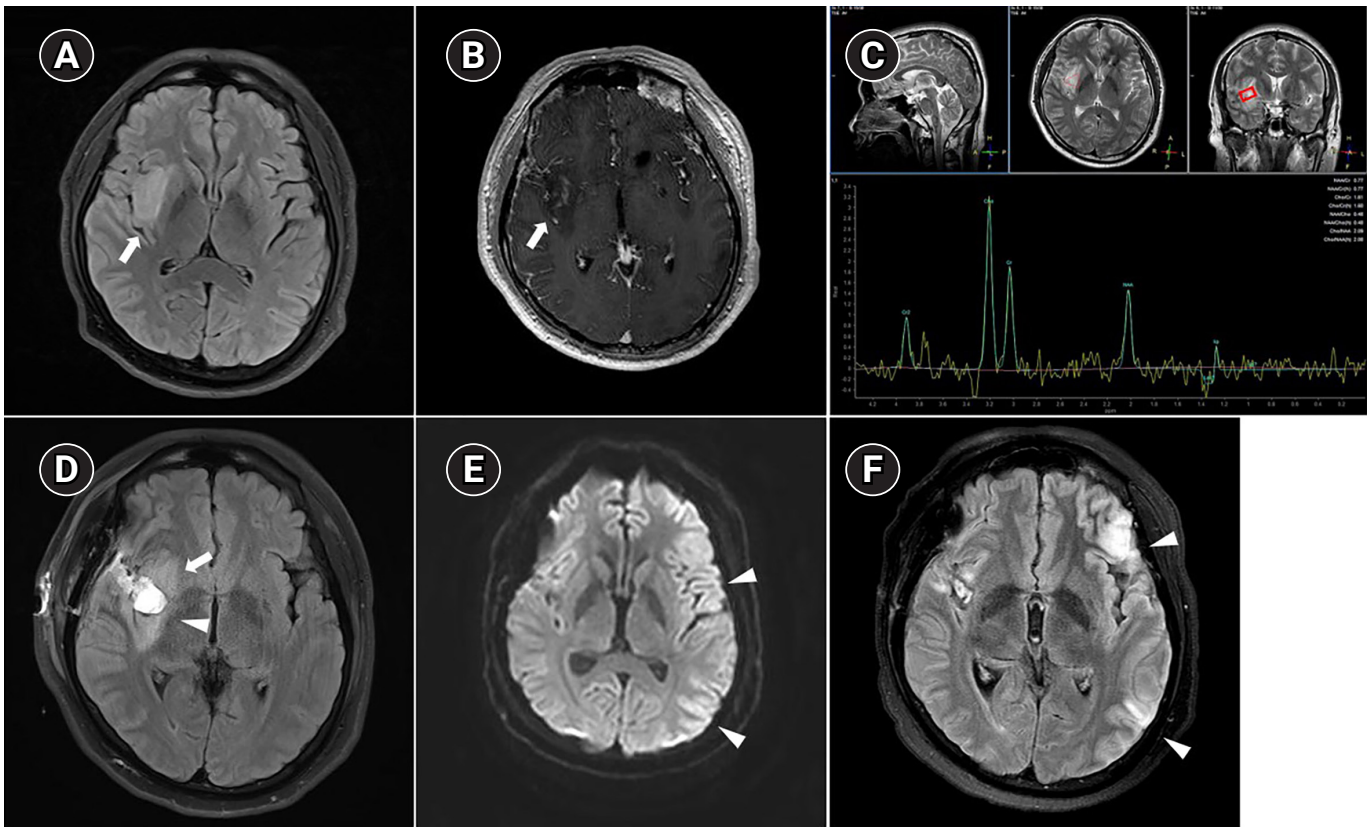


**Fig. 1.** Brain magnetic resonance imaging (MRI). Brain MRI showed an ill-defined, mass-like lesion (arrow) with high signal intensities at right basal ganglia, insula, external capsule, the temporal lobe on fluid-attenuated inversion recovery (FLAIR) image (A) and irregular enhancement (arrow) on axial contrast-enhanced T1-weighted image (B). (C) MR spectroscopy showed the slightly increased value of choline to creatine ratio and decreased value of N-acetylaspartate peak at the mass-like lesion involving right basal ganglia, insula, external capsule, and temporal lobe, suggesting tumorous condition (red square: volume of interest). (D) In the postoperative follow-up MRI, FLAIR showed remained tumor (arrow) and postoperative hemorrhage (arrowhead) on the right temporal lobe. After 3 months with seizure presentation, diffusion-weighted image (E) and FLAIR (F) showed newly occurred, multifocal hyperintense lesions (arrowheads) at left temporoparietal lobes.

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