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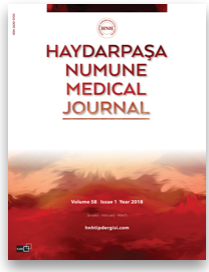

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CASE REPORT

A Case of PML Developing Secondary to Kidney Transplantation Treatment (Immunosuppressive Therapy)

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Abstract

Progressive multifocal leukoencephalopathy (PML) is a rare and often fatal central nervous system (CNS) disease caused by the John Cunningham polyomavirus (JCV). Here, we present a case of PML that developed 12 years after kidney transplantation in a 36-year-old patient. The patient presented to the emergency department with weakness and numbness in the right arm, which resolved after treatment, restoring normal muscle strength. Treatment involved a gradual reduction of immunosuppressive therapy and plasmapheresis every other day for five days. PML can have an aggressive and fatal course, but our case was considered to have a favorable (atypical) onset of PML. Early diagnosis and treatment are believed to impact the prognosis of PML.

Keywords: Central Nervous System; John Cunningham Polyomavirus; Kidney Transplantation; Progressive Multifocal Leukoencephalopathy.

Progressive multifocal leukoencephalopathy (PML) is a rare and often fatal central nervous system (CNS) disease caused by the JC virus (JCV). Conditions such as malignancies, HIV, organ transplantation, and drugs like natalizumab, which induce immunosuppression, can lead to PML[1]. Here, we aim to report a case of PML that developed in a male patient who had been on long-term immunosuppressive therapy following kidney transplantation, and exhibited a favorable clinical course.

Case Report

A 36-year-old male patient presented to the emergency department with complaints of numbness and weakness in his right arm that had been occurring for approximately 1 day. The patient's medical history revealed a kidney transplantation 12 years ago, and he had been using tacrolimus 5mg 1x1, mycophenolate 360mg 1x1, and deltacortil 5mg 1x1. His family history was unremarkable. Vital signs including pulse rate, temperature, blood pressure, and respiratory rate were normal. Neurological examination showed +4/5 muscle strength in the right upper extremity, hypoesthesia in the right upper extremity, and a positive Babinski sign on the right side. Brain CT imaging revealed no bleeding but showed widespread hypodense areas. Brain MRI showed extensive T2 FLAIR hyperintense areas in the left cerebral hemisphere extending from the vertex level of the frontal and parietal white matter to the vicinity of the left lateral ventricle atrium, and in the right cerebral hemisphere extending from the centrum semiovale level of the parietal white matter to the posterior aspects of the internal and external capsules and the right temporal white matter. Given the

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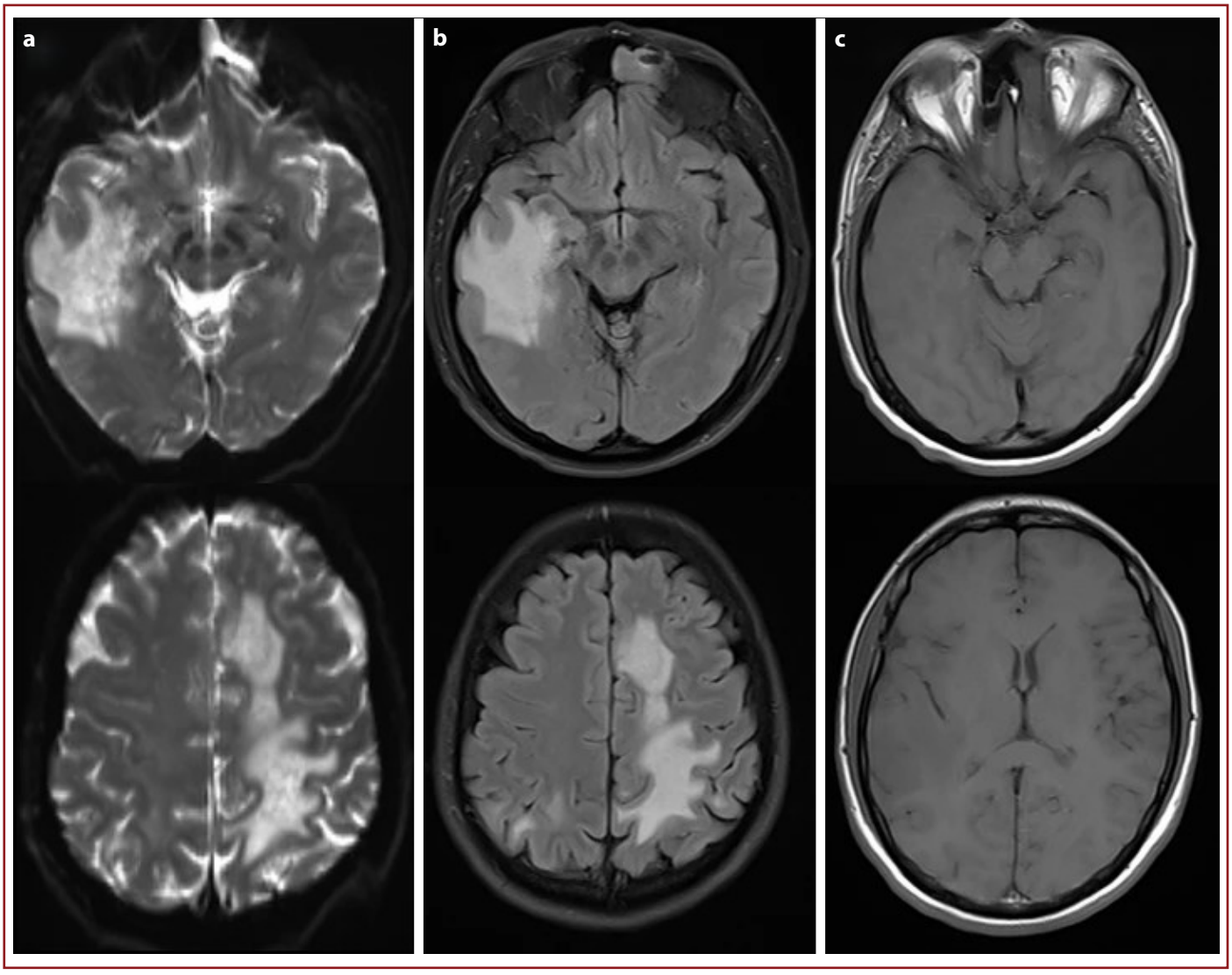

