In cooperation with

Animal Behavior Case of the Month

Statement of the Problem

A dog was evaluated because of excessive arousal and fearful behavior when exposed to new people, animals, and objects inside and outside the home.

Signalment

The patient was a 3-year-old 60.6-kg (133.3-lb) neutered male Bouvier des Flandres.

History

The owners acquired the patient from a breeder when it was 3 months old. They lived in a house with a fenced yard in a suburban area. According to the breeder, the dog had been adequately exposed to environmental stimuli, unfamiliar people, and other dogs before the owners acquired it. The patient had moderately fearful behavior (crouching, ears held back, panting, and attempting to retreat) when exposed to novel stimuli since the time of the adoption; fearful behavior had progressively worsened. Among the dog's parents and 3 littermates, a male littermate also had fearful behavior when exposed to certain environmental stimuli. At the time of the behavioral evaluation, the owners reported that the dog barked, salivated, panted, paced, ran in circles, and had its ears back and pupils dilated when people or a vehicle passed by the house or when anything outdoors was different or unusual. When unfamiliar people entered the house, the patient ran to the living room to retreat and had fearful behavior. When attempting to retreat, the dog occasionally knocked the owners down. This fearful behavior persisted for up to 1 to 2 hours after the trigger was no longer present, and the dog did not respond to any distracting stimuli (ie, verbal cues or treats) during that time. When the environment was calm, the dog went nervously between windows, watching the outside in an alert state. During outdoor on-leash walks, the patient ran toward home when it encountered new or unexpected stimuli (eg, a car approaching), occasionally breaking away from the owner and going home on its own. Although the dog stayed a far distance away from unfamiliar dogs, it was not aroused when exposed to such dogs. In an attempt to improve the patient's behavior, the owners attended training classes and routinely exposed it to other people and dogs. The dog responded positively to reward-based training when it was calm, but not when highly aroused. The following drugs were administered: acepromazine maleate (0.4 mg/kg [0.18 mg/lb], PO, as needed) and fluoxetine hydrochloride (0.7 mg/kg [0.32 mg/lb], PO, q 24 h for 6 weeks) followed by amitriptyline hydrochloride (1.7 mg/kg [0.77 mg/lb], PO, q 12 h for 6 weeks). These drugs did not have an appreciable effect on the dog's behavior. At the time of the behavioral evaluation, the patient had been receiving alprazolam (0.05 mg/kg [0.023 mg/lb], PO, as needed when exposed to a predictable behavior trigger) and sertraline hydrochloride (1.7 mg/kg, PO, q 24 h) during the 3 months prior to the behavioral evaluation. Administration of alprazolam seemed to calm the dog when it was exposed to a trigger of mild intensity. Administration of sertraline alone did not have an appreciable effect on the dog's behavior, other than mild sedation.

Physical Examination Findings and Laboratory Results

During the behavioral evaluation, the patient panted and lay down on the floor near one of the owners with its ears held back against the head and the pupils dilated. The dog ate a few treats but was not interested in food toys. Physical examination findings and results of a CBC and select serum biochemical analyses performed by the referring veterinarian were unremarkable. Measurement of total T_4 (thyroxine) concentration and performance of a urinalysis were recommended, but the owner declined.

Diagnosis

Barking, salivating, panting, pacing, running in circles, ears held back, dilated pupils, and retreating from environmental stimuli were considered signs of excessive fear of unfamiliar people and environmental stimuli (neophobia)[1–3]; the behavior was also characterized by a lack of natural habituation (ie, the dog was repeatedly exposed to nonharmful environmental stimuli). For this reason, a diagnosis of extreme fear of unfamiliar people and phobia of environmental stimuli was made for the dog.[3–5] Phobia has also been defined as an excessive fear that compromises decision making.[6] The dog's retreat when it was exposed to threatening stimuli suggested that its decision-making ability was not compromised; therefore, excessive fear of environmental stimuli could also have been an appropriate diagnosis. For the hypervigilance behavior (visual scanning of the outside through windows) and because of the chronicity of the patient's behavior, a diagnosis of generalized anxiety was made.[4,a] Barking at people passing by the house and visual scanning of the outside through windows could have been consistent with territorial

