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## Second Case of Novel Orthopoxvirus Infection in a Fairbanks-area Resident

### Background

In July 2015, a woman residing in the Fairbanks area developed a small (approximately 1 cm) ulceration with a whitish border on her right shoulder surrounded by erythema. She also experienced fever and fatigue. The treating physician suspected a viral infection. Ultimately, the lesion was found to be caused by an orthopoxvirus belonging to a previously undiscovered lineage.<sup>1</sup> The lesion fully resolved after about 6 months.

*Orthopoxvirus* is a genus of double-stranded DNA viruses that infect a variety of animals, including humans, cattle, cats, and rodents. There are likely many undiscovered species of *Orthopoxvirus* circulating in North American mammals.<sup>2</sup> The woman infected in 2015 had contact with small mammals and their droppings, but no molecular or serological evidence of orthopoxvirus infection was found in a taxonomically narrow sample of 12 small mammals trapped from her property.<sup>1</sup> The virus discovered in Alaska in 2015 is not closely related to other known orthopoxviruses. Virologists have proposed that the lineage represents a new species of *Orthopoxvirus*, which they named “Alaskapox virus”.<sup>3</sup>

In August 2020, a different woman who also lived in the Fairbanks area presented with similar symptoms. A small grey lesion appeared on her left upper arm, followed by erythema approximately 4 days later. She reported tender axillary adenopathy, shoulder pain, fatigue, and subjective fever at night. This patient’s lesion was deroofed and submitted to the US Centers for Disease Control and Prevention (CDC) for orthopoxvirus testing. The specimen tested positive on a generic orthopoxvirus PCR assay and sequencing confirmed that it belonged to the lineage identified in 2015.

### Methods

We interviewed the patient to obtain a detailed clinical history and to identify exposures, including travel history, any recent illness or skin lesions in household members, and contact with animals. We focused on the period 4 weeks prior to symptom onset; the incubation period for Alaskapox virus infection is unknown, but that of other orthopoxvirus infections is often 2 weeks or less.<sup>4</sup>

### Results

The patient had not traveled outside of Alaska for the past 3 years, but she did travel to Southcentral Alaska approximately 3 weeks before symptom onset. She reported that none of her family members or coworkers had any recent history of international travel. One other person resides with the patient and that person had no recent history of any illness nor any skin lesions. Likewise, the patient was unaware of any family members or coworkers with signs or symptoms similar to hers.

At the time of symptom onset, the patient lived with two cats. She reported that one of the cats captured and killed small mammals outside her residence, but the patient denied ever touching any of the small mammals. The patient also had regular contact with dogs owned by family members. The patient reported picking raspberries approximately 2 weeks before symptom onset. She said that she did not see any small mammals while berry picking.

The patient’s shoulder pain persisted for about 2 weeks after the onset of the skin lesion. Approximately 6 weeks after symptom onset, the patient reported that the lesion had substantially healed with only dry and scaled skin at the lesion site.

### Discussion

This is only the second known case of Alaskapox virus infection. Both occurred in residents of the Fairbanks area who did not have recent history of out-of-state travel. The respective symptom onset dates were more than 5 years apart and we did not identify any epidemiologic link between the cases.

Based on what is known about the epidemiology and ecology of other orthopoxviruses, and based on evidence from these two cases, we hypothesize that Alaskapox virus is most likely enzootic in one or more species of mammals in Interior Alaska and that humans are only occasionally infected. Both cases occurred during mid- to late summer in residents of forested areas near Fairbanks. While the similar time of year may be purely coincidental, it may also reflect the fact that small mammal populations are likely at or near their peak population size in late summer and that humans in Interior Alaska spend more time outdoors during the summer than other times of year.

The available evidence suggests that the public health impact of Alaskapox virus is limited. Importantly, there is no evidence of human-to-human transmission. The animal-to-human transmission route is unclear, but accidental inoculation of pre-existing breaks in the skin with infectious fomites is one possibility. It is reassuring that both known infections caused self-limiting illness. However, much remains unknown about the epidemiology and pathology of Alaskapox virus. Increased awareness among clinicians may lead to the identification of additional cases and thereby inform a fuller understanding of the incidence, risk factors, and spectrum of illness. The Alaska Section of Epidemiology is working with the University of Alaska Museum and CDC to look for a possible animal reservoir for the virus in the Fairbanks area.

### Recommendations

1. Follow routine precautions to prevent disease transmission between humans and wildlife.<sup>5</sup> These include: a) not handling wild animals, b) preventing wild animals from entering buildings, c) avoiding areas with lots of animal droppings, and d) washing hands regularly.
2. Providers should first rule out other common conditions (e.g., varicella zoster and herpes simplex viruses) before requesting poxvirus testing. If no alternative diagnosis is identified, providers should contact the Section of Epidemiology at 907-269-8000 for assistance in accessing poxvirus testing.
3. Persons with suspected orthopoxvirus lesions should be advised to keep the lesions dry and covered, to not touch them, and to not share with other people towels and other items that might come into contact with the lesion.<sup>6</sup>

### References

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