To the Editor: A 27-year-old man without psychiatric history presented with a 2-month history of apathy, decreased responsiveness, and malaise. The onset of these new behavioral changes was preceded by fatigue and insomnia. On physical examination, the patient’s limbs had normal muscle tone and strength and no pathological reflexes were detected. Four years earlier, the patient underwent an operation for spinal meningioma resection. Before the operation, some analogous symptoms, like apathy and reduced responsiveness, appeared; the symptoms lasted for a month and remitted after the operation. Four days later, the patient developed mutism and apathy and reduced responsiveness, appeared; the symptoms lasted for a month and remitted after the operation. Four days later, the patient began regular anti-psychotic treatment, including olanzapine, escitalopram, sertraline, and oxazepam, but there was no improvement in his mutism and irresponsiveness.

Initial cerebrospinal fluid (CSF) analysis revealed a leukocyte count of 56 with 90% lymphocytosis, and normal levels of glucose and proteins. In addition, hematological and biochemical examinations, serum tumor markers, and serologic tests for viral and communicable infections were all negative. However, antibodies against N-methyl-D-aspartate receptor (NMDAR) were discovered in both serum and CSF and conformed the diagnosis of anti-NMDAR encephalitis. The patient was treated with human immunoglobulin 0.4 mg/kg per day for 5 days without any response. A study for occult neoplasms was performed via computed tomography (CT) of the chest, abdomen, and pelvis, and tumor markers were analyzed; all the tests were negative. The lumbar puncture repeated 2 weeks after the initial study and demonstrated the following abnormalities: nucleated cells 160 × 10^6/L (reference range, 0–5 × 10^6/L) with 80% lymphocytes, elevated protein 1196.91 mg/L (reference range, 150–450 mg/L), mild decrease in chloride 118.4 mmol/L (reference range, 120–132 mmol/L), and normal glucose levels. NMDAR antibodies were found again in both CSF and serum, with titers of 1:32 and 1:100, respectively. A CT scan of the brain revealed multiple, hypodense abnormalities in the cerebral cortex. Magnetic resonance imaging of the brain and cervical vertebra revealed multiple cortical abnormalities [Figure 1A–1C] and C1–C2 nodular intensity enhancement in the cervical cord [Figure 1D–1F] after intravenous injection of gadolinium-diethylenetriamine pentaacetic acid, which indicated a recurrence of spinal meningioma. The patient received emergency surgery and pathological results showed recurrent benign spinal meningioma on the cervical cord [Figure 1G and 1H]. After the operation, the patient’s clinical symptoms improved.

We reported the association between anti-NMDAR encephalitis and spinal meningioma. Anti-NMDAR encephalitis is the most common cause of autoimmune encephalitis and is characterized by psychiatric or cognitive symptoms, typically correlated with antibodies against neuronal cell-surface receptors. The first symptoms of anti-NMDAR encephalitis are usually psychoses or cognitive disturbances. Spinal meningioma is a benign and well-defined neoplasm that occurs most frequently in the thoracic spines of middle-aged women, with pain, significant weakness, and sensory loss presenting as the most common symptoms. Recurrence rates after surgical resection are around 1.3% to 14.7%.[3] However, tumors that underlie anti-NMDAR encephalitis are always teratomas, thymomas, and small cell lung carcinomas. Based on this case, spinal meningioma should also be included as an etiology of anti-NMDAR encephalitis. Therefore, central nervous system neoplasms should be taken into consideration when routine pelvic and chest CT scans of anti-NMDAR encephalitis patients show no signs of tumors, especially in patients with a medical history of central nervous system neoplasms.

Although the protopathy of spinal meningioma is unclear, it has a tendency to relapse and manifests with complications, such as psychosis or acute behavioral changes, after surgery. Thus, it is important to be vigilant...
for tumor recurrence if the resection operation fails to induce clinical improvement. Recurrence or deterioration of primary symptoms should not be attributed to surgeries. Moreover, the decrease in antibody titer after tumor resection may be the reason for symptom remission, and this needs to be confirmed by further study.

In conclusion, anti-NMDAR encephalitis accompanied with isolated behavioral changes is a relatively rare phenomenon. Furthermore, anti-NMDAR encephalitis secondary to recurrent spinal meningioma has not yet been reported. Therefore, spinal meningioma should be classified to have a tumor pedigree in anti-NMDAR encephalitis. Psychiatrists and neurosurgeons should be aware of the clinical characteristics and differential diagnoses of this syndrome, as they may encounter such patients in many settings. Additional studies are needed to explore whether benign tumors are more likely to merge with NMDAR encephalitis and the mechanisms of symptom remission after surgery.

Declaration of patient consent
We have obtained all appropriate patient consent forms. The patient has given consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published, and every effort will be made to conceal the identity of the patient, although anonymity cannot be guaranteed.

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Conflicts of interest
None.

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