This report was submitted by Carlo Siracusa, DVM, PhD; from the Department of Clinical Studies, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, PA 19104.
Address correspondence to Dr. Siracusa (siracusa@vet.upenn.edu).

aggression, but this differential diagnosis was rejected because the dog had overtly fearful behavior (escape) when people entered the house.[7] Avoidance and defensive behaviors can also be caused or exacerbated by pain and other medical problems including infection, metabolic disease, and brain lesions.[8,9] The unremarkable medical history, physical examination and laboratory test results, and consistent association between the dog's fear and novel or frightening stimuli suggested it was unlikely that phobia was associated with medical problems. Attention-seeking behavior was ruled out as a cause of barking, running in circles, and retreating because these behaviors and other fear-associated signs (eg, panting, dilated pupils, and keeping ears held back) were also displayed when familiar people were not present.[4] Although difficult to confirm, genetic predisposition to fears and phobias was also considered as a diagnosis; this was supported by the fact that one of the dog's siblings had signs of extreme fear.[2,5,10] Lack of appropriate socialization was less likely as a cause of the behavior problems because the breeder reported the dog was socialized when it was between 3 and 12 weeks old (socialization period).[5,11]

Treatment

To avoid incidents attributable to the patient's excessive arousal when frightened, recommendations regarding safety were made for the owners, which included removing the dog from the frightening situation and avoiding forced physical restraint. A leash was kept on the dog when it was indoors to facilitate removal from phobia-inducing situations when self-initiated retreat and redirection and response substitution techniques failed. It was essential that exposure to predictable frightening stimuli be avoided; recommendations included advising guests to call before their arrival, confining the dog in the living room, and avoiding outdoor walks for 8 weeks. The dog could have adequate exercise in the yard of the house.[3,4,12] The owners also received counseling regarding environmental and behavioral modification. They were instructed to create a safe place for the dog in the home where exposure to outside stimuli would be minimized by use of background noises (eg, radio, TV, or white noise machine) and visual barriers (eg, curtains and opaque contact paper on windows). Food-enhanced toys were to be used as counterconditioning devices.[3,13] Because the patient retreated to the living room when it was fearful, the owners were told to encourage it to spend time in the safe space by use of a go-to cue.[14] Relaxation exercises were recommended to reinforce the dog's calm behavior by means of classical conditioning (ie, the dog was rewarded every time it lay down, sat, or rested on a designated mat). Such exercises would be practiced with a down-stay verbal cue on a mat, so that the mat could be used as a safe spot when the dog was away from home.[14,15] Practicing the look cue was recommended as a redirection or response substitution technique in the presence of frightening stimuli, both indoors and outdoors.[14] If outdoor walking of the dog was needed, the owners were instructed to use a head collar[b] with metal buckle.[16,17] Systematic desensitization to frightening stimuli was not recommended during the first 8 weeks of treatment because of the severe intensity and high frequency of the patient's phobia episodes. After drug treatment and behavioral modification techniques were successful for reduction of the dog's level of arousal, desensitization to specific stimuli could be performed.[3,4,18] Punishment was to be avoided at all times.[4,5,11]

The drug treatment regimen for the patient was modified. Administration of sertraline was discontinued because of unsatisfactory results. A gradual decrease at a rate of 25% of the dose/wk was recommended,[19] but the owners requested a faster decrease. After a discussion of the increased risk of withdrawal symptoms, including increased anxiety and fear,[19] a 9-day schedule of decreasing doses for discontinuation of sertraline was prescribed (33% reduction in dose every 3 days). After a 2-day washout period (determined on the basis of available data regarding the half-life of sertraline),[19] treatment with clomipramine hydrochloride,[c] a tricyclic antidepressant, was to be initiated (1 mg/kg [0.45 mg/lb], PO, q 12 h for 7 days followed by 1.7 mg/kg, PO, q 12 h). A low initial dose and a maximum daily dose of 200 mg were used to minimize the risk of adverse effects.[18,20–22] Clomipramine[c] was chosen because it is licensed for use in dogs with anxiety-related behaviors (specifically separation anxiety) and has been used successfully for treatment of fearful behaviors and phobias in dogs.[18,23] Alprazolam was to be administered at a dosage of 0.05 mg/kg, PO, every 8 hours,[21,22] to provide antianxiety effects throughout each day. Although not licensed for use in dogs, alprazolam has also been used successfully to reduce the severity of fears and phobias in dogs.[23] The extralabel use of drugs was discussed with the owner.

