

Blastomyces dermatitidis from a Needlestick Injury

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In the literature

Ghatage P, Pierce KK, Wojewoda C, et al. A veterinarian from Vermont presenting with a painful right index finger following a needlestick injury that occurred while caring for a dog. *Clin Infect Dis.* 2020;71(6):1577-1599.

FROM THE PAGE ...

Many occupational hazards (including animal bites, scratches, crushing and kicking injuries, and needlestick and other sharps injuries) can affect clinicians and veterinary staff. Needlestick injuries (NSIs) appear to be underdocumented but are common in the clinic, with most clinicians reporting at least 1 NSI, if not more, in their career.¹ Consequences of an NSI can include infection, local inflammation, localized necrosis, skin slough, nerve damage, allergic reaction, miscarriage, systemic effects, and/or even death.^{1,2} Zoonoses transmission via needlestick and sharps injuries has been associated with *Bartonella* spp, *Brucella abortus* RB51 vaccine, and *Blastomyces* spp, among others.¹⁻⁷ *Blastomyces dermatitidis* has also been transmitted via dog bites.⁸

In this case, a clinician suffered an NSI to the right index finger from a 21-gauge needle after aspirating fluid from a subcutaneous cystic mass in a dog with systemic blastomycosis. Swelling, tenderness, erythema, pain, and limited range of motion of the distal interphalangeal joint ensued. Purulent exudate was expressed from the finger during surgery, and biopsies were taken. Staining of tissues revealed broad-based budding between mother and daughter cells consistent with *B dermatitidis*, which was confirmed via isolation.

The usual method of infection in humans with *B dermatitidis* is via inhalation of the conidia, which transforms into the yeast phase and can spread hematogenously throughout the body.⁹ Humans may have no clinical signs, show nonspecific signs (eg, cough, fever, malaise, fatigue, weight loss), or develop more severe disease.⁹ Pneumonia is the most common manifestation of blastomycosis in humans, with skin lesions being next most common.⁹ Abscesses frequently form in the skin and subcutaneous tissues, but they can also form in the brain, bones, prostate, or other organs.⁹

Dogs and, less commonly, cats can develop *B dermatitidis* infection.¹⁰ Young, male dogs of sporting breeds are most commonly affected by blastomycosis. Signs may include dyspnea, tachypnea, fever, lethargy, weight loss, skin abscesses, uveitis, and pulmonary nodules.¹⁰

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1 NSI can result in zoonotic transmission or injection of substances (eg, vaccines, antimicrobials, chemotherapeutics, euthanasia solution).
- 2 Performing fine-needle aspiration or necropsy on a dog with *Blastomyces* spp infection can result in human infection if there is a needlestick or sharps injury.
- 3 Staff should be educated on safe sharps handling and possible adverse health outcomes.^{1,2} All NSIs should be recorded, and staff should be trained in human first aid and blood-borne pathogen awareness.

References

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Brief Summary: Before using NexGard® (afoxolaner) Chewables, please consult the product insert, a summary of which follows.

CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

Description: NexGard is a soft chewable for oral administration to dogs and puppies according to their weight. Each chewable is formulated to provide a minimum afoxolaner dosage of 1.14 mg/lb (2.5 mg/kg).

Indications: NexGard kills adult fleas and is indicated for the treatment and prevention of flea infestations (*Ctenocephalides felis*), and the treatment and control of *Ixodes scapularis*, *Dermacentor variabilis*, *Amblyomma americanum*, and *Rhipicephalus sanguineus* infestations in dogs and puppies 8 weeks of age and older, weighing 4 pounds of body weight or greater, for one month. NexGard is indicated for the prevention of *Borrelia burgdorferi* infections as a direct result of killing *Ixodes scapularis* vector ticks.

Dosage and Administration: NexGard is given orally once a month, at the minimum dosage of 1.14 mg/lb (2.5 mg/kg). See full product insert for dosing table and details.

Warnings: Not for use in humans. Keep this and all drugs out of the reach of children. In case of accidental ingestion, contact a physician immediately. Keep NexGard in a secure location out of reach of dogs, cats, and other animals to prevent accidental ingestion or overdose.

Precautions: Afoxolaner is a member of the isoxazoline class. This class has been associated with neurologic adverse reactions including tremors, ataxia, and seizures. Seizures have been reported in dogs receiving isoxazoline class drugs, even in dogs without a history of seizures. Use with caution in dogs with a history of seizures or neurologic disorders.

The safe use of NexGard in breeding, pregnant or lactating dogs has not been evaluated.

Adverse Reactions: In a well-controlled US field study, which included a total of 333 households and 615 treated dogs (415 administered afoxolaner; 200 administered active control), no serious adverse reactions were observed with NexGard.

Over the 90-day study period, all observations of potential adverse reactions were recorded. The most frequent reactions reported at an incidence of > 1% within any of the three months of observations are presented in the following table.

Table 1: Dogs with Adverse Reactions.

	Treatment Group			
	Afoxolaner		Oral active control	
	N ¹	% (n=415)	N ²	% (n=200)
Vomiting (with and without blood)	17	4.1	25	12.5
Dry/Flaky Skin	13	3.1	2	1.0
Diarrhea (with and without blood)	13	3.1	7	3.5
Lethargy	7	1.7	4	2.0
Anorexia	5	1.2	9	4.5

¹ Number of dogs in the afoxolaner treatment group with the identified abnormality.

² Number of dogs in the control group with the identified abnormality.

In the US field study, one dog with a history of seizures experienced a seizure on the same day after receiving the first dose and on the same day after receiving the second dose of NexGard. This dog experienced a third seizure one week after receiving the third dose. The dog remained enrolled and completed the study. Another dog with a history of seizures had a seizure 19 days after the third dose of NexGard. The dog remained enrolled and completed the study. A third dog with a history of seizures received NexGard and experienced no seizures throughout the study.

Post-Approval Experience (July 2018): The following adverse events are based on post-approval adverse drug experience reporting. Not all adverse events are reported to FDA/CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using these data.

The following adverse events reported for dogs are listed in decreasing order of reporting frequency for NexGard: Vomiting, pruritus, lethargy, diarrhea (with and without blood), anorexia, seizure, hyperactivity/restlessness, panting, erythema, ataxia, dermatitis (including rash, papules), allergic reactions (including hives, swelling), and tremors.

Effectiveness: See full product insert for details regarding Effectiveness.

Animal Safety: In a margin of safety study, NexGard was administered orally to 8 to 9-week-old Beagle puppies at 1, 3, and 5 times the maximum exposure dose for a total of six treatments. There were no clinically-relevant effects related to treatment on physical examination, body weight, food consumption, clinical pathology (hematology, clinical chemistries, or coagulation tests), gross pathology, histopathology or organ weights. Vomiting occurred throughout the study, with a similar incidence in the treated and control groups, including one dog in the 5x group that vomited four hours after treatment.

In a well-controlled field study, no adverse reactions were observed from the concomitant use of NexGard with other medications.

Contact Information: For a copy of the Safety Data Sheet (SDS) or to report suspected adverse drug events, contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or www.fda.gov/reportanimalae.

The information provided here is not comprehensive. The full FDA-approved product insert is available at www.nexgardfordogs.com. Consult your veterinarian for further information.

Product approved by FDA under NADA # 141-406

Marketed by: Frontline Vet Labs™, a Division of Boehringer Ingelheim Animal Health USA Inc. Duluth, GA 30096

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