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Diagnosis and Treatment of Aggression in Dogs and Cats (23-Dec-2001)

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Introduction

Before speaking about diagnosis and treatment of aggression, we must think about an important question: Is aggression an abnormal behavior?

Dogs and cats are predators; both need agonistic behavior, such aggression or flight, to deal with their partners, social ones for dogs and territorial ones for cats. So, aggression or aggressive actions are normal patterns of the ethogram (i.e., the sum of all observable behaviors exhibited by a species in a definite environment) of dogs and cats. Renowned authors in this field [1-3] clearly recognize the role of agonistic behaviors in normal social communication for dogs or territorial communication for cats.

Anyway, normal or non-normal, aggressive behaviors are very often the main complaint of the owners and the reason to consult a behaviorist. The veterinary surgeon might have a central role in the evaluation of aggressive responses because we are the only ones who can make the synthesis between behavior and organic reasons. And we are the only ones too, allowed to use drugs to control behaviors. Moreover, we are used to a medical approach to disorders and we know that owners are always mainly looking for a prognosis and a clear answer to the obvious question: Is that dog or that cat dangerous?

We always follow the same pattern, to make a diagnosis, a prognosis and a treatment. But, first it seems important to explain the way we work.

Mainly there are two ways to consider behavior disorders:

- The first one is to think that animals have only normal behaviors, but can exhibit inappropriate actions because of their conditions of life. Thus, changing the environment or the rules should be sufficient to improve the behavior. And only genetics can explain real idiopathic troubles, in the absence of bad conditions.
- The other one is to use a medical model mixing a neurophysiological and an ethological point of view. This model uses common patterns for dogs, cats or any species classifying the evolution in pathological processes that lead to pathological states. If the etiology can be identified, we can describe precise characteristics that will form a nosography. The way to approach a behavior disorder will pass by the semiology (i.e., the collection of all symptoms) and the description of all the essential behaviors, even if they are not a problem for the owners. Thus, it is necessary for the practitioner to know the specific ethogram of that species to pick out the variations and their abnormal compounds.

- The pathological processes are the classical ones described in psychopathology: generalization, sensitization, pathological inhibition, involution.
- The pathological states are the phobic state, the anxious state, the depressive state and the dysthymic state.
- Because many experiments have shown in different species what kind of neurotransmitters are involved in such processes or states, we can use drugs in an appropriate way according to the model and the former results. Obviously, the map is not the territory and the model is not the reality, however, this way of modeling is useful in simplifying a reality too complex to be totally known. The important point is the ability to predict the result of the treatment by pointing out the underlying neurotransmitters disorders.
- We know that other mechanisms do exist, as gene repression or expression, but since we cannot change this point by actual treatments, we have must keep it in mind for future research.
- No drug treatment, except in rare cases, will cure, *per se*, behavior disorders and it is really important to implement behavior modifications which will make the dog or the cat fit better with its environment or its partners.
- The behavior sequences are very important to study and verify if they are all present or not. For example, a normal sequence of aggression will always exhibit a warning phase (growling or exhibiting teeth) a consummatory phase (biting) and a stop signal (appeasing signal as licking the wound after biting). This is true for each kind of behavior and this allows us to spot the pathological level. The more the sequence loses its integrity, the worse is the prognosis.

After clarifying this, we can now explain how we deal with aggression. The chapter is organized into the following sections:

- A. Description of Aggressive Sequences, including predatory, irritation, territorial and maternal, fear, hierarchical and learned aggressions.
- B. Nosography of Aggression in Dogs, including the diagnoses and prognoses for primary and secondary dyssocialisation; hyperactivity-hypersensitivity syndrome; deprivation syndrome and social phobias; and, sociopathies.
- C. Nosography of Aggression in Cats, including the similarities to dogs, dyssocialization, HsHa, deprivation syndrome, differences from dogs, intraspecific aggression, and food related aggressions.
- D. Treatments, including behavior modifications and a sample case, the use of drugs, and new ways of treatment.

A. Description of Aggressive Sequences

For us, aggression alone does not mean anything and we need to verify the sequence to identify what kind of aggression the dog is exhibiting. All symptoms put together lead to a precise diagnosis, at least a functional diagnosis. So, we have to know the different sequences of aggression. We use the classical Moyer's classification, selecting only the most useful categories in clinical veterinary ethology.

