Animal Behavior Case of the Month

Statement of the Problem
A dog was evaluated because it chased and bit its tail at various times during the day. The behavior was increasing in severity; the dog had injured its tail and required medical treatment for the wound.

Signalement
The patient was a 2.5-year-old 37-kg (81-lb) neutered male German Shepherd Dog.

History
The dog had belonged to the owner since it was born; the same owner also owned the dam and 2 siblings. The dog was friendly and outgoing and did not seem to fear people or other dogs. The patient did not chase its tail until it was 7 to 8 months old. First, the owner noticed that the dog started spinning and trying to catch its tail when it was excited (eg, following play, when the doorbell was rung, or when offered a treat). The owner thought this was a type of play and allowed the behavior. Further, he encouraged and rewarded the dog for this behavior.

The patient's tail-chasing behavior increased in frequency and severity. The owner described the dog as playful and happy when the behavior problem started. However, at the time of the initial behavioral evaluation the owner described the dog as very intense. Initially, the dog had tail-chasing behavior during play and interactions with the owner; later, the behavior occurred at random times. Gradually, the dog lost weight; it seemed to lose interest in going on walks, playing, and getting attention, and it became irritable (eg, growling and snapping) when the owner tried to interrupt the tail-chasing behavior.

The owner tried to stop the tail chasing by punishing the dog when the behavior was observed (eg, verbal reprimands, spraying with water, and use of a choke collar); the punishments were not successful. Eight months prior to the behavioral evaluation, the patient had injured its tail by biting it multiple times. The primary care veterinarian treated the dog with a long-term course of antimicrobials, analgesics, and use of an Elizabethan collar. The veterinarian also prescribed amitriptyline hydrochloride (2.0 mg/kg [0.9 mg/lb], PO, q 24 h); however, that treatment did not improve the patient's behavior, and it was discontinued after 10 weeks. Additionally, the veterinarian suggested that the owner increase the dog's exercise and stimulation and recommended use of a basket muzzle to prevent physical damage to the tail. These treatments partially improved the behavior, but the patient continued to chase its tail and spin when it was left alone. Administration of corticosteroids (for treatment of possible pruritic conditions) did not improve the behavior.

The owner described the dog as having a poor quality of life. The dog was chasing its tail until it was exhausted, then ate a small amount of food and slept. The dog was not receiving any medications or behavioral treatments at the time of the initial behavioral evaluation. The patient's siblings and dam were healthy.

Physical Examination Findings and Laboratory Results
Physical examination and laboratory tests were conducted to rule out medical reasons for the dog's behavioral problem, such as neurologic or dermatologic diseases, and to determine baseline values of physiological variables prior to the potential use of medications. No physical abnormalities or sensory deficits were detected. Results of an orthopedic examination were unremarkable. Results of a CBC, serum biochemical and electrolyte analyses, urinalysis, and fecal examination were unremarkable. One week after the behavioral consultation, a neurologic examination (including MRI of the spine, abdomen, and pelvic area) was performed by a board-certified neurologist; findings were unremarkable. Results of a dermatologic examination including cytologic examination of a skin scraping and histologic examination of a skin biopsy specimen were unremarkable.

Diagnosis
On the basis of the patient's clinical signs (as determined by viewing a video recording of the behavior), history, and owner observations, a diagnosis of compulsive disorder was made. This behavior is repetitive and exaggerated and can occur out of context (ie, in situations for which tail licking and grooming are not behaviorally normal). The behavior developed over the course of several years; initially, it seemed random and could be easily interrupted, but then it developed into a very intense and virtually constant behavior. It likely started as an attention-seeking behavior or a frustration or conflict behavior (defined as behavior attributable to competing motivations such as desire to greet and play with the owner and fear of the owner) or because of a lack of stimulation. Medical conditions that caused pain or irritation may have contributed to the development of this behavior. In addition, because of a breed predisposition for German Shepherd Dogs, a genetic component was considered. The dog's behavior had a uniformly repeated motor pattern that could have been
consistent with a stereotypic behavior. However, the term compulsive behavior was more appropriate because the behavior was characterized by a fixation on a final goal (catching the tail) rather than the spinning activity. In some situations, the patient tried to chase its tail without spinning; for example, it would lie on the floor and turn toward its tail. Alternative behavioral diagnoses included anxiety or hyperactivity. On the basis of the owner's description and viewing of the video recordings, the patient did not have signs of anxiety (eg, avoidance of situations or locations, muzzle licking, yawning, or shaking) at any time or in any situations. Moreover, none of the tail-chasing episodes were linked to stimuli expected to provoke fear or anxiety. Furthermore, the dog did not have signs of hyperactivity (eg, tachycardia and tachypnea) or high metabolic activity.

Medical conditions that cause pain (eg, trauma, spinal abnormalities, or intervertebral disk protrusion) may elicit tail-biting behavior. Such behavior can be self-rewarded by the release of endorphins. Skin conditions such as pyoderma or those attributable to allergies or parasites may cause localized irritation leading to biting of an area by an animal. Internal or metabolic diseases (eg, hepatoencephalopathy, portosystemic shunts, or hyperparathyroidism) and intestinal parasites were also considered for the dog of the present report. Various infectious diseases such as canine distemper virus infection or hepatitis may lead to CNS problems resulting in seizures. In addition, primary CNS diseases such as epilepsy, meningitis, or spinal cord lesions may have a role in neuropathic pain or physiologically abnormal nerve activity or sensation. All medical differential diagnoses for the dog were ruled out on the basis of the unremarkable results of physical examination, laboratory testing, complete dermatologic examination (including cytologic analysis of a skin scraping and histologic analysis of a skin biopsy specimen), and neurologic examination (including MRI). Although performance of electroencephalography and evaluation of a CSF sample could have been useful, they were not performed because the neurologist indicated that such testing was unlikely to yield important results and because of cost.

