

Animal Behavior Case of the Month

This feature is being sponsored by the American College of Veterinary Behaviorists. Readers of the *JAVMA* are invited to submit reports, which should include a brief description of a behavioral problem, the evaluation and treatment, and succinct discussion of the case.

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Statement of the Problem

The problem was aggression between 2 Pugs in a household.

Signalment

Both dogs were spayed. Dog 1 weighed approximately 11 kg and was 3.5 years old, and dog 2 weighed approximately 9 kg and was 1.5 years old.

History

The dogs were obtained separately from a Pug rescue group. Dog 2 was obtained first, at 3 months of age; dog 1 was adopted 3 months later, at approximately 2.5 years of age. Approximately 5 months after dog 1 was adopted, the first fight was observed. When the clients returned from vacation (their first extended separation from the dogs), dog 1 attacked dog 2 as dog 2 was being greeted. While separating the dogs, both owners were bitten.

After this incident, the clients reported that the frequency of fighting increased over the next month to 1 to 2 times/d; this frequency was maintained over the next 5 months. Fights only occurred when the clients were present, and would last from 1 to 10 minutes, depending on how difficult it was to separate the dogs. The aggressor was invariably dog 1, although over time dog 2 would growl whenever it saw dog 1 with the clients, and this growl might then provoke an attack. The clients feared potential injury to the dogs and would always intervene to stop the fights. While doing so, they had been bitten multiple times and had begun to fear for their safety.

The clients reported that the dogs were fed separately, but that they were not separated when unsupervised. The clients had observed the dogs lying together and grooming each other, with dog 2 frequently licking dog 1's ears.

Dog 1 had undergone surgical correction of an elongated soft palate, after which recovery had been uncomplicated. Bilateral luxating patellas, which the clients had been told would eventually require surgery, also had been diagnosed in dog 1. After fights, dog 1 had difficulty walking.

Physical Examination Findings

Dog 1 had a pannus-like lesion in the right eye, which was being treated by the referring veterinarian with dexamethasone sodium phosphate ophthalmic

drops, every 12 hours. This eye was visual at the examination. Dog 2 did not have physical abnormalities.

Diagnosis

The diagnoses were interdog aggression related to intrasexual hierarchic conflict and redirected aggression toward the clients. Redirected aggression is most common when an animal is interrupted in the course of an aggressive act, prior to resolution of the event.¹⁻⁴ Aggression can be redirected toward people, other animals, or inanimate objects when the primary target is inaccessible or unavailable.⁴ People bitten in the course of interrupting dog fights are usually injured because the dog bites them accidentally or because the aggression is redirected. The latter was true in this case: the individual who picked up either dog was always subjected to a frenzied attack by dog 1 that did not cease until dog 1 was isolated in another room. This behavior suggested that the aggression to the clients was not accidental.

Only dog 1 redirected the aggression. Redirected aggression can be part of a control complex involving attention-seeking behavior, possessive aggression, territorial aggression, and dominance aggression.^{5,6} Dog 1 did not exhibit signs of other associated types of aggression such as growling, lip lifting, or biting in response to requests for relinquishment of objects (behavior associated with possessive aggression), to approaches or visitation to the property from unfamiliar people (behavior associated with territorial aggression), to physical manipulation, or to verbal or physical correction by people (behavior associated with dominance aggression). Dog 1 did not redirect aggression to the clients in any correctional or command situation that did not involve separating the fighting dogs. Although compliance to verbal commands is common in dogs with many forms of aggression,¹ the only time dog 1 was not compliant to the clients' directions was when it was involved in an aggressive encounter with dog 2.

Interdog aggression is a socially, rather than sexually, mediated behavior.^{1-3,7} It is most commonly intrasexual, once a dog reaches social maturity, because canine hierarchies usually follow age ranks within a sex.^{1,8-10} In dogs, social maturity is most frequently reached between the ages of 18 and 24 months (range, 12 to 36 months).⁷ Many dogs can reach social maturity without major fights by deferring to other animals in the household or in passively soliciting and accepting deferential behavior from other animals.^{5,10}

In this case, most of the interdog aggression was passive, unless attention from the clients was involved. Further questioning revealed that as dog 2 matured, dog 1 would block dog 2's access to doorways, water dishes, and toys; dog 1 would invariably drink first, have access to furniture first, and go through the door first. These are all subtle behaviors that are part of the canine hierarchic social system. Dog 2 did not exhibit any aggression in response to these passive displays of assertion, and there were no fights in these contexts.

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However, dog 1 would not tolerate dog 2 receiving attention from the clients; in this situation, the agonistic behavior intensified from passive challenges to active aggression. The active aggression was not tolerated by dog 2. Dog 2 had never shown any signs of active deferential behavior (eg, rolling on its back for dog 1), but also had never overtly resisted a passive, subtle challenge. This behavior suggested that although dog 2 was willing to sometimes defer to dog 1, dog 2 was not uniformly submissive in its behavior. Dog 2's response changed with maturity and in response to dog 1's intensifying behavior. After experiencing repeated attacks from dog 1, dog 2 began to growl. Displays such as growling have been postulated to have evolved to decrease the probability of an aggressive event.⁹⁻¹³ Here, however, dog 1 may have interpreted the growl as an active challenge, rather than a display. The clients may have inadvertently contributed to the lack of resolution for the interdog aggression by always intervening; this may have contributed to dog 1's struggle to maintain its status.