1. Predatory Aggression

This kind of aggression is controversial. Nobody can say that there is a real agonistic behavior when a dog is hunting a cat, a cat is hunting a mouse, or a man is eating a steak. Anyway, the wounds provoked by predatory aggression are severe and the veterinarian has to know how to recognize this kind of aggression. Furthermore because we will see that the prognosis is very poor and that no treatment is really effective in such a case.

Predatory Aggression in Dogs - We can see two different types of sequences, according to the format of the prey.

Big Prey -

This kind of sequence is only possible when many dogs attack together. Dogs are running beside the prey taking turns biting and tearing off pieces of muscle. When the prey has fallen, the dogs will pull the members out and will eat some parts of the abdomen and the skull.

These are, fortunately, very rare cases against human beings but sometimes veterinarians can be involved in forensic medicine and have to give their opinion.

Small Preys -

This is of greater importance in daily practice. Before attacking a small prey, dogs hop on their forelegs, point their ears toward the prey and then jump right on the neck to stop the prey. Then they bite at the same place and shake the prey. Often a cervical fracture will result leading to the death of the prey and its consumption by the dog.

Often, owners will describe their dog exhibiting this behavior in front of their newborn baby. This is a high risk situation. It means that this dog has not socialized with infants and considers them a prey. No treatment is available at this time to treat this kind of disorder. Predatory aggression is a normal sequence, belonging to the ethogram of the dog. It can do that only against species he has not socialized with. The lack of effective treatment, the real and daily danger must lead the veterinarian to recommend not keeping the dog.

Predatory Aggression in Cats - There is only one classical scheme as cats only hunt small preys and work alone. The cat compacts its body, he is trembling a little looking straight to the prey or the place where the prey could be. Then, it is going to jump and catch the small animal by the neck and begins "playing" with it. The cat can let the prey free, just between his two forelegs and will catch it again if it tries to escape. Looking at this, people find cats cruel and just forget that prey and predators are just complementary and do to each other what they are made for.

In clinics, people will describe this kind of sequence directed to the owner's feet and hands.

2. Irritation Aggression

This is a very frequent kind of aggression. Because there are two types of sequences according to the hierarchical status, the precision of the description will allow us to have a first idea of what is going on in this family-pack. Many reasons can provoke a sequence of irritation aggression. Hunger, thirst, pain, any kind of frustration but also fear can be the motives. We have to make the difference, from an ethological point of view, between an irritation aggression because the animal is frightened and a fear aggression which does need an environment with no escape route to be expressed. The sequences of

irritation aggression and fear aggression are very different and do not involve the same underlying neurotransmitter processes.

The ventro-medial hypothalamus is involved in the regulation of irritation aggression.

Irritation Aggression Sequence Exhibited by a Submissive Dog -

In these different conditions, a submissive dog will try to avoid looking directly (it turns its head to the side). Often, the dog is trembling and always exhibiting mydriasis. If he cannot interrupt the contact he will bite repeatedly, wounding people drawing blood. Just after the bite, the dog escapes and crawls on the floor.

Irritation Aggression Sequence Exhibited by a Dominant Dog -

In a dominant dog, the warning phase is very poor. The dog can growl but in a very low tone. People cannot hear it. The dog is really rigid, like a stone. If the contact does not stop, the dog will bite, often only once, and will provoke a deep and severe wound.

Just after the bite, the dog stays at the same place and can growl again.

So, we can see how important it is to ask people as precisely as possible how did the scene occur.

These bites are very often involved in aggressions against children who can maintain a contact against the will of the animal. And even if children know how to manage a dog exhibiting a real menace, too often they do not realize the danger in front of a dog showing the warning phase of an irritation aggression. It is of major importance to identify this kind of aggression for the diagnosis and the prognosis of troubles involving aggressive responses.

Irritation Aggression in Cats -

Cats also have a very precise and spectacular irritation aggression sequence. By the way, as they are mainly territorial animals, we cannot describe two different sequences according to the hierarchical status.

The most important notion in cats is the "aggression field". In a normal cat, the aggression field is "internal" and smaller than the body. So the contact does not provoke any aggressive reaction. But within seconds, and according to many factors such as the emotional status, pain, frustration, but also external signals such as humidity, light, temperature, the aggression field can increase. First, it will fit the contours of the cat. At this time any contact can lead to an aggressive response This is frequent in the consulting room when a veterinarian begins the examination and just leaves the cat alone on the table during a few seconds - to take the stethoscope for example - and will not succeed in touching the animal again.

In the last phase, the aggression field is very big and surrounds the animal many meters around. Anybody, human being or animal, crossing this field, might be attacked, even if he does not try to establish contact.

