

Swings and Round-a-bouts:

The Story of a Moody Little Man

Margaret M. Saverance

Mississippi State University College of Veterinary Medicine

Class of 2020

Clinicopathologic Conference

November 15, 2019

Advisors: Dr. C. Calder and Dr. J. Frum

Introduction

A highly social species, dogs tend to form strong social bonds with, not only other animals in a household, but with their owners^{1,2}. These strong bonds can cause some degree of anxiety in the absence of their owner for the vast majority of dogs, but there are many who appear to be more sensitive to this separation². The extreme distress in the absence, or perceived absence of the owner in these dogs is what veterinary behaviorists call separation anxiety^{2,3,4,5,6,7}. Separation anxiety is common among companion animals with anywhere from 14 to 40 percent of dogs receiving regular veterinary care receiving this diagnosis^{1,2,5,7,8}. In fact, separation anxiety is the second most common reason for presentation to referral behavior clinics^{7,9}. The number of affected animals may be higher because in many cases owners may not seek professional help if these behaviors do not inconvenience them, or if the owners are unaware of these behaviors occurring^{1,5}. In other cases, owners don't seek help because they believe these behaviors are performed out of spite and do not realize that the signs they are witnessing from their pets are signs of distress^{1,4}.

Properly diagnosing and treating this disorder can be frustrating for both the owner and veterinarian alike not only because of the negative impact on the animal's daily health and welfare, but the strain it causes on the human-animal bond^{1,2,4,5,10}. This disorder causes distress in the animal which can cause distress in the owner and, typically, by the time the owner seeks professional help, relinquishment and euthanasia are often considered viable options due to the emotional and financial cost of the problem behaviors^{1,3,4,5,6,8,9}. In this case, the owners had already attempted numerous things, such as pheromones, music/white noise machines, and treats, to try and alleviate the problem behaviors they were seeing but were seeing no resolution in signs.

History

Quincy is a 5-month-old neutered male Maltese puppy who presented to MSU-CVM Behavioral Services because he was hypersalivating whenever left alone by his owners. Quincy was acquired from a breeder at approximately 3-months-old. The owner's reported that he was the most outgoing of his litter when they went to pick him up. During the first days in his new home, Quincy began to exhibit severe signs of anxiety whenever he was left alone. Originally, his owners attempted to have Quincy sleep in his crate, but he vocalized throughout the night. Even when his primary caretaker was taking a shower, he would sit at the shower door and cry. After several days of this behavior, Quincy's owners returned him to the breeder. However, they retrieved him after two days back at the breeder's because they had already become attached to him.

In a detailed questionnaire, Quincy's owners were able to report the behaviors they were seeing whenever they returned home after any duration away. When Quincy is home alone, he defecates, urinates and salivates. He vocalizes continuously and attempts to escape by pawing and digging at the door. If he is left in his crate without access to his owners, he defecates, urinates, and salivates. If his owners take Quincy with them on errands, he becomes hypervigilant if left in the car by himself.

Prior to presentation, Quincy had passed a six-week long puppy training class at a local training company, and he was starting another six-week class. During his puppy classes, he would get distracted and urinate inappropriately despite being able to wait that length of time. He was day boarded at a local boarding facility to socialize him to other dogs and prevent him from being left alone at home. They had attempted to leave treats and toys with him as a distraction while they were away, but nothing seemed to interest him while they gone. His owners reported

that he would immediately eat any treats they had left with him after they had returned home. They increased the amount of exercise he received. They had tried white noise machines and soothing music and placing a blanket over his crate when they left. He had a stuffed animal that had a heartbeat and a heat pack inside to provide some semblance of something else being there with him. They tried larger crates and keeping him loose in the bathroom, but nothing seemed to be working. He had an electric bark collar (set to vibrate only) that appeared to help with the barking that he exhibited. They had tried Calm Chews and had purchased CBD infused treats that they hadn't tried yet at presentation. They were interested in a full assessment as to the severity the separation anxiety was. They were also interested in any treatment plans they hadn't tried yet to help Quincy with his separation anxiety. They reported that they were willing to get another dog if it would be beneficial to Quincy despite the differing opinions they had received from their trainers and primary care veterinarian.

On presentation, Quincy was bright, alert, and responsive. He weighed 2.2 kgs and had a body condition score of 5 out of 9. His heart rate and respiratory rate were 96 beats per minute and 24 breaths per minute, respectively. However, throughout the consultation, Quincy did not show the curiosity typically shown by a 5-month-old puppy. He did not want to interact with the environment or new people in the room with him. His vital parameters had to be obtained while carrying him to the scale because otherwise he would run from any attempts at interaction with student and doctor alike. He sat by his owner's feet with his ears pulled down against his head. He ignored many of the treats that were offered to him and placed on the ground close to him. Overall, Quincy showed signs consistent with fear and anxiety throughout the consultation³.

