



## Case report

# Varicella zoster encephalitis in an immunocompromised patient presented with migraine type headache: A case report

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## ABSTRACT

Varicella zoster virus (VZV) has been increasingly linked with encephalitis and atypical presentations in immunosuppressed patients. We present a patient with history of immunosuppressant intake for polymyositis who initially presented with throbbing frontal headache that raised the suspicion of migraine. She did not respond to anti-migraine medication and later developed stimulus induced myoclonus. She then had significant neurological decline and eventually became encephalopathic. Her initial imaging of brain was unremarkable which warranted further investigations. She was then diagnosed to be VZV positive in the cerebrospinal fluid (CSF) sample that confirmed VZV encephalitis. She responded well to IV Acyclovir treatment and her neurological function improved significantly. In this case, there was delay in diagnosis of VZV in the setting of immunosuppression and non-specific clinical presentation. Therefore, we encourage to strongly consider early VZV diagnostic work up and treatment in immunocompromised patients who can present with non-specific symptoms without a typical cutaneous rash.

## 1. Introduction

Encephalitis is an uncommon complication of varicella zoster virus (VZV) infection in immunocompetent population. However, immunocompromised patients, individuals with autoimmune diseases and patients on immunosuppression have increased vulnerability to VZV dissemination, thus increasing morbidity and mortality [1,2].

It has been reported that VZV is not only associated with dermatomyositis (DM) and polymyositis (PM) but also increases the risk [3]. The factors determining VZV infection are old age, female gender, history of trauma to already affected dermatome, immunologic response and interleukin 10 gene polymorphism [4,5].

Clinical features may be atypical and skin lesions may be frequently be absent masking the varicella diagnosis in immunocompromised patients [4]. Instead these patients may present with neurological complications such as meningoencephalitis, cerebellitis, myelopathy, zoster paresis, vasculopathy, leukoencephalopathy, dorsal root or cranial nerve ganglionitis, postherpetic neuralgia, polyradiculoneuritis,

ventriculitis and necrotizing angiitis and cause fatal outcome if overlooked [6].

Diagnosis is usually delayed due these atypical presentations and initial focus on nonspecific investigative results. It is still not a routine practice to investigate for varicella in immunocompromised encephalopathic patients during initial investigations. Frequently, the patient's clinical symptoms are initially attributed to other etiologies and the therapeutic window of opportunity is lost before the definitive diagnosis can be established. At our medical center, we treated a patient with suspicion of encephalitis based on clinical features and CSF (cerebrospinal fluid) findings supported the diagnosis of VZV which led to timely intervention [2].

## 2. Case

A 60-year-old African American female who has been treated for polymyositis was admitted recently for management of vulvar abscess. The patient had vulvar abscess incision and drainage surgery

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performed under intradermal bupivacaine. She developed non-radiating throbbing frontal headaches and occasional occipital headaches of 8/10 severity the night prior to surgery. The associated symptoms included nausea, vomiting, photophobia but no phonophobia.

She had no prior history of severe headache or migraine. Her past medical history included hypertension, type II diabetes, interstitial lung disease secondary to polymyositis, pulmonary hypertension, non-ischemic cardiomyopathy status post ICD placement, paroxysmal chronic Atrial fibrillation, chronic kidney disease (CKD) stage III and chronic anemia.

Computer tomography (CT) scan of head was unremarkable. Magnetic resonance imaging (MRI) could not be done because her implantable cardioverter defibrillator was not MRI compatible.

She was treated with Toradol, Compazine and Benadryl for possible migraine that didn't resolve completely.

Following the surgery, she developed multiple repetitive jerking movements from third day onward. These jerking movements were induced by physical stimuli and lasted for a few minutes each. Her mentation worsened over the next few days which raised the concern for encephalopathy. There were no medications administered perioperatively which could be associated with myoclonus. She was diagnosed with encephalitis induced myoclonus with superimposed renal failure which was well controlled after starting Acyclovir.