3. Territorial and Maternal Aggression

These kinds of aggression are studied together because the sequences are very similar.

Territorial and Maternal Aggression in Dogs -

The animal will warn the intruder, scratching the floor, exhibiting urine marking. Then, he will run toward the "enemy", will bite him on the back and accompany him to the edge of the territory. When the intruder is beyond the boundaries, the dog comes back inside his territory and can urinate and scratch the floor to enhance the signal.

Territorial and Maternal Aggression in Cats -

The sequence is quite similar but the cat will be hissing and spitting and then will fall down on its side, in a defensive - aggressive attitude. It can spray some urine drops on the intruder and when the intruder flees, the cat will run after and scratch his back.

4. Fear Aggression

This is another - very controversial - type of aggression. Many times people are confounding an aggressive sequence exhibited by a frightened animal, that is irritation aggression and the real fear aggression, which means an aggression when there is no possibility to escape. It is really interesting, from an ethological but also clinical point of view to differentiate between fright and fear.

During fear aggression sequences, they are always autonomous reactions such as sweating, urination, defecation, panting, trembling, mydriasis and so on. Thus it is quite easy to be sure that we are observing or we are speaking about a real fear aggression.

The so-called "critical reaction" by Heidiger (1942) is of the same nature. When an animal has no escape route, to cross the virtual line called "critical distance" by Heidiger, will trigger a sudden attack combining elements of fear, autonomous

reactions and very violent sequences of aggressiveness.

The bites will be without control, there is no warning phase but an explosion of violence and the induced wounds are severe with loss of tissue.

This sequence does exist in dogs and cats involving always simultaneous autonomous reactions with the agonistic behavior involving teeth in dogs, teeth and claws of the four legs in cats. This results in very dangerous wounds.

5. Hierarchical Aggression

This is the most common and described sequence in dogs and it does not exist in cats.

During the warning sequence, the dog shows its teeth. It is in myosis, ears pointed forward (in case of erected ears) or largely exposed (ears down). The dog growls until the conflict is over. The tail (when there is one) is up and the hair is erected. The animal walks toward the opponent in a rigid way.

If the conflict does not stop, the dog will bite in a controlled way. Dogs are said to "pinch". They do not often hurt the owners enough to cause bleeding. The owners often may consider these not to be real bites because the bites are sources of little pain and no blood.

After the attack, the dog will exhibit the appeasing sequence, the stop signal. He can lick the place he has just bitten or put his paw on the owner's thigh. At that time, there is often confusion in people's mind. They think that their dog is begging pardon. But from an ethological point of view, if they accept the last sequence, (the dog licking the wound), they do accept his dominance and this is a very classical misinterpretation.

These sequences take place when a dog defends a place, or tries to keep food for itself, anytime when there is a will to control an access to resources.

It is important not to confuse the classical "dominance aggression" and hierarchical aggression. Dominance aggression can be evoked in many types of previously described aggressions, such as fear aggression or irritation aggression and is more defined by the target (the owners) than by the sequence.

6. Instrumentalized Aggression

This can apply to all previously described kinds of aggression. This is a stage of evolution in the aggressiveness and a strong element of the (poor) prognosis. We can speak of an instrumentalized aggression when the sequence loses its structure. The warning phase and the stop signal can disappear and the dog will keep only the bite, what is called the consummatory phase. Thus, the danger increases because people have no time to react before the attack. This evolution always means that this is a long story and that the case has already worsened.

B. Nosography of Aggression in Dogs

One important point for the veterinary behaviorist is to really define the danger in order to decide whether or not he (or she) is going to treat. To recognize sequences help a lot but does not allow the practitioner to establish a diagnosis and a prognosis. Gathering information about all the symptoms, all the different aggressive sequences but also all data about the daily life of the dog or the cat will help to reach a diagnosis according to our nosography. To recognize a particular problem and its stage, provides the prognosis and makes it easier to decide whether to treat or not such animals [3].

1. Predatory Aggressions

As we described, predatory aggressions on human beings are very dangerous. When we can recognize that kind of sequence, we know three things:

- We are in front of a "normal" dog but one that has very poorly socialized with the human species because it is known that predatory aggression is possible only against non-socialized species.
- We cannot change this kind of behavior, thus this is very poor prognosis.
- The level of danger is the highest we can face in our practice.

Our duty, many times, will be so to prescribe euthanasia.

2. Primary Dyssocialisation

These dogs are really difficult to manage. They do not accept to be controlled and any trial to put them in a hierarchical frame can elicit an aggressive response.

