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Fatal Necrotic-Hemorrhagic Varicella in an Immunocompromised Patient Receiving Chemotherapy: A Case Report

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Abstract **Case Report**

Varicella is usually a mild illness in immunocompetent children, but in immunocompromised hosts it can evolve into a severe necrotic-hemorrhagic form, with systemic viral spread and potentially fatal bacterial superinfection. We describe a 19-year-old man receiving chemotherapy for a knee sarcoma with pulmonary metastases, who presented with an abrupt febrile eruption of generalized umbilicated necrotic lesions and hemodynamic instability. A clinical diagnosis of necrotic-hemorrhagic varicella was made. Despite intensive care management with intravenous acyclovir, vasopressors and broad-spectrum antibiotics, his course was complicated by fatal septic shock. Necrotic-hemorrhagic varicella is a rare and serious presentation that arises mainly in immunocompromised patients. Any febrile rash in a patient on chemotherapy calls for close attention and early treatment.

Keywords: Necrotic-Hemorrhagic Varicella, Varicella-Zoster Virus, Immunosuppression, Septic Shock, Chemotherapy.

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INTRODUCTION

Varicella is the primary infection caused by the varicella-zoster virus (VZV). It is generally benign in immunocompetent children, but its severity increases in adults and in patients with impaired cellular immunity. In immunocompromised hosts, uncontrolled viral replication may lead to disseminated disease with visceral involvement and a hemorrhagic or necrotic rash, and the damaged skin exposes patients to bacterial superinfection that can be fatal.

We report a young immunocompromised patient who developed necrotic-hemorrhagic varicella complicated by fatal septic shock.

CASE REPORT

This retrospective case was collected in the emergency department of the military hospital of Guelmim and subsequently in the intensive care unit. [Ethics committee approval and informed consent statement to be completed by the authors.] A 19-year-old man was being treated for a knee sarcoma with pulmonary metastases, with chemotherapy since 2021 and radiotherapy since 2024. He presented to the emergency department with a febrile skin eruption of sudden onset, ten days after his last chemotherapy cycle.

On admission he was alert and febrile (39.9 °C). Blood pressure was 60/30 mmHg, heart rate 130 beats/min, and oxygen saturation 96% on room air. Skin examination showed pruritic, umbilicated, necrotic lesions distributed over the entire body, with sparing of the mucous membranes (Figure 1). On the basis of this examination, necrotic-hemorrhagic varicella was diagnosed.

He was admitted to the intensive care unit because of hemodynamic instability. Norepinephrine was started for hypotension that persisted despite fluid resuscitation, and intravenous acyclovir was begun. Laboratory tests showed leukopenia and a C-reactive protein (CRP) level of 320 mg/L, and he was given imipenem and amikacin.

Despite intensive care management, his condition worsened. He developed septic shock in the setting of necrotic-hemorrhagic varicella and died.



Figure 1: Clinical photographs showing umbilicated necrotic-hemorrhagic lesions of the upper limb (A), lower limb (B) and foot (C)

DISCUSSION

Overall mortality from varicella is low, but it is higher in adults than in children [1], and the risk is greatest in patients with impaired cellular immunity, including those treated for malignancy [2–4]. Early series of children with cancer had already described disseminated and sometimes fatal varicella [2]. Our patient represents the most severe end of this spectrum.

Several factors probably contributed to the severity of the infection: progressive sarcoma with lung metastases, prolonged chemotherapy since 2021, and radiotherapy since 2024. The rash appeared ten days after the last chemotherapy cycle, a time when chemotherapy-induced myelosuppression is often at its nadir, and leukopenia was documented in our patient. His exposure history and varicella immune status were not available.

In immunocompromised patients the eruption is often more extensive and prolonged, and the vesicles may become hemorrhagic, necrotic and umbilicated [4, 5], as seen here (Figure 1). In a febrile patient on chemotherapy, the differential diagnosis of a necrotic-hemorrhagic rash includes bacterial or fungal sepsis with ecthyma gangrenosum, purpura fulminans, disseminated herpetic infection and drug eruptions. Virological confirmation, notably by PCR on vesicular fluid, is generally desirable when available. In our patient the diagnosis was clinical.

Necrotic skin lesions break down the cutaneous barrier and favor bacterial superinfection; group A streptococcus is a well-known complication of varicella [6, 7]. In a leukopenic host, Gram-negative bacteremia is also a concern, which justified broad-spectrum cover with imipenem and amikacin. Our patient developed septic shock with a CRP of 320 mg/L, but no microbiological documentation is available. Management of septic shock rests on early broad-spectrum antibiotics, fluid resuscitation and norepinephrine as the first-line vasopressor [8], which corresponds to the care delivered here.

Intravenous acyclovir is the standard antiviral treatment of varicella in immunocompromised patients and should be started as early as possible [3,4]. In our patient acyclovir was started on admission, yet the outcome was fatal. This suggests that antiviral therapy may be insufficient once dissemination and septic shock are established, and it underlines the value of early consultation and of starting treatment without waiting for confirmation whenever varicella is suspected in a patient on chemotherapy.

Prevention is essential in this population. The live attenuated varicella vaccine is contraindicated in severely immunocompromised patients; prevention relies on determining VZV immune status before immunosuppression begins, on vaccinating susceptible patients and their close contacts whenever possible, and on post-exposure prophylaxis for susceptible patients who are exposed [4-9]. Patients on chemotherapy should also be told to report promptly any contact with a person who has chickenpox or shingles, and any new rash.

This report has the limitations inherent to a single case. Virological confirmation, skin biopsy, microbiological documentation (blood cultures), platelet count and coagulation tests, and autopsy data are not part of our record, and the interval between rash onset and death was not recorded. Primary infection could not be formally distinguished from disseminated reactivation. Nevertheless, this case illustrates how severe necrotic-hemorrhagic varicella can be in immunocompromised patients and why early recognition and treatment matter.

CONCLUSION

Necrotic-hemorrhagic varicella is a rare and serious form of the disease, occurring mainly in

immunocompromised patients and carrying a high risk of superinfection and life-threatening septic shock. This case highlights the need for heightened vigilance and early management of any febrile rash in a patient receiving chemotherapy.

Conflict of Interest: The authors declare no conflict of interest.

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