

Esophageal Hiatal Size in Brachycephalic Breeds

Lisa Corti, DVM, DACVS

North Shore Veterinary Surgery

Andover, Massachusetts

In the literature

Conte A, Morabito S, Dennis R, Murgia D. Computed tomographic comparison of esophageal hiatal size in brachycephalic and non-brachycephalic breed dogs. *Vet Surg*. 2020;49(8):1509-1516.

FROM THE PAGE ...

The gastroesophageal junction (GEJ) is an important anatomic region composed of intrinsic and extrinsic components that help prevent gastroesophageal reflux (GER). These components (ie, lower esophageal sphincter [LES], esophageal hiatus [EH], diaphragmatic crura) work to create a high-pressure zone at the GEJ that prevents GER. In humans, enlargement of the EH has been correlated with sliding hiatal hernia, decreased LES pressure, and increased frequency of GER.^{1,2} The aim of this retrospective study was to characterize the EH via CT evaluation in brachycephalic and nonbrachycephalic dogs and to determine whether a difference exists that may predispose brachycephalic breeds to GER and sliding hiatal hernia.

Medical records of pet dogs that received thoracic and abdominal CTs were reviewed and divided into 2 groups. Group 1 consisted of brachycephalic breeds presented for upper airway, respiratory, and gastroesophageal conditions. Group 2 was composed of nonbrachycephalic breeds presented for reasons

unrelated to respiratory or gastroesophageal conditions. Axial images of the EH in each dog were combined to determine the circumference; a ratio of the cross-sectional areas of the EH and descending aorta (Ao) was then calculated (ie, EH:Ao ratio). Absolute EH measurements were also compared in weight-matched dogs from both groups.

Dogs in group 1 had a significantly higher EH:Ao ratio than dogs in group 2. This difference reflected significantly larger EH areas and smaller Ao dimensions in dogs in group 1. Further comparison of the weight-matched groups revealed that group 1 had a significantly larger EH area as compared with group 2.

Enlarged EH may be an additional anatomic difference that could explain why brachycephalic dogs have an increased risk for GER, sliding hiatal hernia, regurgitation, and aspiration pneumonia.³⁻⁵ This study did not assess EH function, and it is unknown whether enlarged EH alone leads to decrease in pressure across the GEJ. Of clinical importance is the increased risk brachycephalic breeds have for anesthetic complications, most commonly regurgitation and aspiration pneumonia.^{3,4} Many premedications and inhalant anesthetics decrease LES tone and gastric pH, which can further increase the risk for GER.⁶⁻⁹ Prolonged fasting for general anesthesia and surgery is also a risk factor for GER in humans¹⁰ and dogs.^{9,11} It is thus prudent to consider administration of antacids, prokinetics, and antiemetics—along with avoidance of prolonged fasting and use of certain anesthetic drugs—to help maintain LES tone, improve gastric motility, and decrease gastric secretions and acidity in brachycephalic dogs undergoing general anesthesia.^{3-5,8,9,11}

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1 Brachycephalic dogs are at increased risk for GER, sliding hiatal hernia, regurgitation, and aspiration pneumonia. Enlarged EH may be a contributing factor.
- 2 Brachycephalic dogs undergoing general anesthesia have higher morbidity and mortality rates than nonbrachycephalic dogs. Careful selection of anesthetic drugs, rigorous monitoring throughout the perioperative and postanesthetic periods, and quick staff intervention in case of a postoperative complication are required.
- 3 Pre-emptive treatment with antacids, prokinetics, and antiemetics may improve anesthetic outcomes in brachycephalic dogs. Consideration should be given to feeding a canned food meal at half the daily rate \approx 3 hours prior to surgery.

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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 chemistry, 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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