

Chronic Diarrhea in a Dog & Nutritional Implications

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THE CASE

Harvey, a 4-year-old intact male shar-pei, was referred for a 6-month history of weight loss despite good appetite, soft-to-watery diarrhea (ie, large volume, no increase in frequency, no blood or mucus, no tenesmus), and occasional vomiting. Harvey was up-to-date on vaccinations and had not traveled outside of his geographic location (ie, United Kingdom).

At presentation, Harvey was bright and alert with adequate hydration and a dry hair coat. The patient weighed 24 kg with a body condition score of 3/9 and moderate muscle mass loss. Mucous membranes were pink, and capillary refill time was <2.5 seconds. Temperature, pulse, respiration, thoracic auscultation, and lymph nodes were within normal limits. On abdominal palpation, small intestinal loops were described as fluid-filled and thickened.

Results of initial blood tests that were outside reference range included eosinophilia ($1.5 \times 10^9/L$ [range, 0.1-1.2]), albumin (2.4 g/dL [range, 2.7-4.5]), and globulins (1.8 g/dL [range, 1.9-3.4]).

Diagnostics and treatment by the previous veterinarian included fecal flotation for parasites (negative result) and treatment with sulfasalazine and metronidazole for 1 week (doses not reported). Slight improvement was reported by the referring veterinarian, but diarrhea recurred 2 months later.

Dietary History

Harvey's current diet consisted of commercial dry diet labeled *lamb and rice* (ie, wheat, lamb, rice, bran) fed free choice. His appetite was good, but no improvement in diarrhea was seen with any diet changes.

Previous diets (as indicated by the referring veterinarian and owner) tried before referral included a commercial, highly digestible dry food (ie, maize, gluten meal, chicken and turkey meal) fed free choice for 2 weeks and a premium dry food (ie, chicken, rice, maize, poultry meal, gluten meal, wheat, fish oil, egg) fed free choice for 2 weeks. There was no improvement with these diets, which were likely adult maintenance and over-the-counter.

Although the diets used were highly digestible, they did include several protein sources and were not appropriate as elimination diets. For instance, the first ingredient in the lamb and rice diet was wheat, so it is necessary to read the labels in full. Further, it was not apparent that other food sources were restricted while these foods were fed.

USG = urine specific gravity

TLI = trypsin-like immunoreactivity

For charts that help illustrate body and muscle condition scoring, access the **WSAVA Global Nutrition Council Nutrition Toolkit**: wsava.org/nutrition-toolkit

Patient scavenging and human treats impact any attempt at an exclusion diet trial; it is important to note, Harvey was likely not being treated with any flavored medications or flavored toothpaste. Clinicians should check for other potential added sources of allergens like these.

Further Testing

Urinalysis results showed a USG of 1.035, ChemStrip was unremarkable, and sediment included calcium oxalate crystals. The crystals were likely incidental or caused by fat malabsorption, as there was no evidence of uroliths and no signs or history consistent with ethylene glycol toxicity.

Other diagnostic test results included serum trypsin-like immunoreactivity (TLI; 7.8 $\mu\text{g/L}$ [range, 5-35]) and 3 fecal analyses that tested negative for parasites and enteropathogens (eg, *Salmonella*, *Yersinia*, *Campylobacter* spp). Abdominal radiographs showed increased intestinal gas. Bile acid stimulation test was within reference range. Basal cortisol was 110 nmol/L (>70 nmol/L rules out hypoadrenocorticism), folate was 5.5 $\mu\text{g/L}$ (range, 6.7-17.4), and cobalamin (B_{12}) was 27 ng/L (range, 225-660).

TLI within range suggested that endocrine pancreatic insufficiency was unlikely, and low folate and cobalamin were consistent with small intestinal disease and poor absorption.

Endoscopic examination of the stomach revealed apparently normal gastric mucosa, and samples taken for histopathologic examination were unremarkable. The small intestine, however, appeared roughened on endoscopic examination, and histopathology confirmed an eosinophilic duodenitis. Large intestine endoscopy and biopsy were not pursued, as signs were small intestine in origin.

DIAGNOSIS: **EOSINOPHILIC ENTERITIS**

Treatment & Follow Up

Treatment included Vitamin B₁₂ injections at 250 µg SC once a week for 2 months; fenbendazole at 50 mg/kg PO once a day for 3 days; and prednisone at 2 mg/kg PO in divided doses for 3 weeks initially, tapering once every 3 weeks by about 20% each time. For dietary management, the client strongly wished to continue feeding the lamb and rice dry diet.

