

ANIMAL AND HUMAN HEALTH PREVENTION OPPORTUNITIES

Contagious Ecthyma (Orf Virus Infection)

Contagious ecthyma, also known as orf or sore mouth, is a zoonotic disease of sheep, goats, and other domesticated and wild ruminants. Other species that can be infected include alpacas, camels, reindeer, musk oxen, bighorn sheep, deer, pronghorn antelope, and elk. The causative agent is orf virus, a member of the genus *Parapoxvirus* in the family Poxviridae. Orf virus is related to the viruses that cause pseudocowpox and bovine papular stomatitis. Even though animal and human orf virus infections are usually self-limiting, the clinical symptoms can be confused with those of other more serious diseases.

In this issue of *Montana One Health*, we describe a case of human orf virus infection, and the animal and human health implications of orf virus infections.

Case Report

A previously healthy veterinarian contacted the Centers for Disease Control and Prevention (CDC) to report two 4 mm indurated, pustular papules with an umbilicated center and purpuric appearance on the left index finger that developed approximately 1 week after treating an injured lamb. The veterinarian suspected the lesion to be contagious ecthyma, even though the lamb and other sheep in the herd appeared healthy. The patient sought care at an outpatient clinic and was placed on trimethoprim and sulfamethoxazole. After contacting the CDC, the patient sought care at another clinic where swabs from the lesion were taken for poxvirus testing. The CDC Poxvirus Laboratory detected orf virus DNA by polymerase chain reaction.

Almost 3 weeks after the onset of the primary lesion, the patient sought care at an emergency clinic for additional painful vesicular lesions on the hands and legs. The patient was placed on doxycycline pending results of rickettsial disease testing, an antihistamine, and oral and topical corticosteroids. All previous medications were discontinued. The health care provider submitted punch biopsies of the lesions. The lesions were found to be consistent with erythema multiforme or a drug reaction. The patient took medical leave and was lost to follow-up.

Animal Orf Virus Infections

Orf virus causes painful pustular lesions occurring primarily on the mouth and muzzle. Secondary locations affected by the virus can include teats, vulva, serotum, ears, and coronary bands. Pain associated with lesions can result in anorexia, abandonment of offspring, and lameness. Orf virus infections are typically self-limiting with the lesions resolving spontaneously. However, secondary bacterial infections requiring antibiotics can occur.

The orf virus is spread between animals and to humans by direct contact with infected animals or contact with contaminated fomites. The orf virus remains viable on wool and hides for about one month after the lesions have healed and is highly resistant to environmental inactivation. Both clinically normal and sick animals can shed orf virus.

The incubation period in small ruminants is 2–3 days with clinical signs persisting 1–4 weeks. The disease is most severe in young animals.

Diagnosis of orf virus infection is typically made based upon compatible clinical signs; however, scabs from suspected cases can be submitted for laboratory confirmation. No specific treatment exists for orf virus infections and supportive therapy is recommended. Animal orf virus vaccines are live virus preparations and are only recommended in previously infected herds/flocks. The vaccine will cause an orf infection in the animals and lead to contamination of the premise with virus-containing scabs.

Measures to prevent introduction of orf virus into a herd or flock include:

- Quarantine of new introductions
- Disinfection of equipment to prevent fomite transmission
- Isolation of affected animals

In Montana, orf virus infections are non-reportable and non-quarantinable. Interstate movement of infected animals is restricted to slaughter, a designated quarantine feedlot, or other premises for quarantine.

See **Table** for comparisons of animal and human orf virus infections.

Table. Characteristics orf virus infections in animals and humans.

	Animals	Humans
Incubation period	2–3 days	3–7 days
Mode of transmission	Direct contact, fomites	Direct contact, fomites
Clinical signs	Papules, pustules, vesicles	Papules that progress to pustules
Treatment	Supportive	Supportive
Course of disease	Self-limiting	Self-limiting
Complications	Anorexia, starvation, lameness, secondary bacterial infections	Secondary bacterial infections, bullous pemphigoid, erythema multiforme, toxic erythema
Vaccine	Yes	No
Important differential diagnoses	Foot and mouth disease	Cutaneous anthrax, tularemia, primary inoculation tuberculosis, eysipeloid, sporotrichosis

Human Orf Virus Infections

Human orf virus infections manifest typically as a solitary lesion or a few lesions on the hand (**Figure**). The clinical course of an orf virus infection has six stages 1) small erythematous lesion, 2) raised lesion with erythematous center and white ring, 3) weeping inflamed nodule, 4) early crusting lesion, 5) late crusting lesion, and 6) regressive lesion. Human orf virus infections are usually self-limiting in immunocompetent persons with healing occurring in 3–6 weeks. Complications can occur including secondary bacterial infections, bullous pemphigoid, erythema multiforme, toxic erythema, lymphadenopathy, and lymphangitis.

Transmission of the orf virus to humans can occur with exposure to infected or recently vaccinated animals and also by contact with contaminated fomites by abraded skin. Human-to-human transmission is rare. The incubation period for a human infection is 3–7 days.

Persons most at risk for an infection are veterinarians, meat handlers, butchers, and other persons with small ruminant contact. Activities associated with the greatest risk of infection

include contact with infected or recently vaccinated animals, handling contaminated equipment, handling animals with skin abrasions, improper handling of the vaccine, and butchering infected animals.

Prevention of orf virus infections includes proper personal protective equipment when handling small ruminants and good hand hygiene. Non-porous gloves should be worn when handling small ruminants or the vaccine. Persons exposed to small ruminants should practice good hand hygiene with frequent hand washing.

The clinical presentation of a human orf virus infection is similar to other infections and conditions, some of which are potentially life-threatening including cutaneous anthrax, tularemia, sporotrichosis, pseudocowpox, bovine popular stomatitis, primary inoculation tuberculosis, pyogenic granuloma, eysipeloid and neoplasia; therefore, a rapid definitive diagnosis is required. **History of animal exposure is not sufficient information to rule out other diagnoses.** The CDC can complete diagnostic testing for orf virus.

Contagious Ecthyma (Orf Virus Infection) Key Points

Human Health

- Persons handling small ruminants or the orf virus vaccine should wear proper personal protective equipment.
- Persons exposed to small ruminants who develop skin lesions should seek medical attention.
- Health care providers should perform diagnostic testing of skin lesions in persons with small ruminant exposure to determine a definitive diagnosis and exclude other more serious infections and conditions.
- If a health care provider suspects orf virus, they should contact the Montana Department of Public Health and Human Services regarding testing procedures.

Figure. Orf virus lesion



References available on web version. Visit <http://www.dphhs.mt.gov/publichealth/publications.shtml>.

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