

Case Report

Post Varicella Septic Vasculitis Presenting as Encephalopathy and Purpura in a Child: A Case Report

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Abstract: This case highlights a rare, but important complication of varicella infection in children- septic vasculitis presenting with purpura and neurological signs and symptoms mimicking meningitis. Clinicians should be aware that in post-varicella period, bacterial superinfection can lead to systemic features including vasculitis and encephalopathy, even in the absence of classical Central Nervous System (CNS) infection markers. Early recognition and prompt initiation of antibiotics are crucial for a favorable outcome. In our patient, the purpuric rash and altered sensorium raised suspicion of meningococemia, but normal cerebrospinal fluid (CSF) and Magnetic Resonance Imaging (MRI) findings, along with neutrophilic leukocytosis, elevated C-Reactive Protein (CRP) and a positive clinical response to antibiotics, supported a diagnosis of sepsis-associated vasculitis, likely secondary bacterial infection following varicella infection. Timely recognition and intervention by administering intravenous antibiotics led to complete resolution of the clinical condition in a short span.

Keywords: Varicella zoster, vasculitis, bacterial superinfection, encephalopathy, purpura.

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INTRODUCTION

Varicella is generally a self-limiting viral illness in children. However, secondary bacterial complications, though rare, can present with serious systemic manifestations[1, 2]. One such unusual complication is septic vasculitis, which may mimic meningitis or other CNS infections. Management of septic vasculitis includes administration of intravenous broad-spectrum antibiotics. This is different from varicella encephalitis where the main modality of treatment is parenteral acyclovir.

Varicella encephalitis is a rare but serious complication of primary varicella-zoster virus (VZV) infection, predominantly affecting children. It typically presents within 3-7 days of the onset of the characteristic vesicular rash and may manifest with altered sensorium, seizures, ataxia or focal neurological deficits. Secondary immune-mediated neurologic complications of varicella typically occur 1-3 weeks after the primary infection(3).

This case underscores the importance of maintaining a broad differential diagnoses in febrile children with rash and neurological symptoms, especially in the context of recent viral exanthems.

Septic vasculitis should be considered in the differential diagnoses of children presenting with fever, rash and neurological symptoms following varicella.

CASE PRESENTATION

We report a case of a 4-year-old male child who was not vaccinated for varicella, presented with high grade fever, vomiting, altered sensorium of acute onset (12-14 hours). There was no history of seizures, recent travel, drug intake or exposure to toxins. He had a history of varicella infection 20 days prior for which the parents have taken home remedies in the form of application of turmeric and neem leaves. On examination, he had nuchal rigidity and positive Kernig's sign. He notably had multiple tiny purpuric rashes over face and trunk; these rashes were non-blanching. There were also widespread healed rashes of chickenpox infection. The purpuric rashes were present over the extremities too the next day. They were asymmetrical in distribution. There was no joint involvement or abdominal symptoms.

Initial differentials included bacterial meningitis, post varicella encephalitis, post varicella immune vasculitis and post-varicella septic vasculitis. Laboratory investigations revealed neutrophilic

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leukocytosis and elevated CRP with normal ANA levels. CSF, MRI brain and spine, coagulation profile were normal. Blood cultures were sterile. Urinalysis was normal.

The child was empirically started on intravenous ceftriaxone and vancomycin considering the possibility of bacterial sepsis. Over the next 48-72 hours, there was marked improvement in sensorium, resolution of fever and gradual resolution of the purpuric rashes. The antibiotics were continued for a total of 7 days. The child responded dramatically to intravenous antibiotics and the purpuric rash resolved within 5 days of initiating the treatment. Based on the clinical presentation, timing and therapeutic response, a diagnosis of post-varicella septic vasculitis was made.

DISCUSSION

Varicella, caused by the varicella zoster virus (VZV), is typically a benign self-limiting illness in children. It usually resolves without serious sequelae. However, skin barrier disruption due to vesicular lesions can predispose children to secondary bacterial infections, particularly with *Staphylococcus aureus* and *Streptococcus pyogenes* [3]. These infections range from superficial skin involvement such as impetigo, cellulitis to invasive diseases like pneumonia, septicemia, necrotizing fasciitis and rarely, septic vasculitis. This condition can present with diagnostic challenges [4].

Septic vasculitis refers to inflammation and destruction of small vessels due to systemic bacterial

infection. It may occur due to direct microbial invasion of the vessel walls or as a result of immune complex-mediated damage. Clinically it is characterized by the presence of non-blanching purpura or petechiae, and in some cases, neurological involvement mimicking meningoencephalitis, often in the setting of fever and systemic illness. While *Neisseria meningitidis* is a classical cause [5], *Staphylococcus aureus* and *Streptococcus pyogenes* are increasingly recognized, especially in post-varicella cases.

In our patient, the appearance of purpuric lesions in the context of recent varicella raised suspicion of purpura fulminans or meningococemia [6], but these were ruled out based on clinical progression and investigation findings. Notably, the purpura was not associated with coagulopathy and the coagulation profile remained normal throughout. The absence of hypotension, rapid deterioration or disseminated intravascular coagulation (DIC) also made fulminant sepsis less likely [7].

The child's neurological findings- fever, nuchal rigidity, altered sensorium- initially mimicked meningitis or viral encephalitis. However, the normal CSF analysis and normal MRI of the brain and spinal cord pointed against a primary CNS infection. The constellation of findings suggests a diagnosis of sepsis-associated encephalopathy or post-infectious inflammatory response [8, 9]. Difference between septic and immune vasculitis [10] is depicted in the table below.

Feature	Septic vasculitis	Immune vasculitis
Cause	Infection (usually bacterial)	Autoimmune/ Inflammatory
Rash	Purpura, petechiae; asymmetrical distribution	Palpable purpura (commonly on legs), often symmetrical
Fever	High-grade, acute	Often low-grade or absent
Skin biopsy (if done)	Neutrophilic infiltrates, no immune deposits	Immune complex deposition
Response to antibiotics	Rapid improvement	No change unless treated with steroids/ immunoglobulins

Although skin biopsy is the gold standard for confirming vasculitis, it was not performed in this case due to clinical improvement. The prompt response to antibiotics, both in terms of resolution of fever and disappearance of purpura, further supports the diagnosis of septic vasculitis secondary to bacterial superinfection in a post-varicella setting.

CONCLUSION

Vaccination against varicella has dramatically reduced the incidence, severity and secondary complications, especially in children [2]. Immunized children who develop breakthrough infections typically experience much milder forms of the disease with significantly fewer complications. Hence, creating awareness about the importance of varicella vaccination among the general public is of utmost importance. Also,

this case underscores the importance of considering bacterial superinfection and septic vasculitis in the differential diagnosis of children presenting with purpura and neurologic signs following a recent viral illness.

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