

Peer Reviewed

Recurrent GI Distress in a Young Dog

A 9-month-old neutered male Labrador retriever presented for diarrhea of 24 hours' duration.



HISTORY

The dog had a slightly decreased appetite but was drinking well with no episodes of vomiting. According to the owner, the dog had several bouts of large-bowel diarrhea over the past 24 hours. The dog lived in a suburban household and was rarely off-leash when outside. He ate a commercial dry food and did not receive any animal-based treats. He had a history of diarrhetic episodes from dietary indiscretion, including ingestion of excessive volumes of food and garbage eating. No such incidents were recently reported, but he was seen eating a dead bird from underneath a bird feeder in the owner's backyard.

CLINICAL PRESENTATION

The dog was somewhat quiet but alert and responsive. Vital parameters were within normal limits. Mucous membranes were normal with no evidence of dehydration. Borborygmi were increased but no abnormalities were detected on abdominal palpation. According to the owner, the dog had passed a moderate volume of unformed feces with a small amount of frank blood and mucus. A rectal examination was not performed, however.

LABORATORY RESULTS

A complete blood cell count was unremarkable, as was a serum biochemical profile. Fecal flotation was negative for ova and parasites. Large

numbers of rod-shaped bacteria were evident on a fecal smear, along with a smaller number of bacterial spores and spiral-shaped organisms. A fecal polymerase chain reaction (PCR) enteropathogen panel was submitted and was positive for *Clostridium perfringens* alpha toxin and *Salmonella* species, and negative for *Campylobacter* species and *Clostridium difficile*. The commercial laboratory conducting the tests did not provide additional information about actual target organisms or toxins.

Follow-up culture isolated both *C perfringens* and *Salmonella* species. *Campylobacter* culture was negative. *C difficile* toxin A/B ELISA was negative.

CONTINUES



ASK YOURSELF...

- What is the relevance of detecting *C perfringens* and *Salmonella* organisms by PCR testing?
- What do the fecal smear results indicate?
- What is the relevance of isolating *C perfringens* and *Salmonella* species?

ELISA = enzyme-linked immunosorbent assay, PCR = polymerase chain reaction



Table: Culture & Susceptibility Testing

Culture	Result/Characteristic
• Anaerobic culture	<i>Clostridium perfringens</i> ++
• <i>Campylobacter</i> culture	Negative
• <i>Salmonella</i> culture	<i>Salmonella</i> Typhimurium
• Susceptibility	<i>Salmonella</i> Typhimurium
Susceptibility*	
• Amikacin	Susceptible
• Ampicillin	Resistant
• Amoxicillin-clavulanic acid	Susceptible
• Cefazolin	Resistant
• Cefovecin	Susceptible
• Cefoxitin	Susceptible
• Cefpodoxime	Susceptible
• Ceftiofur	Susceptible
• Chloramphenicol	Susceptible
• Doxycycline	Resistant
• Enrofloxacin	Susceptible
• Erythromycin	Resistant
• Gentamicin	Susceptible
• Marbofloxacin	Susceptible
• Penicillin	Resistant
• Trimethoprin-sulfamethoxazole	Susceptible

*Susceptibility testing is not conducted on anaerobic organisms.

Public Health Concerns

Salmonella is a zoonotic pathogen that can be of particular concern for certain high-risk individuals (young, elderly, pregnant, immunocompromised).¹ In this case, there are 2 main concerns: exposure to *Salmonella* organisms from the source that infected the dog and exposure to *Salmonella* organisms from the dog's feces.

Salmonellosis is endemic in songbirds, with the potential for exposure of humans or pets. While salmonel-

losis from exposure to infected birds is more common in cats (ie, songbird fever), exposure to dogs is possible from ingestion of dead birds or potentially through contact with contaminated surfaces around bird feeders.

The owners were informed about measures to prevent zoonotic risks, particularly prompt removal of feces and attention to hand hygiene. They were advised to inform their physician about contact with the infected

dog and the potential for human illness.

Cleaning and soaking the bird feeder in a 10% bleach solution should reduce *Salmonella* contamination, and leaving the feeder down for 1 to 2 weeks can help prevent infected birds from congregating in the area.² To minimize the risk for exposure, the owners were advised to clean the feeder outside, wear disposable gloves, and wash their hands afterward.

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DIAGNOSIS: Salmonellosis

Based on culture and PCR results (Table), a presumptive diagnosis of salmonellosis was made.

It is suspected that the dog was exposed to *Salmonella* organisms by eating the dead bird. Upon further questioning, the owners reported seeing dead birds around the feeder over the past few weeks.

TREATMENT

Special therapy usually is indicated only in young puppies, immunocompromised dogs, or dogs with evidence of severe or extraintestinal disease.³ There is no evidence that antibiotics affect the progression of enteric salmonellosis, and the likelihood of clinically relevant bacterial translocation is very low in an otherwise healthy dog with mild disease. There is also concern, albeit unproven, that antimicrobials might prolong *Salmonella* shedding and increase the likelihood of antimicrobial resistance. Because the dog was systemically stable and had no unusual risk factors, no specific therapy was initiated. Food was withheld for 24 hours, followed by short-term feeding of a gastrointestinal diet. The owners were advised to monitor the dog's attitude and water intake to detect any signs of worsening disease.

Of note, there is no firm evidence that antibiotic treatment has an impact on shedding nor evidence that having any high-risk (elderly, pregnant, or immunocompromised) individuals in the household might change the approach to therapy. Both discussions, however, are beyond the scope of this article.

DID YOU ANSWER ...

- Because *Clostridium perfringens* is found in the vast majority of healthy dogs, its detection is of no diagnostic value.^{3,4} The *C perfringens* alpha toxin gene, the target of this PCR test, is present in all *C perfringens*. Finding it in a diarrheic dog provides no indication of its role in disease. In contrast, because *Salmonella* is uncommonly found in dogs that are not on a raw meat diet,⁵ its presence in a diarrheic dog provides a presumptive diagnosis of salmonellosis.
- Fecal smears are notoriously nonspecific, and no studies have shown their usefulness in diagnosing enteric bacterial infections.⁴ The rods that were evident were likely clostridial species, most of which are nonpathogenic. In addition, clostridia comprise a large and important component of intestinal microflora. Similarly, the presence of spiral-shaped organisms could indicate the presence of *Campylobacter*, but it could also represent various *Campylobacter*-like organisms such as *Arcobacter*, *Helicobacter*, or *Anaerobiospirillum* species.¹ Fecal smears also cannot differentiate pathogenic from nonpathogenic *Campylobacter* species.
- Isolation of *Salmonella* is relevant because of the known pathogenicity of the organism and the typically low prevalence of *Salmonella* shedding by healthy dogs.⁵ Isolation of *Salmonella* from a dog with diarrhea strongly suggests its role as the cause of disease. In contrast, *C perfringens* can be found in 80% or more of healthy and diarrheic dogs and therefore provides no indication of its role in that disease.^{4,6}

OUTCOME

The dog recovered uneventfully with no additional treatment. His appetite improved quickly and the diarrhea resolved completely within 48 hours. No further problems were encountered upon follow-up, and no disease was reported by people who resided in the household.

See Aids & Resources, back page, for references & suggested reading.