CLINICAL CASE

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Cite as: Vargas-Vera R, Placencia-Ibadango M, Rosales-Arroba R, Troya-Toala J, Vargas-Silva K, Toapanta-Rea I. Autoimmune encephalitis associated with anti-NMDA receptor antibodies and ovarian teratoma. Rev Peru Ginecol Obstet. 2025;71(4). DOI: https://doi.org/10.31403/rpgo.v71i2816

Autoimmune encephalitis associated with anti-NMDA receptor antibodies and an ovarian teratoma

Encefalitis autoinmune por anticuerpos anti-NMDA asociada a teratoma ovárico

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DOI: https://doi.org/10.31403/rpgo.v71i2816

ABSTRACT

We report the case of a young woman with autoimmune encephalitis mediated by antibodies against the N-methyl-D-aspartate (NMDA) receptor, associated with an ovarian teratoma. A 25-year-old patient presented with acute psychiatric symptoms, seizures, and impaired level of consciousness. Neuroimaging studies revealed bilateral temporal hyperintensities, cerebrospinal fluid analysis was positive for anti-NMDA receptor antibodies, and gynecological evaluation identified an ovarian teratoma. Immunomodulatory therapy was initiated, and surgical resection of the tumor was performed, resulting in favorable clinical evolution. Anti-NMDA receptor encephalitis should be considered in young women presenting with subacute neuropsychiatric symptoms. Early diagnosis and multidisciplinary management are crucial determinants of good prognosis.

Keywords: autoimmune encephalitis; NMDA receptor; ovarian teratoma; paraneoplastic syndrome; immunotherapy.

RESUMEN

Se presenta el caso de una mujer joven con encefalitis autoinmune mediada por anticuerpos contra el receptor N-metil-D-aspartato (anti-NMDA), asociada a teratoma ovárico. Paciente de 25 años que inició con alteraciones psiquiátricas agudas, convulsiones y compromiso del nivel de conciencia. Los estudios de neuroimagen evidenciaron hiperintensidades temporales bilaterales, el líquido cefalorraquídeo resultó positivo para anticuerpos anti-NMDA y los estudios ginecológicos identificaron un teratoma ovárico. Se instauró tratamiento inmunomodulador y se realizó resección quirúrgica del tumor, con evolución clínica favorable. La encefalitis anti-NMDA debe considerarse en mujeres jóvenes con síntomas neuropsiquiátricos de inicio subagudo. El diagnóstico temprano y el manejo multidisciplinario son determinantes para un buen pronóstico.

Palabras clave: encefalitis autoinmune; receptor NMDA; teratoma ovárico; síndrome paraneoplásico; inmunoterapia.

Introduction

Autoimmune encephalitis (AE) is a significant and potentially treatable cause of subacute encephalopathy, particularly in young adults and children [(1)]. Since the initial description of encephalitis mediated by antibodies against the N-methyl-D-aspartate (anti-NMDA) receptor in 2007, this entity has been recognized as the most common form of autoimmune encephalitis associated with antibodies targeting neuronal surface antigens [(2)].

From an epidemiological perspective, approximately 81% of cases occur in women. In patients over the age of 18, up to 58% are associated with ovarian teratoma, whereas in the pediatric population, this association is observed in about 37% of cases[(3, 4)]. These age-related differences suggest distinct immunopathogenic mechanisms depending on age.

Clinically, anti-NMDA receptor encephalitis typically begins with nonspecific prodromal symptoms, followed by acute psychiatric symptoms, seizures, movement disorders, and altered levels of consciousness[(2, 5)]. Brain MRI may be normal or show abnormalities in the limbic system, while the

diagnosis is confirmed by detecting anti-NMDA receptor antibodies in serum or cerebrospinal fluid [6].

Ovarian teratomas, tumors derived from totipotent germ cells, can express mature neuronal tissue, which would explain their role as triggers of the autoimmune response[7]. Early surgical resection of the tumor, combined with immunotherapy, is associated with favorable neurological recovery[8, 9].

We present the case of a young woman with anti-NMDA receptor encephalitis associated with ovarian teratoma, highlighting the importance of timely diagnosis and an interdisciplinary approach.

Case report

A 25-year-old previously healthy woman, employed as a nurse, presented with a two-week history of progressive behavioral changes prior to hospital admission. These manifestations included emotional lability, anxiety, episodes of inappropriate laughter and crying, as well as visual and auditory hallucinations.