At a follow-up appointment at 19 days, the client reported feeding a variety of foods, and Harvey, with no improvement in diarrhea, also had vomited after eating pancakes.

Recommended management included a restricted diet with a single novel protein source and possibly a single novel carbohydrate source. Another option would have been using a hydrolyzed diet. Many cases of inflammatory bowel disease (of which eosinophilic enteritis is one form) are now managed with hydrolyzed diets (sometimes with tylosin or metronidazole) prior to treatment with corticosteroids; this eliminates the need for corticosteroids in many cases.

Harvey was switched to novel single protein wheat-free diet (rice and fish). Wheat, which contains gluten, is not inherently more allergenic than other foods but was the ingredient to which this dog reacted.

For the next 3 months, progress was limited as the client continued to add human foods to the diet. (The dog vomited after being fed toast, despite the owner's explanation that it had only been the toast corners.) Follow-up included reinforcing the recommendation of feeding only the novel single protein, wheat-free food along with educating how the

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human foods added to the diet were counterproductive to Harvey's progress and improvement.

Conclusion

At 120-day checkup, the client had complied with the dietary recommendations and results included weight gain to 27.5 kg, variably soft-to-firm stools, increased strength, albumin and globulin results within normal range, and body condition score at 5/9 with muscle mass increased to normal.

A good diet history is essential, and examining labels is necessary to determine what food ingredients have been fed. It appeared that this patient may have had an adverse reaction to wheat, although the owner fed a variety of foods and other sources could have caused the reactions. The signs resolved on a restricted diet, and although a proper challenge was not performed, every time the owner fed a food containing wheat (eg, toast, pancakes), the dog demonstrated GI signs.

Consistent follow-up by the veterinary team on this case to ensure client compliance was also required, as the owner continued to feed human foods. Reinforcement of the veterinarian's recommendation and consistent education regarding the need for the recommended diet by the veterinary nurse were critical to this case. When there was compliance to a novel protein and carbohydrate diet, Harvey improved quickly.

ASK YOURSELF...

- Based on history, the origin of the diarrhea is most likely:
 - Large intestinal
 - Mixed small and large intestinal
 - Small intestinal
 - Rectal

Most accurate answer: C

The increase in volume without increased frequency, with no straining, mucus, or hematochezia plus the history of weight loss with a good appetite is consistent with diarrhea of small intestinal origin.

- How long is it usually necessary to feed an elimination diet to see if there is a dietary sensitivity effect on small intestinal diarrhea?
 - 2 days
 - 14 days
 - 6 weeks
 - 6 months

Most accurate answer: B

Unlike dermatological adverse reactions to food, dietary sensitive diarrhea usually responds within a couple of weeks, although some individuals may require several weeks. A food challenge is ideally conducted after response to determine the offending food, but some owners are reluctant to do this.

An in-depth nutritional history by the veterinary healthcare team—particularly the veterinary nurse—is of utmost importance in this case to determine protein sources to which the patient may have been exposed. An in-depth nutritional history helps the veterinarian prescribe a specific food that contains antigens the patient has not been exposed to earlier and therefore has not manifested with an adverse reaction. Open-ended questioning of the client regarding everything the patient eats and having the client bring in the label of the patient's current food help the veterinarian determine the best course of action regarding dietary management.

- A comprehensive nutritional history in suspected adverse reaction to food patients should include:
 - Treats the patient enjoys (including human food/table scraps)
 - Diet(s) fed
 - Other pets in the house
 - All of the above

Most accurate answer: D

All possible information is important to a nutritional history for patients with suspected adverse food reactions. The veterinary team must know what the patient is eating—including treats, diets, and the potential for getting other family pets' food.

- Which of the following is the most likely cause of a combination of decreased albumin and globulins?
 - Acute phase reaction due to inflammation
 - GI malassimilation (eg, inflammatory bowel disease)
 - Intestinal parasites
 - Hypoadrenocorticism

Most accurate answer: B

GI malassimilation is the most likely cause of a concurrent decrease in both albumin and globulins.

- Which vitamin deficiency is most common in dogs and cats with small intestinal disease and poor absorption?
 - Vitamin A
 - Vitamin B₁₂
 - Vitamin C
 - Vitamin E

Most accurate answer: B

Cobalamin (vitamin B₁₂) deficiency has been recognized in dogs and cats with chronic enteropathies and can result in severe metabolic abnormalities. Dogs and cats appear to be more susceptible than people to cobalamin depletion because they have a more rapid cobalamin turnover as a consequence of biliary excretion of cobalamin. ■