They do not know the elementary rules of communication: they cannot exhibit a submission posture and even more, they do not recognize it. They will bite to draw blood, even a dog lying down trying to avoid the attack, and if they are in front of a stronger dog, as they cannot express their submission, they will be hurt. Fights are very violent and always lead to wounds.

One can imagine how dangerous such a dog can be when it is going to direct its aggressiveness against people. Owners can tell for instance that the dogs will put their paws on a chair and can steal the meat in the plate. If people try to take the food back, they will be bitten very strongly. So, many times people will take their hands away and will let the dog do what he wants.

These severe communication disorders take their roots in the early development of the dog (the second month). Most of the sequences are irritation or hierarchical aggression sequences.

To have a precise and positive diagnosis, we need to find such a clinical frame with lack of bite control and misunderstanding of communication rules in a, at least, three months old puppy.

3. Secondary Dyssocialisation

Since a year, a new syndrome has been described regarding dogs with an arousal of the aggressiveness after the pubescent period.

According to the clinical history of these dogs, they have quite a good development and they were able to interact in a friendly or at least in a neutral way with people and other dogs.

But around puberty, increased vigilance was noted, loss of tolerance and very quick instrumentalization in aggressive response to any kind of contact with unknown people or animals. The dog becomes very dangerous as he will not warn and will directly bite.

The owner's reaction exacerbates the problem by preventing the dog from interacting freely with other social partners.

4. Hyperactivity-Hypersensitivity Syndrome (HsHa Syndrome)

This is one of the most frequent afflictions of the young animal. The roots of the problem begin during the development of the sensorial filter, during the selective stabilization period. If puppies or kittens are not regulated enough by their mother or an adult in the group, they can exhibit lack of bite control, activity without stop signal.

These dogs, most often, are not aggressive dogs but because they lack control of their mouths, they can hurt their owners.

The main claim will be about the roughness of these dogs. They hurt people when playing and after a while, they scare owners. When we try to recognize the sequence of aggression, we cannot find anything consistent but only totally out of control play sequences. The dog can play and jump and catch a piece of the owner's shirt or trousers and tear it and if there is a piece of human skin with it, it does not mind. So people say: "That dog bites me and hurts me, I am afraid of it. I cannot understand when it is playing or not".

This is not at all a hierarchical problem, this is not dominance aggression even if there is an owner directed "aggression". But after some time, it can lead to hierarchical disorders because the dog can see it is frightening the human beings.

This is not real aggression, but there is a real danger and more than 25% of these cases can worsen and go to a secondary hyperaggressiveness.

The diagnosis recognizes two stages:

- HsHa stage 1 rarely involves aggressiveness. There is only lack or delay in bite control and inability in stopping spontaneously any behavior sequence.
- Stage 2 is linked with hyperphagia and insomnia (less than 8 hours a day). And quite often with brutality and aggressiveness.

5. Deprivation Syndrome - Social Phobias

It is the other very frequent problem initiated in the prime childhood of dogs. If there is a big difference between the natal environment and the permanent home, if there is a huge difference between the amount of positive contact with different human types during the first three months and the level of human stimulation after the adoption, we can recognize a deprivation syndrome.

Everything frightens these dogs, they keep their tails down between their legs, have their ears back and they jump at the first little noise. People describe how difficult it can be to try to walk down a noisy street with such an animal.

When they are only scared, it is difficult to cure them but there is great hope for considerable improvement. Unfortunately, many times there is, in addition to the fear, a large amount of aggressiveness against unknown persons, anybody trying to touch them. They are not well socialized and every contact is difficult for them. To avoid this situation dogs can bark, growl and snap.

In this case we can mainly recognize two kinds of aggression sequences: irritation aggression and fear aggression, depending on an opened or closed context. There are no hierarchical aggressions. We have to keep in mind that irritation aggressions and particularly fear aggressions lead to uncontrolled bites, almost always with severe wounds.

People in the street, children willing to play with unknown dogs, are the favorite targets of these animals that cannot stand to be touched.

6. Sociopathy

A sociopathy is a pathology of the group involving bad communication within the family-pack with a lack of clear rules. At the beginning, dogs exhibit anxiety and can begin to growl, to defend some places, some objects. Access to resources becomes something important.

There are many differences between "Sociopathy" and "Dominance aggression". Aggressive sequences in Sociopathy are not always present. Many cases will only show anxious signs because of an unclear communication. But the common root is an ambiguous hierarchical frame with an irrelevant communication.