Pathophysiology

Separation anxiety is defined as extreme distress in the dog seen only in the absence or perceived absence of the owner^{2,3,4,5}. The most common signs seen in animals suffering from separation anxiety include destructiveness, inappropriate elimination (urination and defecation), and vocalization^{1,2,3,4,5,6,8,9}. Other signs include any nonspecific sign of anxiety such as panting, salivating, trembling, increased motor activity, transient anorexia, and withdrawal^{1,2,3,4,5,6,9}. However, it is important to note that these signs are only observable in the absence of the owner in cases of separation anxiety⁷. These clinical signs are associated with an extreme stress response in the animal which, chronically, can have many ill-effects on the animal's health and well-being^{2,4,10}.

The specific etiology for separation anxiety is unknown, but is believed to have a variety of predisposing environmental factors⁸. Separation anxiety typically develops in young animals, but can appear in animals of any age. Some papers indicate that there is a mild predisposition of separation anxiety in neutered males², but this is still up for debate.

It was originally suggested that canine separation anxiety was caused by an attachment that was too strong, or hyper-attachment^{1,2,4,8}. The signs associated with hyper-attachment include attention seeking behavior, increased need for physical contact, following the owner around the house, and distress when visual access to the owner was removed⁴. However, despite these signs being seen in many dogs with separation anxiety, hyper-attachment theory is not supported in the research because dogs with separation related disorders do not tend to show more affection to their owners and are not easily calmed upon reunification^{2,4,8}. Therefore, it seems that these attachments are neither too strong nor too much, merely too problematic².

A similar disorder is seen in human children and is caused by an inappropriate attachment with the caregiver, primarily the mother². Children who have separation anxiety commonly have an attachment style termed insecure-anxious^{1,2}. This insecurity arises because they are uncertain of the availability of their caregivers making them sensitive to any type of separation^{2,11}. In several studies, it has been found that dogs form attachments to their owners that are analogous to those formed between an infant and its mother^{1,2}. Similarly, an owner's care-giving style may contribute to these inappropriate attachment styles in dogs making them unable to cope with isolation or separation^{1,2,3,11}.

However, this insecurity may arise from other environmental factors. The most common risk factor for separation anxiety is acquisition from a shelter or pet shop^{1,2,4}. This connection between separation anxiety and acquisition from a shelter may explain why some studies have found a slightly higher prevalence in mixed-breed dogs. Dogs who have negative experiences early in life such as separation from the dam too early, weaning distress, or the aforementioned time in an animal shelter tend to have more signs of separation anxiety^{1,2,4}. There is a high prevalence of separation anxiety found in dogs who live in single owner households^{1,2}. Dogs with separation anxiety tend to have less daily exercise and lack adequate obedience training^{1,3,4}. Some dogs begin to show signs of separation anxiety after they have suffered a traumatic experience or a major change in family circumstances, such as a move or a new addition to the family^{2,4}.

Diagnostic Approach

Diagnosis of separation anxiety, like any other disorder starts, with a detailed history and physical examination^{1,4,5}. The history is helpful in determining the severity of the clinical signs,

as well as, whether or not the signs occur only in the absence of the owner. Most commonly a history is based on detailed owner questionnaires that help assess the frequency or severity of any observed behaviors^{1,2}. As mentioned above, an owner's characteristics will influence how they interpret and report problem behaviors and caution should be used because there is only a moderate correlation between owner-reported and empirically observed behaviors^{2,5}. Because some signs of separation anxiety such as hypervigilance, changes in body language, trembling, and signs of depression are subtle, these signs may be missed by owners^{1,2,5,9}. These more subtle behaviors make videotaping the most optimal way to truly detect separation related behaviors when left alone. Videotaping can also help determine if there is a concurrent behavioral problem, such as noise aversions or confinement anxiety, that could be contributing to the separation anxiety.

Ms. Mood provided several video recordings of Quincy when he was home alone which showed restlessness and vocalization. Other signs, that are less subtle that were seen in Quincy's case were inappropriate elimination (defecation and urination) as well as escape attempts, such as pawing and digging at doors. Hypersalivation, another commonly reported sign of separation anxiety, was often noticed by Quincy's owners when they returned home because his chin and front legs would be soaking wet.

Once a detailed history is obtained, a physical examination should be performed in order to rule out any medical causes for the behaviors being witnessed as well as assessing the patient's behavior during the consultation^{1,4}. For instance, inappropriate urination could be caused by any number of diseases that cause polyuria, such as a urinary tract infection. Inappropriate defecation could be a sign of gastrointestinal disease. The combination of inappropriate urination and defecation could be a sign of poor house-training. Salivation seen in

Quincy's case could be due to nausea and/or dental disease. Vocalization could be associated with neurologic disorders such as a portosystemic shunt, or panic due to another behavior problem such as confinement anxiety⁶.