Follow-up

Nine days after the behavioral evaluation, the owner reported that the patient had increased anxiety during the prior 3 days, when it was receiving the minimum planned dose of sertraline. The dog was calm for 5 to 6 hours after administration of alprazolam, but it was not effective for the entire 8-hour interval between doses. The owner was instructed to increase the frequency of administration of alprazolam (0.05 mg/kg, PO, q 6 h).[23,24] Two weeks after the behavioral evaluation, the patient had a quieter attitude. The dog was mildly sedated following administration of clomipramine, so the owners decided to return to the previous frequency of administration of alprazolam (0.05 mg/kg, PO, q 8 h) in an attempt to reduce sedation. After that change, the dog had a higher activity level but was more relaxed than it had been before the start of clomipramine treatment. The owners performed the recommended behavioral and environmental modifications. Although it seemed difficult for the patient to maintain attention during training exercises when it was aroused, the owners thought that the dog had improved.

Eight weeks after the behavioral evaluation, the patient was less likely to become aroused by outdoor stimuli and was easier to redirect by use of look or go-to cues. However, the dog was still unresponsive to cues when guests were visiting. The owners noticed a gradual but very positive change in the dog's behavior, but they felt that the rate of improvement had slowed

during the previous week. For this reason, they inquired about further changes in the drug treatment regimen; the alprazolam dosage was increased (0.07 mg/kg [0.032 mg/lb], PO, q 8 h).[21,22] The owners were instructed to start practicing systematic desensitization by means of controlled, progressive exposure to predictable frightening stimuli (eg, meeting people outdoors and grooming).[3,4,11,15]

Twelve weeks after the behavioral evaluation, improvement in the patient's behavior had continued. Although the dog panted and occasionally salivated, it was able to walk outside in public. The dog tolerated handling by a groomer and being left at a day care facility. It was still aroused (running in circles and barking) by guests visiting the home, but recovered faster after such visits than it had before treatment. The alprazolam dosage was increased again (0.08 mg/kg [0.036 mg/lb], PO, q 8 h).[21,22] Six months after the behavioral evaluation, the patient had further improvement in its behavior. The owners could satisfactorily control the dog's fear at home and outside. The dog was still aroused by visiting guests, but it was easier to distract and send to the designated safe place. A CBC and serum biochemical analyses were performed by the primary care veterinarian; all values were within reference limits. Although we recommended measuring total T_4 concentration and performing a urinalysis, these tests were not performed. The owners were instructed to continue the drug treatment regimen and to repeat laboratory tests in 6 months.

a. Reisner IR. Diagnosis of canine generalized anxiety disorder and its management with behavioural modification and fluoxetine or paroxetine: a retrospective summary of clinical experience (2001–2003) (abstr). *J Am Anim Hosp Assoc* 2003;39:512.
b. Gentle Leader with Metal Buckle, Premier Pet Products, Midlothian, Va.
c. Clomicalm, Novartis Animal Health US, East Hanover, NJ.