To make a positive diagnosis of sociopathy we need, as an obligatory point:

- presence of at least one dominance prerogative i.e., to be fed first, to choose the resting place, to initiate most of contacts and to exhibit public sexuality.

And the presence at least of two points of the following list:

- trio of aggressions (territorial, irritative, hierarchy)
- hierarchical mounting on people of the same sex
- increased intake of food in the presence of people
- hierarchical micturations (marking)
- appropriation of human babies and aggression when the mother tries to take them
- aggression against family children
- destruction of furniture near the places where the dog can see people leaving home
- pseudo pregnancy with little amount of milk and aggression when people come close to the replacement object.

There have been discussions about the value of the meaning, for instance, of the place chosen by the dog to rest. Some authors, after a rather significant statistical study, believe that they can prove that there is no more aggressiveness in dogs resting in the bedroom than in dogs excluded from this room.

This is a difficult notion but we have to refer to certain knowledge in physical studies to understand how a signal can have no meaning in one situation and can be highly significant in another kind of environment. In systems far from the balance, it is known that minor elements can be prevalent and influence the final result. One of the simplest examples is a Cadot cell, in convection mechanism. When you heat a system compounded by two plaques, at the first level, there is a temperature gradient between the two plaques. Then, when the temperature reaches a threshold, the convection will be installed and we'll see dextrogyre and levogyre cells. Gravity influences the way the molecules react in this new balance. Gravity was present before but was not an important element when the system was near to equilibrium. It becomes a main factor when the system is far from equilibrium.

In the same way, the place chosen by the dog can have no predicting value of aggressiveness in a very balanced family-pack but it can be one very important factor and one of the targets of the therapy in case of hierarchical disorders.

Sociopathies are split between two stages:

- Stage 1 or the so-called reactional sociopathy can be diagnosed when aggressive sequences keep their integrity, above all with a correct warning phase.
- Stage 2 or the so-called instrumentalized sociopathy is diagnosed when the warning phases and stop signal have disappeared. So, the aggressive sequence is limited to the bite and this increases the danger very much.

The two stages do not recognize the same prognosis and do not lead to the same chemical treatment. In the first one, drugs are used to decrease anxiety and to help dogs in learning a new communication. In the second one, the drug is necessary to decrease the danger and to enhance control over the dog.

7. Anxieties

This is not a single affection but a pathological stage.

In the three anxious stages described by Pageat, dogs exhibit aggressiveness only during intermittent anxiety. Irritative and fear aggressions can be seen in that case. So deritualization anxiety (when dogs have to change of group and so have to learn new communication rituals - moving, shelters, after owner's death, etc.), deprivation anxiety with social phobia, even separation anxiety (very rarely) can have aggression of these kinds in their symptoms.

8. Dysthymias

In some lines of certain breeds, we find dysthymias, which are very close to the human bipolar disorders. In dogs we see unipolar (swing between normal and productive episodes) and bipolar disorders (swing between depressive, normal and productive or maniac episodes).

During the productive phases, dogs eat more and sleep less. And they show sudden aggression without reason. People are very frightened by their dog coming close, growling and suddenly snapping or biting them. Frequently accompanying mydriasis give a strange "green and mad" look described by the owners.

Many dogs begin the productive phase by appropriating a toy or an object, looking at it in a very focused manner and attacking if somebody tries to take the object away. Irritation aggressions are identified and one key-point of the diagnosis is the violence of the first attacks. This is very different in sociopathy with dogs only pinching at the beginning. People are fearful and they are right to be. Treatment involves life-long use of mood regulators and euthanasia must be considered.

9. Hyperaggressiveness of Aged Dogs

This is a very dangerous affection involving maybe senile degeneration with β -amyloids depositions in the rhinencephalic part of the brain, tumors and endocrine modifications.

The aggression sequence is modified and the dog bites before growling. So, there is a high level of risk for people.

Neuroleptics worsen the cases and only mild improvements can be hoped for using serotonergic molecules. With aging dogs and such a poor prognosis, euthanasia will often be the right approach.

There is no prevalence of sex or breed.

This is very different from cognitive dysfunction (what we could call confusional syndrom in Pageat's nosography) in which there is almost never an aggressive sequence exhibited and mild result with some drugs allowing people to keep their dog up to the "normal" end of its life.

C. Nosography of Aggression in Cats

1. Similarities to Dogs

As we tried to describe it, many mechanisms are not different among the different species and so we will have many similarities in the processes of aggressiveness. Obviously expression of this aggressiveness will be different according to the normal ethology of each specie but we will find quite the same reactions of fear leading to irritative aggression in deprivation syndromes, by instance, for dogs and cats.