On the physical exam, her Glasgow coma scale score was 3. Her gaze was deviated upwards. Pupils were round and symmetrically reactive to light. She was intubated with absent cough or gag reflex. When the patient was physically stimulated, irregular myoclonic jerking activity was observed in all extremities that lasted for about one minute.

There were antigravity movements in her extremities. Kernig and Brudzinski sign were not present but concern was the new onset of headache with worsening in setting of immunocompromised status.

Electroencephalogram (EEG) showed generalized slowing with triphasic waves that is consistent with metabolic/hypoxic encephalopathy. She was started on Depakote to control stimulus induced myoclonus. Given the chronic history of steroid use and CellCept for polymyositis, and presence of altered mentation along with aforementioned symptoms, lumbar puncture (LP) was performed to evaluate for underlying meningitis/encephalitis. CSF VZV polymerase chain reaction returned positive.

CSF analysis revealed glucose of 120 mg/dL, protein of 179 mg/dL, nucleated cells of 85/cumm (Neutrophils 0%, Lymphocyte 83%, Monocyte 17%). CSF culture showed no organisms growth. Serum glucose level was 115 mg/dL. Based on CSF findings and clinical signs, VZV encephalitis was diagnosed and Acyclovir was prescribed for twenty-one days.

The frequency of myoclonic jerks decreased after starting Acyclovir. Her mentation improved gradually and she was extubated. She was alert and oriented to person, place, and time. Speech was fluent but slow. Comprehension and higher cognitive functions were intact. Her myoclonic jerks improved but she had some residual motor deficits. At discharge, patient was sent to long term facility.

### 3. Discussion

VZV encephalitis is an uncommon complication of immunosuppressive treatment with mean annual incidence of 3 cases per 100,000 inhabitants [7]. Delayed diagnosis and treatment of VZV encephalitis in patients who presented with non-specific symptoms in the absence of skin lesions can have grave outcomes. Previous episodes of shingles in an immunosuppressed patient with encephalopathy should raise the alarm of VZV encephalitis [8]. However, this part of history can go overlooked or missed during history collection in the absence of

current skin lesions. The lack of evidence of such episodes should not eliminate this diagnosis of VZV encephalitis from the initial differential. In our case the patient presented with typical migraine type of headache followed by myoclonic jerks. Even though the patient was immunocompromised, VZV was not suspected initially because of the atypical presentation. The diagnosis and treatment were delayed until the patient became encephalopathic. We propose that migraine or other forms of headaches in an immunocompromised patient in the absence of typical cutaneous zoster lesions should alert the physician of VZV CNS infection to avoid delay in diagnosis. VZV encephalitis should therefore be considered in immunosuppressed patients presenting with headache, seizure, myoclonic jerks and encephalopathy.

### 4. Conclusion

VZV encephalitis should be included in initial list of differential diagnoses of immunocompromised patients with altered mentation, absence of cutaneous zoster lesions and unremarkable brain imaging to avoid delay in diagnosis. It might also be beneficial to screen for immunization status and administer vaccine in patients with PM or DM like our case, prior to commencing immunosuppression.

In the medical community there is still a lag in starting patients on appropriate empiric treatment until confirmation with a positive result (s) that would lead us to appropriate management. We should consider including VZV encephalitis in the differential diagnosis for all CNS manifestations in immunocompromised patients to avoid the delay in the diagnosis and early treatment.

Newly onset severe headache that mimics status migraine in the setting of immunocompromised status raises a red flag for VZV encephalitis. Untreated VZV encephalitis is uniformly fatal unless early treatment with acyclovir is initiated before extensive CNS tissue destruction ensues. We recommend that any immunocompromised patient with progressive encephalopathy be started on empiric treatment with acyclovir, particularly if there is an antecedent history of cutaneous zoster, until the diagnosis can be confirmed or ruled out by a definitive test for VZV.

### Author contributions

Drafting the manuscript: Shitiz Sriwastava, Anila Kanna, MD.  
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### Conflict of interest

There is no conflict of interest for the submitted case report.

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