A case of coprophagy and pica in a geriatric epileptic dog

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Abstract: A geriatric dog, treated for epilepsy since the age of 3 years, developed a marked allo-coprophagic behavior and several episodes of pica. Multifactorial causes were taken into exam in the evaluation of the behavior: patient's history, pharmacologic treatments and the consequent liver dysfunction, age related problems and underlying motivation. A protocol of behavioral modification, essentially based on a counterconditioning model, was put in place to reduce the behavior and the related health risks.

Key Words: coprophagy, pica, epilepsy, hepatic dysfunction, dog.

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Presentation

A dog, treated for idiopathic epilepsy, was evaluated for an increased coprophagic behavior and, to a lesser extent, for pica. The patient is a 12 years and 7 months, 16.6 kg, neutered female, mongrel dog.

History and presenting signs

The patient was found, on the day of her birth in a garbage bin closed in a bag with her newborn sister. It was summertime and, when the puppies arrived at the clinic they presented signs of heat stroke (T°>41°C) and hypotensive shock. After a period of intensive care, during which the two dogs had a long sequel of health problems, they were adopted by the veterinarian of the clinic. They were submitted to artificial nutrition until weaning; everyday they met two adult female dogs to allow them to develop a normal intraspecific relationship. When the puppies were 4 months old, they were involved in a training as rescue dogs.

A brother of the same litter, after some negative experiences of adoption and a period of six months spent in a shelter, was adopted by the owner of the two sisters. The male dog was affected by sensory deprivation syndrome type I, showing redirected and intraspecific aggressions, hyperactivity and lack of self-control. Although he was treated with fluoxetine and with a specific behavioral modification training program, he never had a complete remission from his behavioral problems. When he arrived in the new home, he presented house soiling for a long time. Because he repeatedly attempted to pair with the sisters, although he was neutered, the owner decided to spay also the two female dogs, when they were 3 years old.

Few months after the neutering, the patient had the first seizure and, after some episodes, she was treated with phenobarbital. In the same way, the sister had her first seizure less than 7

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months later. Both the sisters presented cluster crises with tonic-clonic convulsions, lasting 72 hours and repeated every 2-3 weeks. After the crisis, both the sisters had a post-ictal phase characterized by tremors, movement incoordination, ataxia, falling downs, lasting almost a week.

The diagnosis, made by the neurologist, was idiopathic epilepsy and the dogs, due to the ineffectiveness of monotherapy, started the protocol with the association of phenobarbital and potassium bromide but with no positive results. During this period both dogs began to show house soiling and consumption of feces and everything else accidentally found in the environment. While the patient has never shown auto-coprophagy, the sister often tried to eat her own feces during and after defecation.

The sister, when was 5 1/2 years, died during a seizure, twelve hours after a surgery to solve an intestinal intussusception, occurred after the ingestion of part of a mattress padding and of a plastic bag with some dry food for cats inside.

The activities of the three dogs during their cohabitation had a consistent pattern: long daily walks on leash, weekly excursions to the mountains and training sessions. The dogs were gradually used to the muzzle and this habit was maintained after the death of the sister.

Between 7 and 8 years of age, the patient presented three severe episodes of pica: she drank 2.5 l of red wine, 600 hg of mayonnaise sauce and a leather leash with several knots. After the ingestion of mayonnaise, she developed an acute pancreatitis. Several months were necessary to have a complete recovery of the patient from pancreatitis but since that moment the dog hasn't had seizures anymore.

The resistance of the epilepsy to the therapies led to the change of the protocol and, some time before pancreatitis, potassium bromide was substituted by Gabapentin.

During the following two years, the activities of the dogs were reduced because of the owner's disease; at the end of this period, the brother was adopted by the mother of the owner.

Now, the patient lives with the owner in a little apartment at the 4th floor of a building in a metropolitan area. In the house, there are no other animals but the dog grew up with some cats that she meets every week when she visits her brother. When she has the opportunity, she steals cat food and feces from the cat litters.

The dog is fed two main meals, at 7.00 am and 7.00 pm, composed by industrial dried food, and other two small meals during the day. She demonstrates good self-control during meal preparation but she is always very hungry and she anticipates the moment with yapping barks.

During the day, the dog often obtains several treats as a reward. She doesn't ask for food during family meals and she doesn't receive food from the table. Water consumption is normal.

The dog is regularly taken out for walks but she doesn't have a strict routine. Walks usually have a length of 3 to 12 km, divided into 4 outputs of varying duration, between half an hour and a few hours. The destinations are parks and green areas of the town and dogs-area in which the dog is free to walk and run. Intra and interspecific relationships are good and play behavior is particularly oriented to food-reward games.

Eliminations are normal and her exploratory behavior and territorial marking are adequate. She does not eat her feces. During the last year she has shown some rare episodes of inappropriate urination in strangers' houses and few episodes of incontinence, generally on beds and during the night.

The sleeping schedule is normal. She wakes up early in the morning asking for food but she sleeps all night. She sleeps with the owner in her bed during the night and on sofas in the veterinary clinic of the owner or at home daytime.