Dyssocialization, HsHa, Deprivation Syndrome -

In these two species, the root of the relationships with other live beings is the attachment. Quality of this primary function will trigger ability to socialize and to adapt themselves to the world and its variations.

In case of attachment disorders or inadequate environment we will observe an abnormal threshold of response in these animals. Cats without normal maternal nursing cannot control themselves and may become very dangerous animals.

Aggressiveness in hand-raised cats is often observed and has a poor prognosis because of a total lack of bite controls and respect of the owner's face.

We can see differences between cats staying with their mother after their sixth week (up to the eighth week) or kittens separated around the fifth week. The latter are not able to socialize correctly and have many chances to be fearful cats, escaping from strangers and anything new in their environment. This can be a very helpful sign that veterinarians can use in their daily practice. When people bring a kitten to the practice and ask about his ability to socialize later, it is easy to make an accurate prediction by holding the cat by the neck. If you get a relaxed, silent cat, in fetal position, eyes closed and tail under belly, clients may hope to have a cat establishing easy good relationships with different human partners. In the opposite case, with a cat in extended posture, hissing, spitting, with ears pulled back on the head, and claws protruding, you must not recommend this cat as a family animal.

This very practical and interesting thing allows us to suspect a state of lack of socialization.

We can also see hyperactive cats with a lack of self-control including the way they use their claws. If, as with dogs we have to look at the owners' hands to see if they are not bitten too much, with cats we have to look at the owner's face to find some scratches, showing the lack of inhibition by the kitten.

Cats with deprivation syndromes very often exhibit social phobias with aggressiveness. They may attack people to prevent them from getting closer.

2. Differences from Dogs

Maybe in cats, the most important thing for the veterinarian is to understand and never underestimate the link between anxiety and aggressiveness. This is true for dogs too. But for cats it is the point.

When we have movies of cats with an aggressive sequence we always see at the same time signs of anxiety (tongue licking the nose) or mydriasis, etc. The double status, prey and predator at the same time, will trigger different and very sudden actions, defensive or offensive aggressions.

Intraspecific Aggression -

Fights between cats in the household are difficult to resolve. Veterinarians are often asked about this point and they are the only ones able to provide a correct answer. In a cat world, dominated by the smells and pheromones, a cat losing his personal and group scent will not be recognized any more. And we have all seen cats being attacked by the other household cats after having stayed a while in our clinic.

When there is a conflict between cats, we observe three stages with increasing risk. First, there are only little fights. Then these battles can lead to wounds. During the third and last stage, there is a true obsession with cats fixed in one place trying to see the other one, one thinking only of attacking, the other inhibited by fear in one place (often the litter box).

To make it simple, this very common situation is called a cohabitation anxiety. People bring the animals to the clinic because of the aggressiveness and the first thing we have to do is to teach the owner how much their cats are suffering from anxiety. Quite often, it is rather easy for the veterinarian to make possible a new life between these two animals using familiarizing pheromones or psychotropic drugs when they are needed and always building a new and appeasing environment for the two cats.

Food Related Aggressions -

Natural predator, the cat is used to eating twelve times a day the amount of food corresponding to a little mouse, or a field mouse. Taking the history we will see that many, many times the attacks are just before the meal time or at least far from the previous feeding. It is a major point to check when we have to analyze a behavior disorder in cats with aggressiveness. And even if we do not find that clue, it is always a good principle to leave more food available for the aggressive cat. The food may be hidden and the cat should have to "hunt" to find it and get it.

D. Treatments

In our approach, treatments are quite often based on behavior modifications and drug therapy. We know that many veterinarians do not like to use psychotropic drugs and we think it is because of a normal apprehension of using drugs that we did not learn about in school. This must change because it is one of our prerogatives to use drugs and to help animals (and people too) with a logical, efficient and safe prescription. Speaking about aggression, how could we correctly deal with most of the cases of aggressive dogs and cats without the help of drug therapy? In a referral practice, more than 35% of the cases are "dangerous" animals. Denying the use of psychotropic drugs will lead to a dramatic increase in the number of euthanasia cases.

But, there is no interest, except in some rare real zoopsychiatric disorders, to give only a drug therapy. The main point is always to establish a new correct frame for the animal and the people.

