American Journal of Transplantation Images in Transplantation—Continuing Medical Education (CME)

Each month, the *American Journal of Transplantation* will feature Images in Transplantation, a journal-based CME activity, chosen to educate participants on current developments in the science and imaging of transplantation. Participants can earn 1 *AMA PRA Category 1 Credit*™ per article at their own pace.

This month's feature article is titled: "New-Onset Seizures 15 Years After Renal Transplant."

Accreditation and Designation Statement

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of Blackwell Futura Media Services, the American Society of Transplant Surgeons, and the American Society of Transplantation. Blackwell Futura Media Services is accredited by the ACCME to provide continuing medical education for physicians.

Blackwell Futura Media Services designates this journal-based CME activity for a maximum of 1 *AMA PRA Category 1 Credit*™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Statement of Need

The neurologic complications of solid organ transplantation span a wide variety of infectious, toxic, and immunologic etiologies. The correct diagnosis of these occasionally rare entities is necessary for effective treatment and for the prevention of unnecessary morbidity and mortality.

Purpose of Activity

The purpose of this activity is to improve the differential diagnosis skills of physicians when faced with severe neurologic complications in a transplant patient and to review the appropriate diagnostic and therapeutic actions.

Identification of Practice Gap

Central nervous system (CNS) complications of many different etiologies are relatively common in immunosuppressed patients. These complications may be specific to the transplant patient or have atypical presentations, which emergency physicians, radiologists, neurologists, and transplant specialists still fail to recognize. The failure to recognize CNS complications leads to incorrect planning of the diagnostic workup, which should include infectious, toxic, immune, and other etiologies. This failure also delays diagnosis and may cause incorrect therapeutic actions, which negatively impact patient outcomes.

Learning Objectives

Upon completion of this educational activity, participants will be able to:

- Identify potential etiologies of new-onset seizures in solid organ transplant patients.
- Diagnose the cause of new-onset seizures based on radiological imaging.
- Identify the pathophysiology of the neurologic condition.
- Assess the likelihood of symptom resolution with appropriate treatment, including the need for ongoing therapy.

Target Audience

This activity has been designed to meet the educational needs of physicians in the field of transplantation, emergency physicians, neurologists, and radiologists who may come in contact with transplant patients.

Disclosures

No commercial support has been accepted related to the development or publication of this activity. Blackwell Futura Media Services has reviewed all disclosures and resolved or managed all identified conflicts of interest, as applicable.

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Instructions on Receiving CME Credit

This activity is designed to be completed within an hour. Physicians should claim only those credits that reflect the time actually spent in the activity. This activity will be available for CME credit for 12 months following its publication date. At that time, it will be reviewed and potentially updated and extended for an additional 12 months.

Follow these steps to participate, answer the questions, and claim your CME credit:

- Log on to https://www.wileyhealthlearning.com/ajt
- Read the learning objectives, target audience, and activity disclosures.
- Read the article in print or online format.
- Reflect on the article.
- Access the CME Exam, and choose the best answer to each question.
- Complete the required evaluation and print your CME certificate.

Images in Transplantation

Look and Learn

New-Onset Seizures 15 Years After Renal Transplant

A 51-year-old female patient with a history of end-stage renal disease due to autosomal dominant polycystic kidney disease and resistant hypertension underwent a deceased donor kidney transplant 15 years earlier. Her baseline blood urea nitrogen (BUN) level was 14 mg/dL, and her creatinine level was 1.10 mg/dL. The patient experienced no complications except frequent urinary tract infections, which were easily treated. She had no personal or family history of intracranial aneurysms. Her medication consisted of sirolimus, mycophenolate mofetil (MMF), clonidine, atorvastatin, and calcium carbonate.

