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Medical Imagery

Generalized cowpox virus infection in an immunosuppressed patient

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Two weeks prior to the initial presentation of a 32-year-old kidney transplant patient, his cat developed ulcerating nodules and passed away. He was scratched by his cat several times and developed flu-like symptoms and a skin lesion on his right hand, which rapidly progressed. Skin biopsy and real-time PCR confirmed the diagnosis of cowpox (CPXV) infection. The patient continued to receive triple immunosuppression until referral to the high-level isolation unit at our treatment centre for high-consequence infectious diseases on day 10 after disease onset. The lesions had progressed to disseminated hemorrhagic papules on up to 70% of the total body surface area, also involving the mucous membranes and resembling the full clinical picture of purpura variolosa (Figure 1). For clinical management, effective protective measures – including appropriate personal protective equipment (liquid-tight coverall, double gloving, face shield, FFP-3 mask) and negative pressure in the treatment room – were used in order to avoid transmission to the treating staff.

The patient had high viremia at all times, as well as directly detectable CPXV DNA in his urine, bronchoalveolar lavage and cerebrospinal fluid. All immunosuppressive agents except steroids were discontinued, and experimental antiviral therapy with tecovirimat 600 mg BID was started on day 13 (Grosenbach et al., 2018; Russo et al., 2021). Daily serum CPXV PCR testing showed a stagnation of viral load after an initial increase (Supplementary Figure). High anti-orthopoxvirus IgG and IgM antibody titers were detected. With further disease progression, including severe damage to the respiratory tract, vaccinia immune globulin (VIG) was also applied without any evidence of clinical improvement. Antibiotic therapy for bacterial superinfections (*Stenotrophomonas maltophilia* and *Enterococcus faecalis)* was commenced with intravenous trimethoprim/sulfamethoxazole and daptomycin. Unfortunately, the patient died in refractory septic shock on day 23. Postmortem analyses of organ samples revealed high levels of CPXV DNA in all tissues that were investigated. An ESBL-producing *Escherichia coli* strain was detected in blood cultures, which had been taken on days 20 and 21.

Usually, human cowpox is transmitted by cats or rats and presents as a self-limited disease with single, localized lesions. Severe cases with viremia are extremely rare and occur almost exclusively in immunocompromised patients with a high probability of fatal outcomes (Gazzani et al., 2017). We recommend immediate cessation of immunosuppression after diagnosis of

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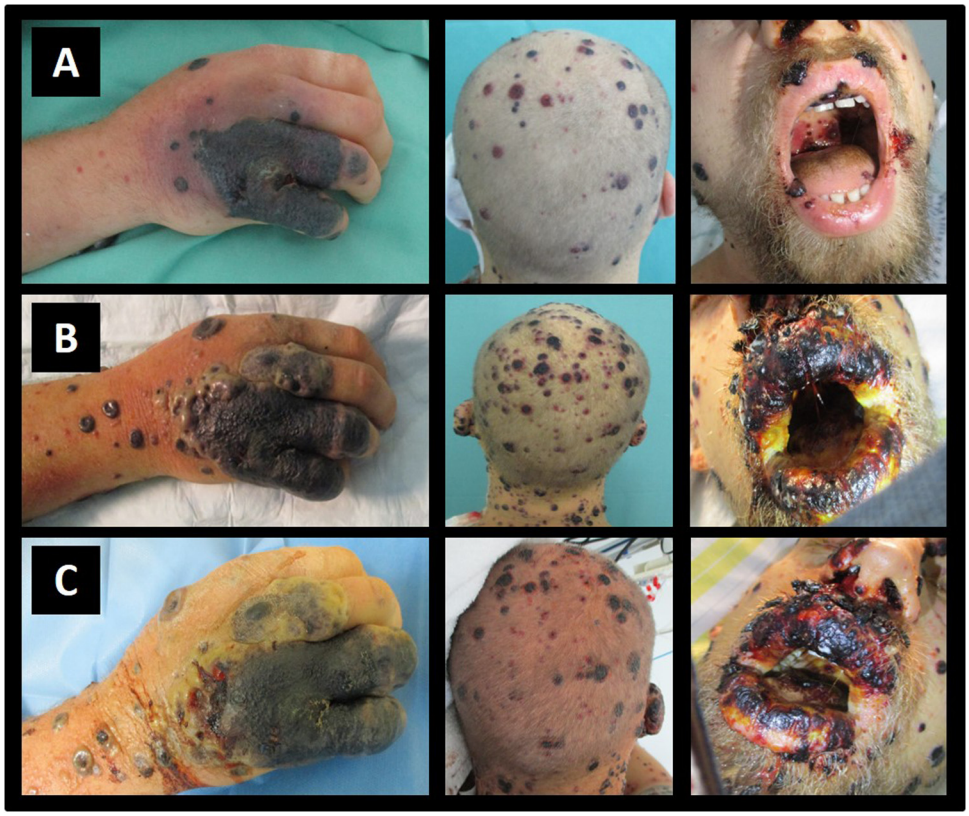

Figure 1. Cowpox infection-induced lesions on the right hand, skull and open mouth, taken on day 13 (A), day 19 (B) and day 21 (C) after disease onset.

cowpox infection, even in early, localized stages. Finally, this case is a reminder that CPXV infections are an emerging health threat (Vorou et al., 2008), which in principle can be treated with tecovirimat.

Disclosure

The authors declare no financial or other relations that could lead to a conflict of interest.

Author contributions

RW, JT, NK and SS cared for the patient. JT and SS diagnosed the patient. RW and CL drafted the manuscript. LS, JM and AN performed the virological analyses and advised treatment. BR coordinated the logistics of this case, including availability of the experimental drugs. All authors contributed to the management of the patient. All authors read and approved the final manuscript.

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Ethical approval

Patient data were anonymized.

Patient consent

Obtained (from the patient's wife).

Declaration of Competing Interest

The authors report no declarations of interest.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.ijid.2021.03.076.

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