Personal history

Segmental cesarean section two years prior. Menarche at age 13; regular menstrual cycles. No history of psychiatric disorders or use of immunosuppressive medications.

Clinical timeline

- Week 1–2: progressive psychiatric symptoms
- Day 14: generalized tonic-clonic seizure and impaired consciousness
- Hospitalization: comprehensive etiological evaluation
- Week 3: initiation of immunotherapy and surgery
- Follow-up: progressive neurological recovery

Clinical and Diagnostic Evaluation

On admission, the patient presented with a Glasgow Coma Scale score of 14/15, psychomotor agitation, catatonia, and orofacial dyskinesias. A cranial CT scan was normal. A brain MRI showed bilateral hyperintensities in the temporal lobes. An EEG revealed diffuse slowing. (Fig 1)

Cerebrospinal fluid (CSF) analysis showed no pleocytosis; the infectious panel was negative. Anti-NMDA antibodies were detected in the CSF. Pelvic MRI identified an ovarian mass consistent with a teratoma. (Fig 2, 3)

Therapeutic Intervention

Intravenous methylprednisolone (1 g/day for 5 days) was initiated, followed by intravenous immunoglobulin. Oophorectomy was performed, confirming a mature ovarian teratoma. (Fig. 4 a–d)

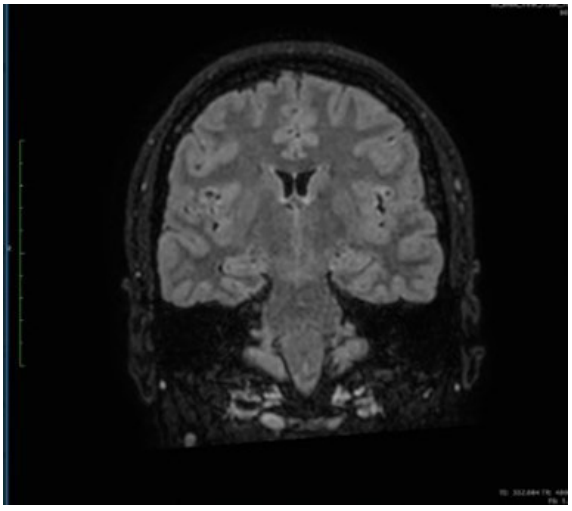

Figure 1. Gadolinium-enhanced brain MRI showing bilateral hyperintensities in the temporal lobes, hippocampus, and insular region, consistent with limbic inflammation in the context of anti-NMDA receptor encephalitis.

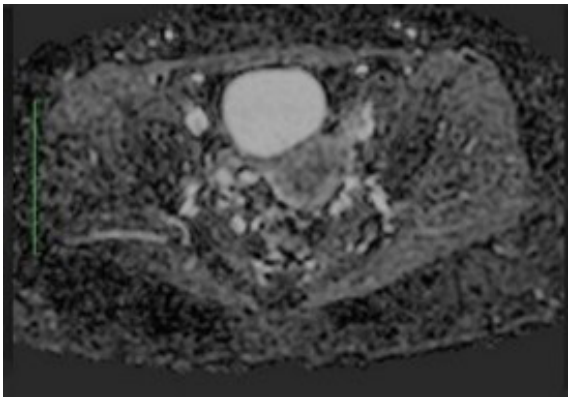

Figure 2. Pelvic MRI showing a complex cystic lesion in the left ovary, suggestive of an ovarian teratoma.

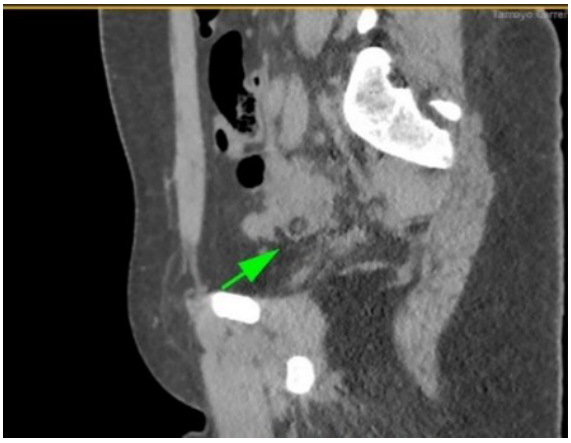

Figure 3. Abdominal-pelvic computed tomography scan showing a left adnexal mass with a solid component and internal calcifications, consistent with a mature ovarian teratoma

Course and Follow-up

The patient showed progressive neurological improvement. One month after discharge, she was walking independently, and one year later, she had resumed her usual activities without neurological sequelae.