We recommended that Quincy have a complete blood count and serum chemistry performed to rule out any underlying diseases, but also to provide baseline measurements before starting long-term medication which the owners elected to have performed with their primary care veterinarian^{1,4}. Findings from Quincy's bloodwork showed no significant clinical findings. On serum chemistry, there was a mild decrease in creatinine (0.40 mg/UL) and total bilirubin (<0.1 mg/UL). He had a mildly low total protein (5.2 g/dL), but normal albumin levels (3.5 g/dL). He had a severe decrease in lipase levels (38 U/L) and a mild hyperphosphatemia (6.3 mg/dL). A complete blood count without differentiation showed a mild leukopenia (6.7 K/uL), but upon a manual count, the only abnormality noted was a mild eosinophilia (670 cells/uL). All other cell lines showed adequate numbers.

Treatment and Management

The treatment of any behavioral disorder has three primary objectives: management, behavioral modification, and pharmacologic intervention^{4,9}. The first step is to address the anxiety underlying the behavior and reduce the manifestation of signs so that other therapies have a chance to take effect⁹. Our first step with Quincy was to avoid putting him in a situation that would cause him distress⁴. We suggested taking Quincy to doggy-daycare more often or to find a pet-sitter that he is comfortable with in order to reduce the amount of time spent alone. If there was no other choice but to leave Quincy alone, then we recommended to allow enough time between outings to allow his anxiety levels to return to baseline before leaving the house

again. Enrichment in the form of food-puzzle toys, pheromones, and music would provide Quincy with the opportunity to alleviate stress when left alone along with providing a relaxing environment. We also stressed that these toys cannot only be produced when there is imminent separation, or these toys could become a trigger for Quincy's anxiety. These tools needed to be used not only during separation, but also during phases of his behavior modification program and in his safe havens.

Quincy's behavior modification plan revolved around providing consistent and predictable interactions by rewarding calm interactions with his owners and helping him develop his own independence and coping mechanisms by conditioning relaxation on the mat⁴. Prior to presenting, Quincy had already chosen three areas in the house where he felt comfortable and could quietly relax throughout the day when his owners were home. We recommended that this quiet, independent play should be rewarded whenever noted. These areas should also be made more appealing with the addition of the aforementioned puzzle-food toys, pheromones, and music.

The final addition to Quincy's treatment plan was the addition of pharmaceuticals. The main reason to add pharmaceuticals to Quincy's plan was to help reduce his anxiety levels to increase learning potential. Drugs that enhance serotonin levels, such as FDA approved Clomicalm (clomipramine) ® and Reconcile (fluoxetine) ®, are both labeled in the treatment of separation anxiety^{4,9}. Studies have shown that dogs treated with pharmaceuticals in conjunction with their behavioral modification had greater improvement over the course of treatment and signs resolved more quickly when treated with pharmaceuticals and behavior therapy^{4,8,9}. Quincy was prescribed paroxetine at 1 mg/kg given orally daily. Paroxetine was chosen because of its moderate anticholinergic effects over fluoxetine which may help reduce his drooling in addition

to increasing serotonin levels. In addition, the MSU-CVM pharmacy did not stock Clomicalm ® nor Reconcile® at the time.

However, paroxetine, like fluoxetine, typically takes six to eight weeks to reach steady-state levels in the brain, so adjunctively Quincy was treated with trazodone at 5.5 mg/kg orally twice daily for two to three weeks. Trazodone, a serotonin agonist reuptake inhibitor, helps provided a more rapid onset of increased serotonin levels with a moderate duration of action and can be used as needed for sporadic problems. These drugs help to decrease anxiety levels without hindering the animal's memory and learning potential unlike other pharmaceuticals such as benzodiazepines¹². The side effects of these drugs typically include gastrointestinal upset and lethargy and these signs normally resolve within one to two weeks without any change in dosage^{8,9}.

Any treatment protocol for behavioral disorders should begin with sufficient client education. The primary cause of frustration among owners in the midst of behavioral treatment is miscommunication. This misunderstanding can arise due to the *language barrier* between animal and owner because the owner does not understand canine social communication. For instance, escape attempts seen in dogs with separation anxiety should not be seen as a destructive, spiteful act, but as a way the animal attempts to reunify with the owner. The increased vocalization seen in most cases is an attempt at long-distance canine communication. The destruction of the owner's property can be explained as that object having the owner's scent and providing some degree of anxiety relief in the owner's absence. The second misunderstanding arises when behavior modification techniques are not adequately explained, and therapies aimed at relieving stress are unintentionally made into further triggers for the animal's anxiety⁴. For instance, if an owner is providing special toys to a dog with separation anxiety in the hopes of providing

environmental enrichment while running errands, and these toys are only used prior to the owner leaving, the dog eventually associates that special toy with the owner leaving. This association provides an earlier trigger to the animal's anxiety. This conditioning is something veterinarians can avoid by explaining the need to use these toys during conditioning exercises when there is no indication of the owner leaving.