The patient was calm during the behavioral consultation and responded appropriately to cues. Twice during the consultation, the dog started chasing its tail when it was not playing with toys or interacting with people. These episodes were short (< 1 minute) and were easy to interrupt by use of a verbal cue and a leash.

Treatment

The owner's treatment goal was to stop the dog's tail-chasing behavior and avoid further self-inflicted injuries. In addition, he was concerned about the dog's welfare. A treatment plan was prepared that included a behavior management program and drug treatments.

The behavior management program for the dog had 5 components. The owner was instructed to use a head collar to effectively and safely stop the dog's immediate tail-chasing behavior, and to continue use of a basket muzzle or Elizabethan collar for prevention of the behavior. He was advised to adhere to a predictable daily routine for the dog. All the dog's necessities (eg, food, exercise, attention, and training) were to be included in the daily routine. The owner was instructed to provide enrichment (eg, feeding toys) at times when the dog was most likely to chase its tail, and to avoid punishment of the dog. The owner was asked to keep a diary of the times when tail-chasing was most likely to occur and to record the duration of each episode of the behavior. Use of the diary would allow implementation of a predictable daily routine and enrichment schedule as well as evaluation of improvements in the dog's behavior.

Fluoxetine hydrochloride (1.1 mg/kg [0.5 mg/lb], PO, q 24 h) was administered to the dog. Fluoxetine, a selective serotonin reuptake inhibitor, was administered to increase extracellular concentrations of serotonin and thereby decrease the patient's motivation for the tail-chasing behavior. In addition, treatment with gabapentin (11 mg/kg [5 mg/lb], PO, q 12 h) was initiated. Gabapentin, an anticonvulsant, was prescribed after consultation with a neurologist for treatment of possible psychomotor seizures or neuropathic pain.

Follow-up

Weekly follow-up communications with the owner were conducted by telephone during the first 4 weeks after the behavioral consultation. The dog had no adverse effects attributable to the medications; however, the treatment did not seem to improve the behavior problem. The owner reported that the dog played with its toys and responded well to the new routine. Moreover, it was easier to stop the tail-chasing behavior than it had been before the behavioral consultation, although the frequency and duration of the behavior did not change. One month after the initial behavioral consultation, the dose of fluoxetine was increased (1.6 mg/kg [0.7 mg/lb], PO, q 24 h).

Four weeks later, the owner reported that the dog seemed to be calmer and no adverse effects attributable to medications had been observed. The frequency and duration of the tail-chasing behavior had decreased (from approx 1 hour 4 to 5 times daily to 30 minutes twice daily). The dog did not show aggression when the owner stopped the behavior. Furthermore, the dog's weight increased and it did not injure its tail, even after the owner removed the Elizabethan collar. Throughout the following 3 months, the owner continued the same daily routine and medications. Monthly follow-up communications with the owner were conducted by email.

Five months after the initial behavioral consultation, the dog was brought by its owner for a follow-up consultation. The dog was calm during the evaluation, and results of physical examination and sensory evaluation were unremarkable. Compared with observations before the initial behavioral consultation, the owner reported that the dog was calmer, engaged with the other dogs more often, and had gained weight (7 kg [15 lb]; the dog weighed 44 kg [96 lb] at the time of the follow-up consultation). At this time, the dog would stop chasing its tail in response to a verbal cue. However, it still had the behavior during the day without any apparent stimuli or pattern. After the behavior was interrupted, the dog calmed faster than it had before the start of the treatments. Information in the diary did not clearly indicate a pattern (stimuli, time of the day, or specific
location) for this behavior. Following this behavioral consultation, the dose of fluoxetine was again increased (1.8 mg/kg [0.8 mg/lb], PO, q 24 h). The owner was instructed to continue the treatment plan.

One month after the follow-up behavioral consultation, the owner reported that the dog's behavior had improved substantially. At that time, the patient rarely chased its tail (only twice during the month following the prior behavioral consultation) and had no adverse effects attributable to the medications. The dog's weight had increased by 2 kg (4.4 lb), and it seemed calmer and friendlier. At this time, the owner was instructed to taper the dose of gabapentin by 33% each week (on the basis of the advice of a neurologist) and to stop administration within 4 weeks.

Four weeks later, the dog's behavior was still improved. It was not receiving gabapentin at this time and had only chased its tail once (a brief episode of < 2 spins that it stopped voluntarily) since the time of the prior communication. The behavioral improvement in response to treatment with fluoxetine supported the initial diagnosis of compulsive behavior.

Three attempts were made to gradually wean the patient off fluoxetine over the following 6 months; however, these attempts were unsuccessful. After the dose of fluoxetine was reduced to 1.3 mg/kg (0.59 mg/lb), the dog's behavior problem worsened. Because the dog was calm and friendly, did not have any adverse effects of the drug, and did not chase its tail when receiving 1.4 mg of fluoxetine/kg (0.64 mg of fluoxetine/lb) daily, administration of the drug at that dosage was continued; a brand-name fluoxetine product was used instead of a generic product at this time.

Eighteen months after the initial behavioral consultation, the dog was doing well. At that time, it was still receiving 1.4 mg of fluoxetine/kg. It had what the owner described as a great life with excellent welfare, and no adverse effects of the drug had been noticed. In addition, physical examination findings and laboratory test results were unremarkable at that time.

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a. Reconcile, Elanco, Greenfield, Ind.

References