1. Behavior Modifications

Obviously, it is always very difficult to give solutions to provide a good therapy in front of an aggressive dog or cat. Each case must be analyzed and the resources of the family must be studied. For example, after one or two severe bites, somebody in the house, the child or the father or the mother maybe has totally lost his or her confidence in the dog and the veterinarian can build the most marvelous treatment with the right drug and a clever behavior modification, however, nothing will change because of the fear, because of the thought that this dog can do it again.

It is always hard but necessary work, besides the medical and behavioral diagnosis, to make a correct diagnosis of the resources of the system. It is not worth for anybody, nor clients nor dogs, to start a treatment if there is no energy involved in succeeding.

Principles -

Even if it is difficult to describe, we can underline the obligatory points to build a good therapy to decrease aggressiveness. As we studied in the first part, the first step is to recognize the kind of aggressive sequence and, if possible, to make a diagnosis. Drugs are chosen only according to symptoms but behavior modifications are obviously linked to the diagnosis. First point, we have to decrease or inhibit the danger. We have to teach people how to manage their dog to avoid dangerous situations and we must explain how irrelevant it would be to have a physical conflict with their animal. In any kind of diagnosis, this is not a good way. If we are in front of a real zoopsychiatric affection (as dysthymia in productive phase), there is no way to prevent the aggression by modifying the communication and if it is only a bad relationship in the family-pack we know that a bite can disorganize the system and prevent us from curing a quite simple situation. So, we never prescribe a physical conflict.

We explain the roots of the aggressive sequences and how to recognize the preliminary phase and how to react at this time according to the context and the diagnosis.

Second point, in case of miscommunication, we have to build others relationships and allow a new social organization and decrease the anxiety linked to a bad communication.

Social Directed Regression as an Example -

Let us see an example: Tommy, a 3 years old Cocker Spaniel, has bitten three times, once the father, once the mother, once the daughter.

It has two prerogatives of dominance; it eats first and it disturbs the meals of the family. It obtains food when it begs. It initiates a lot of contacts.

It displays the three types of aggression:

- Hierarchical aggression (it bit the father when he tried to make him get off the armchair, it growls when it is eating and more when it gets a bone)
- Irritative aggression: it bit the daughter while she was grooming him
- Territorial aggression; it always tries to bite the mail-man. It barks and growls every time it sees somebody, or a dog, walking along the fence.

It increases the amount of food it eats when somebody is watching him

It has never exhibited an aggressive sequence without a warning phase.

We have an obvious diagnosis of reactionary sociopathy, stage 1.

Risperidone will be used to decrease danger.

Behavior modification will be the so-called Social Directed Regression (SDR).

SDR consists in taking off all prerogatives.

- The dog will have to wait after the owners' meal to get its food and can never obtain food when owners are eating
- The place for resting is chosen by the owner. It must not be strategically located and, although many people know that the bedroom is highly valued, most do not know that hallways that allow dogs to control all entries and exits are also a very highly appreciated place by the dominant or the challenger.
- Owners must take the initiative for all contacts. If the dog comes without being called, it has to be rejected. After a while, when it has really given up demanding contact, people can call him and pet him as long as they want.

This is the general frame to build the therapy. Sometimes we will use all the elements, sometime we are going to choose the most efficient, the most relevant one. We must add how to react when there is a danger or any agonistic contact such as growling, or exhibition of any dominant or challenging sequence.

In our specific case, the prescription has been:

- Refuse any contact starting from Tommy. Send him away and when it stays quiet in its basket, you can call him back. If it does not want to come, do not insist but do not accept contact five minutes later if Tommy tries... Repeat the same procedure again. If Tommy comes when it is called, you can pet him as long as you want and you must take the initiative of stopping the contact by yourself.
- Red line play: draw a red line (with a red rubber band taped to the floor for example) two meters from the table where people eat. During the meal, Tommy is not allowed to cross the line. When the meal is over, if Tommy has not crossed the line, one of the owners will give him a piece of food as a reward. If Tommy has crossed the line, it will not get any reward.
- In any case, Tommy's meal will be given one quarter of an hour after owners' meal.
- When Tommy growls at somebody or tries to bite somebody or when it is warning somebody, all people present must come and stand side by side, shoulder against shoulder in front of the dog, to look at its back and to reject him. That is a physical coalition and it should be done each time the dog exhibits an agonistic behavior.

2. Drug Therapy

To choose the right drug is always a real challenge for the veterinary behaviorist. Many ways exist to select the molecule, statistical approach according to the diagnosis or random tries. In our Latin school, we do not choose the drug according to the diagnosis but only according to the symptoms and their link to the underlying neurotransmitter system. This is an operating model and nobody believes that it is a true image of reality. But this is very efficient to choose precisely the most valuable molecule.