Figure 1. Showing MRI brain axial sequences Diffusion **(a)** / FLAIR **(b)** / T1 with contrast **(c)** at various stages of the patient.

patient's history of kidney transplantation and tacrolimus use, PML was suspected (Fig. 1). JC DNA was detected in the patient's blood. HIV, CMV, immunoglobulins, erythrocyte sedimentation rate, and tumor markers were normal. The patient's Mini-Mental State Examination (MMSE) score was 25/30. The patient was found to be JC virus positive from cerebrospinal fluid (CSF) through a lumbar puncture. The patient was consulted with the nephrology department, and the medication was switched from tacrolimus 5mg 1x1 to cyclosporine 25mg 2x3. Additionally, mycophenolate therapy was discontinued after 2 weeks. The patient underwent plasmapheresis every other day for 5 days. Zonisamide 100mg every other day 1x1 was initiated to control focal seizures. The patient's weakness improved after plasmapheresis, and his clinical condition remained stable with no new seizure episodes.

Discussion

Progressive multifocal leukoencephalopathy (PML) is a severe demyelinating disease of the CNS caused by the reactivation of JC virus (JCV) in immunosuppressed individuals. Various types of PML exist, including classical, inflammatory, and iatrogenic forms, with treatment options like removal of iatrogenic factors, plasmapheresis, granulocyte colony-stimulating factor, and antiviral therapy[1,2]. PML occurs through the reactivation of human polyomavirus 2 (HPyV-2), previously known as John Cunningham polyomavirus or JCV, in immunosuppressed individuals, spreading along infected B-cells and affecting brain oligodendrocytes by crossing the blood-brain barrier[3]. Many PML cases are associated with malignancy, HIV, post-transplantation, or iatrogenic causes[3-8]. In our case, PML occurred 12 years after kidney transplantation,

highlighting the importance of considering PML regardless of the time since transplantation[4]. Although PML is generally linked to poor prognosis, our patient demonstrated a good outcome. Early diagnosis and prompt removal of the causative iatrogenic agent might have contributed to this. Additionally, gradual reduction of immunosuppressive therapies (starting with tacrolimus and then mycophenolate) might have prevented rebound syndrome. While asymptomatic PML cases are rare, our patient exhibited an atypical course with a heavy lesion load but a favorable prognosis. PML should be considered in patients with acute neurological deficits and underlying immunosuppression. Diagnosis involves clinical, radiological, and laboratory findings such as magnetic resonance imaging (MRI), cerebrospinal fluid (CSF) analysis, and polymerase chain reaction (PCR) amplification, though there is no specific treatment available yet[9].

Conclusion

In patients with kidney transplantation, the possibility of developing PML should be considered regardless of the time elapsed since the transplantation. Rapid clinical diagnosis and appropriate treatment can prevent the progression of this potentially fatal condition.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report.

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