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Fatal Alaskapox Infection in a Southcentral Alaska Resident

Background

Orthopoxviruses are double-stranded DNA viruses, and many are zoonotic, occurring in a range of mammalian taxa.¹ Alaskapox virus (AKPV) is a recently discovered orthopoxvirus that was first identified in an adult living near Fairbanks in 2015.²

Seven AKPV infections to date have been reported to the Alaska Section of Epidemiology (SOE). Until December 2023, all reported infections occurred in residents of the Fairbanks area and involved self-limiting illness consisting of a localized rash and lymphadenopathy.³ Small mammal testing in the Fairbanks area identified evidence of current or prior AKPV infection in four different species (though mostly in red-backed voles).⁴ Evidence suggestive of prior AKPV infection has also been documented in at least one domestic pet linked to a patient. The extent of AKPV's geographic distribution and animal reservoirs remain unknown. This *Bulletin* describes a recently reported fatal case of Alaskapox in a resident of the Kenai Peninsula.

Case Report

In mid-September 2023, an elderly man from the Kenai Peninsula with a history of drug-induced immunosuppression secondary to cancer treatment noted a tender red papule in his right axilla. Over the next 6 weeks, he presented to his primary provider and the local emergency department (ED) several times for clinical evaluation of the lesion and was prescribed multiple antibiotic regimens. A punch biopsy revealed no evidence of malignancy or bacterial infection. Despite antibiotic therapy, the patient experienced fatigue and increasing induration and pain in the right axilla and shoulder. On November 17, he was hospitalized due to extensive progression of presumed infectious cellulitis that impacted the range of motion of his right arm. The patient was subsequently transferred to a hospital in Anchorage.

In Anchorage, the patient complained of severe neuropathic-type burning pain. The prior biopsy site in the right axilla was non-healing and draining copious serous fluid with a surrounding gray coalescent plaque. Computed tomography and magnetic resonance imaging revealed extensive myositis involving his right axilla and shoulder musculature. Four smaller pox-like lesions were also present in diffuse locations across his body.

An extensive battery of laboratory tests was performed to discern the cause of the infection, including a plasma microbial cell-free DNA sequencing assay performed by Karius, Inc. The test was initially reported as positive for cowpox virus based on viral sequence comparison on December 8. A lesion swab was sent to the Alaska State Public Health Laboratory for subsequent testing; it tested positive on a generic orthopoxvirus polymerase chain reaction (PCR) assay but negative on a non-variola orthopoxvirus PCR assay (which ruled out cowpox, mpox, and vaccinia viruses, but not AKPV). A lesion swab subsequently submitted to the Centers for Disease Control and Prevention (CDC) was consistent with AKPV; the genome sequence was phylogenetically distinct from prior Fairbanks AKPV isolates.

Treatment with intravenous tecovirimat, intravenous vaccinia immunoglobulin (VIGIV), and oral brincidofovir was initiated. Approximately 1 week into therapy, his condition began to improve with plaque recession, reduced erythema, and subsequent epithelization around the axillary lesion. However, despite intensive medical support in a long-term care setting, he later exhibited delayed wound healing, malnutrition, acute renal failure, and respiratory failure. He died in late January 2024.

The patient resided alone in a forested area and reported no recent travel and no close contacts with recent travel, illness, or similar lesions. He reported caring for a stray cat at his residence

that regularly hunted small mammals and frequently scratched the patient, including one notable scratch near his right axilla in the month prior to rash onset. The patient did not report other recent contact with small mammals but did report gardening in his backyard through September 2023. Serum and mucosal swabs collected from the stray cat were submitted to CDC for antibody and orthopoxvirus testing; all tests were negative.

Discussion

This is the first case of severe Alaskapox infection resulting in hospitalization and death. The patient's immunocompromised status likely contributed to illness severity. Moreover, being the first case of Alaskapox identified outside of the Interior region, it indicates that AKPV appears to be more geographically widespread in Alaska's small mammals than previously known and warrants increased statewide awareness among clinicians. The route of exposure in this case remains unclear, although scratches from the stray cat represent a possible source of inoculation through fomite transmission. SOE is working with the University of Alaska Museum and CDC to test small mammals for AKPV outside of the Interior region.

Recommendations

1. Clinicians should become familiar with the clinical features of Alaskapox and consider testing for orthopoxvirus infection in patients with a clinically compatible illness.²⁻⁴
2. Promptly report suspected Alaskapox cases to SOE at 907-269-8000; SOE staff can help facilitate testing.
3. Advise outpatients with suspected Alaskapox to avoid touching lesions, keep lesions dry and covered, practice good hand hygiene, avoid sharing cloth that might have been in contact with lesions, and launder clothing and linens separately from other household items.⁵
4. Consider prescribing antiviral and VIGIV therapy for immunocompromised Alaskapox patients or those with progressive disease. SOE can assist in obtaining clinical consultations with CDC for access to therapeutics.
5. Hospitalized Alaskapox patients with immunosuppression should be placed under contact precautions. While human-to-human transmission of AKPV has not yet been observed, some orthopoxviruses can spread by direct contact with lesions (particularly broken skin contact with secretions).
6. Immunocompromised clinical staff with broken skin who have either had direct contact with Alaskapox lesions or handled soiled linen or dressings without proper use of personal protective equipment can be offered post-exposure prophylaxis with JYNNEOS™ vaccine.
7. Clinicians should photograph suspected poxvirus lesions to aid in clinical diagnosis; SOE staff and CDC poxvirus experts are available 24/7 to discuss suspected cases.
8. Alaskans should follow CDC guidelines for staying healthy around wildlife to prevent potential AKPV infections.⁶
9. Refer to the SOE Alaskapox website for more information: <https://health.alaska.gov/dph/Epi/id/Pages/Alaskapox.aspx>

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