We are also aware that what we say is based upon Pageat's theories expressed in his book and also upon our experience with some hundreds of cases. But as we are speaking about extra-label use of human medications, it is the responsibility of each

veterinary behaviorist to decide if he (or she) should use these drugs or not.

Neuroleptics -

Sedative neuroleptics (as acepromazine) should not be used in case of aggressiveness because of two main points:

- They can increase confusion and enhance warning phases because of a disoriented dog.
- They prevent the dog from learning and so are contra-indicated when we want to settle a therapy.

We only use this kind of drugs when we want people to take the time to think their decision over: If they are going to keep the dog or not. During a couple of days, we can give sedative neuroleptics as a chemical straight-jacket. We have to underline that it is not a treatment, only a palliative way to provide a safer situation during those days.

But others neuroleptics, the so-called antiproduktive neuroleptics can be helpful in aggression treatment. Some neuroleptics are useful when many dopaminergic symptoms are present. But neuroleptics are much more complex and we know that they are also defined by their dopaminergic and serotonergic inhibition constant ratio. Best drugs to decrease hierarchical aggressiveness have a ratio $K_i \text{ Dopa} / K_i \text{ Sero}$ between 18 and 30 and as close as possible to 20.

Risperidone is a new neuroleptic, related to the butyrophenone family, 1mg/square meter, once a day is the usual dose.

Risperidone is our best choice in front of a sociopathy stage 1 when the warning phases are still complete. We must not use it when all the warning signals - growling and exhibiting teeth - disappear.

Thymoregulators -

Carbamazepine should also be an excellent choice, used alone or in association with cyproterone acetate. The action of carbamazepine is quite complex but it should be elected for its "anti-kindling" effect, which is useful in impulsive aggressiveness. So when warning phases are unclear as we can see in sociopathy stage two, or in some hyperaggressiveness in hypersensitivity-hyperactivity syndromes, we choose carbamazepine rather than a neuroleptics.

The usual dose for carbamazepine is between 15 to 20 mg/kg twice a day.

Because of a possible hepatotoxicity, it is not recommended to treat for more than three months (even if we have seen clients continuing with this treatment for years on self-prescription without any problems to the animals).

Many times, it will be our first stage treatment and after that we will go on with another drug if we need it. But carbamazepine is very safe to begin the treatment of aggression because we can predict a dramatic decrease of the aggression sequences in the first days of the chemical treatment.

Antidepressants -

Antidepressants and more precisely SSRI (selective serotonin reuptake inhibitors) are used in aggression treatment.

A high dosage of fluoxetine (4mg/kg) for example is very efficient in decreasing the level of aggression in a few days. The error is to think that the problem is over when the dog stops biting or growling after 8 or 10 days. As we underlined first, we have never seen a dog cured only by drugs alone and many times we have to warn colleagues about the danger of giving the drug without a behavior modification.

We have to know about the mechanisms, for example the down-regulation, to predict the different stages of the effect of the drug and to adapt our therapy to these results.

With a high dosage of SSRI for example, in the first ten days, it is not worth applying a therapy because of an important sedative effect, but it is the right time for changing the dog's meal time or resting place. After this period, we can begin the behavior modifications to take the initiative in making contact and to change the dog's awareness of his hierarchical place by modifying the owner's communication without increasing the danger.

Side effects are quite common with SSRI and they have to be described to be accepted by the owners. Dizziness, nausea, head shaking, dramatic decrease of food intake up to 50% (even some days of total anorexia) may occur, but if the owners has been told to expect that, they will realize that the veterinarian knows the effects of the prescription very well, the bad ones and the good ones too.

3. New Ways of Treatment

In the next years, we can hope that new, non-toxic and very relevant ways, such as synthetic analogs of dominance pheromones, will be used to control certain kind of aggressiveness. For now, we use dog appeasing pheromone synthetic analog (D.A.P) when we are in front of a mild sociopathy because of the known relationship between dominance pheromone and appeasing pheromone.

Conclusion

Because of the danger, aggression is always a real challenge. However, using both behavior modification and drug therapy, only veterinarians can provide a true solution to their clients. To achieve this, we have to study precisely all main and side effects of the drugs and we must build relevant and efficient treatments combining changes in the dog's cognition and

security given by the molecule.

Sometimes, to treat is too risky and it is our responsibility to refuse treatment when the prognosis is poor or the danger is too high. To make the right decision means looking at the case using a true medical approach, considering etiology, psychopathology and possible treatments.

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