References

1. Overall KF. Normal canine behavior. In: *Clinical behavioral medicine for small animals*. St Louis: Mosby, 1997;9–44.
2. Jones AC, Gosling SD. Temperament and personality in dogs (*Canis familiaris*): a review and evaluation of past research. *Appl Anim Behav Sci* 2005;95:1–53.
3. Berger J. Animal behavior case of the month. *J Am Vet Med Assoc* 2009;234:332–334.
4. Nielson J. Fear of places and things. In: Horwitz D, Mills D, Heath S, eds. *BSAVA manual of canine and feline behavioural medicine*. Gloucester, England: British Small Animal Veterinary Association, 2002;173–193.
5. Overall KF. Fear, anxiety and stereotypies. In: *Clinical behavioral medicine for small animals*. St Louis: Mosby, 1997;209–250.
6. Rogerson J. Canine fears and phobias; a regime for treatment without recourse to drugs. *Appl Anim Behav Sci* 1997;52:291–297.
7. Landsberg G, Hunthausen W, Ackerman LF. Canine aggression. In: Landsberg G, Hunthausen W, Ackerman LF, eds. *Handbook of behavior problems of the dog and cat*. 2nd ed. London: Elsevier, 2003;385–426.
8. Fatjo J, Bowen J. Medical and metabolic influences on behavioural disorders. In: Horwitz D, Mills D, eds. *BSAVA manual of canine and feline behavioural medicine*. 2nd ed. Gloucester, England: British Small Animal Veterinary Association, 2009;1–9.
9. Overall K. Medical differentials with potential behavioural manifestations. *Vet Clin N Am Small Anim Pract* 2003;33:213–229.
10. Casey R. Fear and stress. In: Horwitz D, Mills D, Heath S, eds. *BSAVA manual of canine and feline behavioural medicine*. Gloucester, England: British Small Animal Veterinary Association, 2002;144–153.
11. Landsberg G, Hunthausen W, Ackerman LF. Fear and phobias. In: Landsberg G, Hunthausen W, Ackerman LF, eds. *Handbook of behavior problems of the dog and cat*. 2nd ed. London: Elsevier, 2003;227–268.
12. Pryor P. Animal behavior case of the month. *J Am Vet Med Assoc* 2003;223:790–792.
13. Overall K. Noise phobia in dogs. In: Horwitz D, Mills D, Heath S, eds. *BSAVA manual of canine and feline behavioural medicine*. Gloucester, England: British Small Animal Veterinary Association, 2002;164–172.
14. Landsberg G, Hunthausen W, Ackerman LF. Training: behavior modification techniques. In: Landsberg G, Hunthausen W, Ackerman L, eds. *Handbook of behavior problems of the dog and cat*. 2nd ed. London: Elsevier, 2003;91–116.
15. Overall KF. Appendix B: client handouts. In: *Clinical behavioral medicine for small animals*. St Louis: Mosby, 1997;408–491.
16. Landsberg G, Hunthausen W, Ackerman LF. Prevention: the best medicine (guide to crate/confinement training). In: Landsberg G, Hunthausen W, Ackerman LF, eds. *Handbook of behavior problems of the dog and cat*. 2nd ed. London: Elsevier, 2003;27–71.
17. Overall KF. Treatment of behavioural problems. In: *Clinical behavioral medicine for small animals*. St Louis: Mosby, 1997;274–292.
18. Crowell-Davis SL, Murray T. Tricyclic antidepressants. In: *Veterinary psychopharmacology*. Ames, Iowa: Blackwell Publishing, 2006;179–206.
19. Crowell-Davis SL, Murray T. Selective serotonin reuptake inhibitors. In: *Veterinary psychopharmacology*. Ames, Iowa: Blackwell Publishing, 2006;80–110.
20. Overall KL. Use of clomipramine to treat ritualistic stereotypic motor behavior in three dogs. *J Am Vet Med Assoc* 1994;205:1733–1741.
21. Mills DS, Simpson BS. Psychotropic agents. In: Horwitz D, Mills D, Heath S, eds. *BSAVA manual of canine and feline behavioural medicine*. Gloucester, England: British Small Animal Veterinary Association, 2002;237–248.
22. Crowell-Davis SL, Landsberg G. Pharmacology and pheromone therapy. In: Horwitz D, Mills D, eds. *BSAVA manual of canine and feline behavioural medicine*. 2nd ed. Gloucester, England: British Small Animal Veterinary Association, 2009;245–258.
23. Crowell-Davis SL, Seibert LM, Sung W, et al. Use of clomipramine, alprazolam, and behavior modification for treatment of storm phobia in dogs. *J Am Vet Med Assoc* 2003;222:744–748.
24. Crowell-Davis SL, Murray T. Benzodiazepines. In: *Veterinary psychopharmacology*. Ames, Iowa: Blackwell Publishing, 2006;34–71.