She was brought to the emergency room after a new-onset generalized tonic–clonic seizure. During the previous 2 months, she had been complaining of constant fronto-occipital headaches and occasional diplopia, and was having regular appointments with her attending neurologist and ophthalmologist. On arrival, her blood pressure was 159/80 mmHg. Her pulse was 78 beats per minute, and her temperature was 37°C. She had no other relevant findings on physical examination. A thorough neurologic examination was conducted. She was still confused and slightly dysarthric, but she had no focal neurologic deficits and no meningeal signs. No abnormal findings were detected on fundoscopy. Initial blood tests showed a raised white blood cell count (17 100/μL) with a low C-reactive protein and normal electrolytes. The serum creatinine level was 1.26 mg/dL, and BUN was 16.8 mg/dL. Her sirolimus trough level was 7.1 μg/L. A lumbar puncture was performed; cytochemical, bacterial, and mycobacterial examinations were normal. Anti-neutrophil cytoplasmic antibodies and cryptococcal antigen detection in the cerebrospinal fluid were negative. Polymerase chain reaction tests were negative for herpes family viruses, cytomegalovirus, Epstein–Barr virus, lymphocytic choriomeningitis virus, JC virus, enterovirus family, parvovirus B19, and *Toxoplasma gondii*. A plain cranial computed tomography (CT) scan was ordered (Figure 1), followed by an MRI scan (Figure 2).

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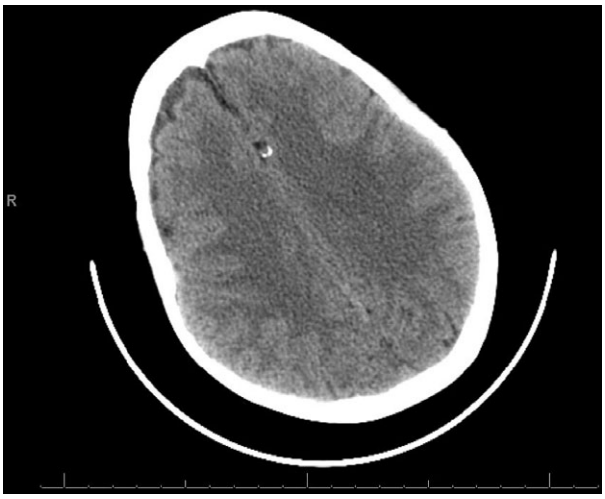

Figure 1: Cranial CT showing bilateral frontal chronic collections, with no apparent parenchymal findings.

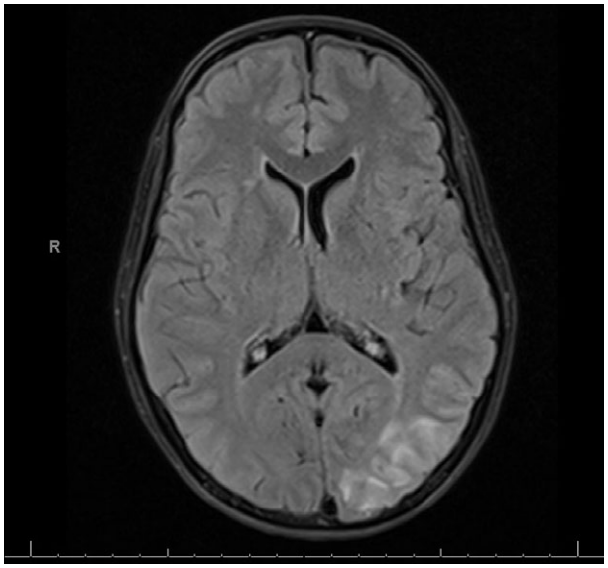

Figure 2: Cranial MRI showing a T2 hyperintense signal in the cortico-subcortical region of the left parieto-occipital lobes.

Questions

1. What is the most likely diagnosis?

a. Astrocytoma
b. Central nervous system vasculitis
c. Herpetic encephalitis
d. Posterior reversible encephalopathy syndrome
e. Ruptured intracranial aneurysm

2. What drugs have been implicated in this disease?

a. Calcineurin inhibitors and sirolimus
b. Clonidine
c. HMG-CoA inhibitors (statins)
d. Prednisone
e. Valganciclovir

3. What is the recommended course of action?

a. High-dose corticosteroids and cyclophosphamide
b. Control of blood pressure and change in immunosuppressive drugs
c. Immediate withdrawal of all immunosuppressive drugs
d. High-dose corticosteroids and localized radiotherapy
e. Urgent surgical trepanation

4. What is the expected outcome after adequate treatment?

a. 20% mortality rate
b. Complete remission of symptoms
c. Permanent cortical blindness
d. Progressive neurodegenerative disorder
e. Recurrent seizures

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