The patient is afraid of strong acoustic stimuli such as thunder, fireworks, shots, train or bus whistles. She reacts with trembling, freezing and looking for a secure place (near the owner or on the sofa if at home). She quickly returns to homeostasis, when the stimulus ends, and she has never shown any symptoms of generalization. In a new situation, she reacts by observing people, animals and the environment without showing signs of stress but avoiding any interaction.

She is afraid of the clinical examinations carried out by unknown veterinary surgeons. She does not like excessive physical contact but she tolerates it passively.

Physical and laboratory evaluation

At clinical examination, the patient presents good nutrition condition (BCS 5/9) and hydration in the standard range. Heart and respiratory rates are normal. Abdomen is palpable and not sorrowful. No episodes of vomiting and diarrhoea have been reported in the last months. There are no signs of neurological illness or visual/acoustic impairment. The dog has normal responses to acoustic and tactile stimuli, she is alert, attentive and collaborative although somewhat intimidated by manipulations. There are no algic responses to column palpation, musculoskeletal pain in other districts nor joint pain.

On the body there are some subcutaneous neoformations identified as lipomas by previous cytological examinations. On the left paw there are two benign neoformations that periodically the dog chews, inducing a secondary infection recently treated with antibiotics. If recalled, the dog stops immediately chewing the lesions and the behavior does not assume repetitive characteristics.

At the end of 2015, during a routine check-up, the patient showed increased hepatic enzymes values and, at ultrasound echographic examination, a diffuse parenchymal disomogeneity of liver and a nodular lesion emerged. No more diagnostic examinations were performed. After a year, the hepatic lesion presented a double size (1.4 cm). There were several hyperechoic focal lesions with well-defined merges and the hepatic parenchyma presented a pattern with diffuse disomogeneity probably consequence of chronic assumption of barbiturates. At the moment the dog assumes fenobarbital 65 mg bid os (3.91 mg/kg bid) and gabapentin 300 mg bid os (18 mg/kg bid). Every 3-4 months a treatment with a hepato-protector containing silymarin and MOS is performed. The values of ALT, AST, γGT, BUN, total bilirubin, albumin, fasting and postprandial bile acids were normal at the last hematologic and biochemical tests as well as all other values. Urine and feces examination did not present alterations.

Behavior evaluation

Coprophagy shown by the patient is typically allo-coprophagy: she eats faeces of other dogs/animals but she did not eat her own nor the brother's feces when they went out together for walks. The behavior is shown both in presence and in absence of the family and other dogs, at home (cat feces) and outdoor, when she is free or on the leash, regardless of the state of gastric repletion. The dog does not show particular preference for the kind of feces she consumes: consistence, volume, temperature don't make a difference. If not scolded, she consumes them without hurry, tasting them.

Pica was no longer performed at home in the last period but is shown outdoors where the patient frequently consumes chewing gums. She does not eat grass, but she eats little woods. The exploratory behavior is finalised to find if something to eat and when it is found she seems to be satisfied but further researches are not inhibited.

The main objective of the dog is to find and eat feces. She looks for them and knows the places where they are. If on the leash, she pulls it on trying to arrive to her target as soon as possible; if let free she doesn't listen to the call until all the feces or everything else found are consumed.

The owner, to contrast the dog behavior, tries to anticipate it changing way, pulling the dog away from feces or calling her during the ingestion attempts. This seems to increase the dog's frustration taking into consideration the motivation: organic reasons add up the real pleasure of

ingestion. When the behavior is interrupted, the dog memorize the place where feces are and in a second moment tries to eat them without fail.

In consideration of the age, the patient was checked for cognitive dysfunction on the basis of Landsberg's checklist that takes into account the DISHA aging signals (disorientation, interactions, sleep, house soiling, activity) (Landsberg et al., 2013). The score was 2, due to the slight increasing of fear of auditory stimuli and sporadic episodes of urinary incontinence. Even EVEC (Colangeli & Giussani, 2004) or ARCAD classification for the evaluation of the emotional/affective and cognitive age-related disorders had a normal score: 9. The dog seems to present a normal aging with a tendency to show repetitive behaviors.

Diagnosis

The time of onset of coprophagy and pica let consider a direct consequence of the epilepsy and the treatments adopted (Landsberg et al., 2013). Hyperphagia and polyphagia shown by the dog after seizures, the constant assumption of barbiturates and the never-ending sensation of hunger induced by the therapy contribute to increasing the dog motivation. In human medicine, a recent study includes epilepsy in the spectrum of psychiatric and neurological disorders associated to coprophagy (Josephs et al., 2016).