Treatment and Follow-up

The clients were advised to use behavior modification programs designed to teach the dogs to sit, stay, and relax in response to a voice command.^{14,15} As part of a program of desensitization and counterconditioning, the clients also were asked to feed the dogs at a distance where they could see each other, but did not show aggression. Clients were to move the dishes together a few inches per day, until the dogs could ignore each other while eating side-by-side. If at any point the dogs began to react, the dishes were to be moved slightly apart until the dogs habituated to each other. Food can be an elicitor of aggression in hierarchic situations, but also can be associated with reward.¹⁵ Because the dogs were rewarded by meals only when they did not react to each other, the clients were enforcing passive desensitization and counterconditioning schedules.^{1,15} Each dog also was to receive 10 to 15 minutes of individual attention daily from each owner. Whenever both dogs were with the owners, they were to be harnessed to prevent fights.

General recommendations for treating interdog aggression usually state that the younger, healthier, larger, or more confident dog should be reinforced over the other.^{1,2,10,16} Hence, the aggressor is often reinforced first because this dog often possesses these qualities. This approach is predicated on the concept that minor aggression (involving the minimum challenge necessary to induce a deferential response, followed by acceptance of the deferential response by the aggressor without further escalation) can be a normal part of behavioral changes that are attendant with shifts in social hierarchies associated with maturity. If so, reinforcing the aggressor early in the history of the conflict may blunt future aggression by enforcing the existing deference structure. A diagnosis of interdog aggression implies that the aggression is out of context, abnormal, and not resolved through traditional social interactions.^{5,8} If the aggressor is not the younger, healthier, larger, or more confident dog, such recommendations for hierarchical reinforcement can be doomed to failure, and could encourage a dog that is responding abnormally to social cues (the aggressor) to victimize another. Accordingly, the appropriate dog to

reinforce can be difficult to identify. Experimentally reinforcing 1 dog over the other usually provides a definitive answer. In this case, the dogs were fairly close in age; the decision was made to reinforce dog 2 over dog 1, not because of the age difference, but because of physical ability. Because dog 2 fought back vigorously during the aggressive bouts and was physically healthier than was dog 1, dog 2 would probably be able to physically and behaviorally maintain the higher rank.

For any situation involving both dogs, the clients were instructed to reward dog 2 first (eg, feed first, let out first, give the first toy, invite into the bed first). The clients also were requested to separate the dogs when unsupervised; dog 1 was to be put in a less desirable room (ie, not the bedroom or places where the dog chose to spend more time), while dog 2 was to be given free range. Alternatively, both dogs were to be placed in separate, neutral rooms. This modification involved access to the physical environment and was intended to subtly and passively reinforce the status of dog 2 over that of dog 1, further altering the hierarchy. Although the clients maintained that injuries had never occurred when they were not present, separation also served to minimize risk of injury. Desensitization to the actions that precipitated the aggression would be the focus on reexamination.

A more risky alternative also was discussed with the clients: they could allow the fights to continue to completion and intervene only if injury was imminent. This strategy would determine whether one dog was able to obtain and maintain a higher status. By intervening, the clients may have inadvertently aborted the behavior that could have resolved the aggression.

A phone call to the clients 3 weeks after the appointment revealed that 2 further aggressive incidents, both of which had resulted in injury to the owner, had occurred. The clients had not worked consistently with the dogs and had not separated them when unsupervised, because they felt that the dogs would be lonely. The clients insisted that no fights had not occurred when they were not present on the basis of lack of saliva staining or injury. They felt that separation would punish both of the dogs. That the point of separation was to avoid any subtle and passive forms of agonistic behavior that might interfere with altering the hierarchy was again emphasized to the clients.

On reexamination 6 months after the initial examination, both dogs were markedly more attentive to commands and more relaxed in each other's presence. The clients had begun to implement the initial suggestion of separating the dogs. Dog 2 had been given free range of most of the house, after which all the passive behaviors designed to give dog 2 status had been easier to implement. Dog 1 now solicited dog 2 for ear-licking; when dog 2 declined, dog 1 would roll over and expose its neck and ear, at which point dog 2 would stand over dog 1 and lick its ear. During the examination, dog 2 pranced around greeting everyone, physically blocking dog 1's access. Only when dog 2 was greeted verbally and by petting, after first being requested to sit and stay, did it permit dog 1 to solicit and receive a greeting. The clients reported that they also had begun to allow the fights to continue to completion, as recommended, and had discovered that dog 1 tired more easily; dog 2 would in-

variably then pin dog 1, and no one would be hurt. Since implementing this strategy, 1 fight/wk might begin, but always resolved quickly. Dog 2 had begun to walk around dog 1, prancing on its hind limbs, after receiving deferential behavior from dog 1 at the end of an aggressive event.

Subtle cues and behaviors are important. Not until dog 1 was passively rebuffed and lowered in status by confinement and lack of interaction did the hierarchy shift. In allowing fights to continue to completion, the clients allowed dog 2 to have its status passively and actively reinforced, and dog 1's physical limits were made apparent. This strategy carries an inherent risk of escalation of aggression and potential injury to animals and people. Some dogs with interdog aggression will refuse to relinquish status or will not appropriately respond to deferential behavior, and will instead move in for the kill when any sign of weakness or submission is observed.^{4,10,17} That these dogs were more or less evenly matched and that the clients were responsible and able to respond to small changes in the dogs' behavior made this course possible. The clients had expressed a profound desire to keep both of these dogs at the initial examination. Both dogs had already been rescued once, and the clients would have been loathe to part with either dog. Had treatment not been successful, however, or should there ever be a profound relapse, either dog could be given to another, single-dog home.

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