Case Outcome:

Since starting treatment, Quincy has showed marked improvement in overall signs of anxiety. He is maintained on his paroxetine with trazodone administered if he is left home for long periods of time or is left alone at odd times during the day. Using video recording, he has been noted to be lying down and no longer attempts to escape from his enclosure. He has also shown less vocalization and reduced salivation while his owners are away during the day as shown in video-recordings shared by Quincy's owners. He has even started running to his enclosure to in the hopes of getting cheese. He has several new toys that he enjoys while his owners are out of house; his particular favorite is his snuffle mat in which he can find a myriad of treats. He is working on relaxation techniques and leash walking skills with a local CPDT-KA certified dog trainer, and appears to be doing very well with his relaxation protocol. He spends more time at doggy daycare when his owners are going to be away from the home.

References

1. **Van Rooy, D., Thomson, P., McGreevy, P., & Wade, C.** Risk factors of separation-related behaviours in Australian retrievers. *Applied Animal Behavior Science*. 2018, Vol. 209.
2. **Konok, V., Marx, A. & Faragó, T.** Attachment styles in dogs and their relationship with separation-related disorder -- A questionnaire-based clustering. *Applied Animal Behavior Science*. 2019, Vol. 213.
3. **González-Ramírez, M. T., Vanegas-Farfano, M., & Landero-Hernández, R.** Differences in stress and happiness between owners who perceive their dogs as well behaved or poorly behaved when they are alone. *Journal of Veterinary Behavior*. 2018, Vol. 28, pp. 1-5.
4. **Sherman, B. & Mills, D.** Canine Anxieties and Phobias: An Update on Separation Anxiety and Noise Aversions. *Veterinary Clinics of North America: Small Animal*. 2008, Vol. 38.
5. **Van Rooy, D., Arnott, E. Thomson, P., McGreevy, P., Wade, C.** Using an owner-based questionnaire to phenotype dogs with separation-related distress: Do owners know what their dogs are doing when they are absent? *Journal of Veterinary Behavior*. 2018, Vol. 23.
6. **Stelow, E.** Diagnosing Behavior Problems: A Guide for Practitioners. *Veterinary Clinics of North America: Small Animal*. 2018, Vol. 48.
7. **Takeuchi, Y., Houpt, K., Scarlett, J.** Evaluation of treatments for separation anxiety in dogs. *Journal of American Veterinary Medical Association*. 2000, Vol. 217, 3.
8. **King, J.N., Simpson, B.S., Overall, K.L., Appleby, D., Pageat, P., Ross, C., Chaurand, J.P., Heath, S., Beata, C., Weiss, A.B. and Muller, G.** Treatment of separation anxiety in dogs with clomipramine: results from a prospective, randomized, double-blind, placebo-controlled, parallel-group, multicenter clinical trial. *Applied Animal Behavior Science*. 2000, Vol. 67.
9. **Simpson B., Landsberg, G., Reisner, I., Ciribassi, J., Horwitz, D., Houpt, K., Kroll, T., Luescher, A., Moffat, K., Douglass, G., Robertson-Plouch, C., Veenhuizen, M., Zimmermann, A., Clark, T.,.** Effects of Reconcile (fluoxetine) chewable tablets plus behavioral management for canine separation anxiety. *Veterinary Therapeutics*. 2007, Vol. 8, 1.
10. **Mills, D., Karagiannis, C., & Zulch, H.** Stress -- Its effects on health and behavior: A guide for practitioners. *Veterinary Clinics of North America: Small Animal*. 2014, Vol. 44.
11. **Kovács, K., Virányi, Z., Kis, A., Turcsán, B., Hudecz, Á., Marmota, M. T., Koller, D., Rónai, Z., Gácsi, M., & Topái, J.** Dog-owner attachment is associated with oxytocin receptor gene polymorphisms in both parties: A comparative study on Austrian and Hungarian border collies. *Frontiers in Psychology*. 2018, Vol. 9.
12. **Gruen, M., Sherman, B.** Use of trazodone as an adjunctive agent in the treatment of canine anxiety disorders: 56 cases. *Journal of the American Veterinary Medical Association*. 2008, Vol. 233, 12.