Discussion

Anti-NMDA receptor encephalitis is the most common form of autoimmune encephalitis and represents a major cause of acute reversible psychosis in young women[2, 6]. Recent reviews and a published series of 15 cases confirm that the combination of early immunotherapy and teratoma resection is associated with better functional outcomes[4, 5].

Our case is consistent with recent literature regarding clinical presentation, neuroimaging findings, and favorable response to early treatment. Identification of the teratoma was key to complete neurological recovery, as described in contemporary studies[9–11].

Conclusions

Anti-NMDA receptor encephalitis should be considered in young women presenting with subacute neuropsychiatric symptoms. Systematic gynecological evaluation and early immunomodulatory treatment, along with tumor resection when indicated, are critical for a favorable prognosis.

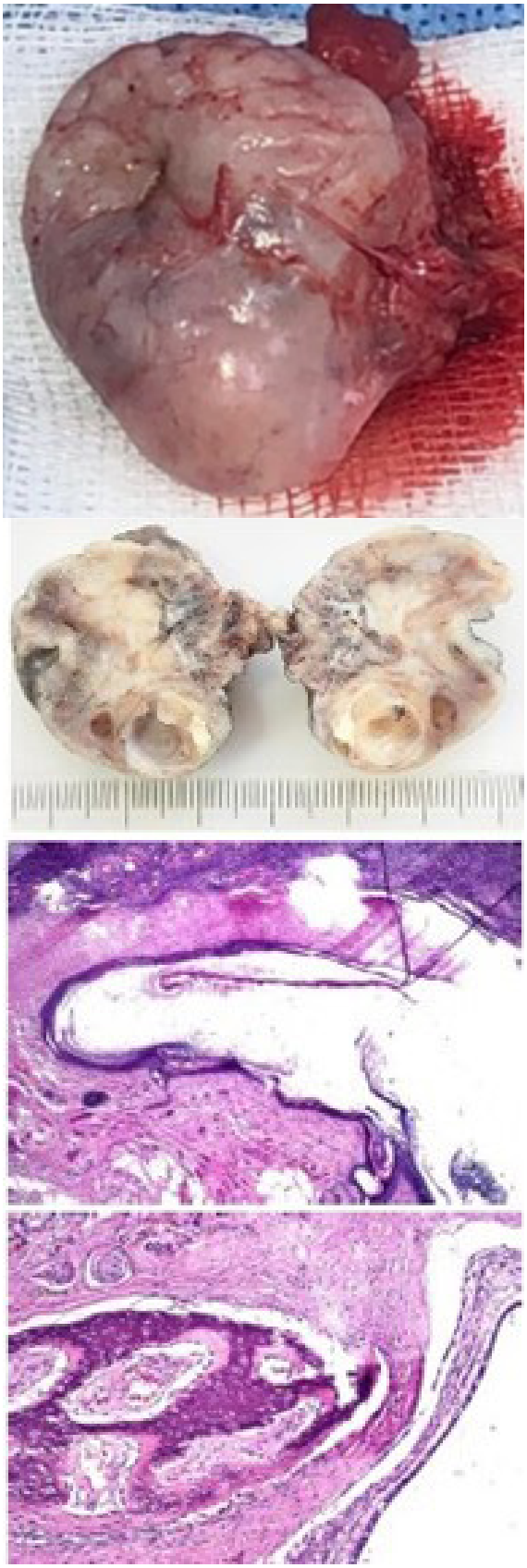

Figure 4. a–d: Microscopy and histopathological study of ovarian teratoma. Dermal structures and tissues derived from the three germ layers are observed (hematoxylin-eosin stain, 10× magnification).

Article information

Received: September 9, 2025
Accepted: January 15, 2026
Published online: February 6, 2026

Conflicts of interest: The authors declare that they have no conflicts of interest.

Funding source: Self-funded.

Statement on the use of artificial intelligence (AI): The authors declare that no artificial intelligence (AI) tools were utilized in the preparation of this article.

Ethical considerations: This study was approved by the Institutional Ethics Committee. Written informed consent was obtained from the patient for the publication of the case and associated images, ensuring confidentiality.

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