Acute pancreatitis was not followed by a compromission of the organ so severe as to determine a pancreatic insufficiency with consequential maldigestion and malabsorption. Furthermore, in this case, the dog could show autocoprophagy too, because of the great intake of organic elements and nutrients which had not been digested, still present in her own feces (Beaver, 2009) but this aspect is not present in our case and previous examination (TLI, fecal chymotrypsin) do not support this diagnostic hypothesis. Again, according to Beaver, coprophagy in adult dogs seems to be more common among subjects who practice little exercise or are confined into limited spaces. These features do not correspond to the case and are not comforted by subsequent studies that do not find correlation between physical activity (defective or excessive) of the dog and predisposition to coprophagy (Boze, 2010) and not even between boredom and coprophagy (Boze, 2008). This aspect is curious because environmental enrichment and improvement of the relationship with the owner are among the most effective remedies in treating the disease (Boze, 2008).

Vitamin deficiencies have also been considered as causes of coprophagy. Especially the thiamine deficiency, vitamin B1, water-soluble, thermolabile, among other symptoms, induces coprophagy (Fascetti & Delaney, 2012). However, a dog fed with industrial dry food (added with thiamine after the extrusion process) can hardly develop a vitamin B1 depletion but can be manifested in animals fed for long periods with raw fish (carp, herring) containing thiaminase (Case, 2011).

In a study based on survey compilation, 632 dog's owners answers were analysed to find a correlation between coprophagy and individual factors (sex, age, sterilization, weight, activity), environmental factors (interaction with the owner, play and physical activity, opportunity to find feces), care and nutritional factors (common disorders, vaccinations, type of feeding and frequency of meal administration) and behavior factors (presence/absence of coprophagy, owner reactions, characteristic of coprophagy,) the relationship between anxiety disorders and pica/allocrophagy was statistically significant (Boze, 2010), but causes of anxiety of coprophagic dogs are unknown.

Patient's liver dysfunction was subsequent to coprophagy. However it may justify its accentuation coming under the digestive disorders that Boze believes to have statistically significant correlation in coprophagic dogs.

It is reasonable to think that in this case coprophagy is multifactorial and that a tendency to

repetition exasperates the behavior. The owner's greater attention to the dog, probably due to the absence of her brother during walks, tends to reinforce the behavior.

Treatment

To be able to verify the efficacy of treatments a 5 minutes video in which the dog was let free in a fenced space was performed. During this time she found and ate three stools of other dogs. This will serve as a comparison to evaluate whether or not treatment is effective, as suggested in human studies conducted on psychiatric patients. (Fox & Martin, 1975).

A vitamins B complex was added to patient's diet, despite vitamins depletion is a remote hypothesis in our case. Anyway, in human medicine, depletion of riboflavin has been reported in epileptic patients treated with phenobarbital (Merck's Manual) and, in veterinary and human medicine, a lack of vitamin D3 (Gascon-Barré et al., 1986; Teagarden et al., 2014), folic acid and cyanocobalamine (Pulido Fontes et al., 2016) has been reported with a statistically significant difference in patients pharmacoresistant to classical antiepileptic drugs. Furthermore, consumption of ungulates feces has been linked to the need for group B water soluble vitamins in dogs (Lindsay, 2005; Overall, 1997).

The routine of meals was slightly changed. The small morning meal was replaced with an activation game (ball with croquettes inside) that entertains the dog for 45 minutes and a Kong with jerky meat inside was added in the afternoon. This was to reduce the feeling of hunger as much as possible and keep the dog focused on stimulating and fulfilling activities.

Desensibilization is not a reasonable target because the dog can find feces everywhere outdoors. This aspect represents a negative prognostic factor in the resolution of behavioral problem. Anyway, to reduce the exposition to stimuli, it was decided to avoid free walkings in parks or dogs areas for at least a couple of months.

Training of "leave it" command was gradually proposed using the Landsberg's method (Landsberg et al., 2013): in a first stage a treat is held in the closed hand and when the dog spontaneously stops trying to open the fist and focuses attention on the owner is rewarded and praised. Then the command "leave it" is added to the sequence. When the dog is sufficiently trained (the waiting time progressively stretches), the treat is offered on the open hand and finally the training is generalized with objects, before a little and then of increasing interest, on the ground. Every time the dog is rewarded with delicacies. When the dog is interested in outdoor feces, the owner does not recall her but maintains an adequate leash tension to avoid the consumption. When the dog spontaneously turns her attention to the owner and behaves differently (eg sitting) she is praised with a "good girl!" and immediately rewarded with a treat (Case, 2010). In the same way the dog is praised when spontaneously ignores feces outdoors and when at home she does not show interest for cat's litter. Efforts have been made to choose counterconditioning techniques that induce the least possible frustration in the dog, considering the age and motivation that push the dog to consume feces (hunger).

The use of various types of repellent (eg tabasco, pepper etc) placed on the stools or inoculated inside has not been taken into account because it is technically unenforceable and in any case of dubious efficacy. Even the administration of supplements that make stomach odor or alter feces consistency (Forbid, broken mints, monosodium glutamate, sulfur, papain, iron sulphate, fiber – broccoli, carrots) has not been taken into account because the patient does not show autocoprophagy (Landsberg et al., 2013).

The use of punitive or aversive techniques, although proposed in some texts (Lindsay, 2005), was not considered because ethically unacceptable, dangerous and counterproductive. In a study by questionnaire distribution to owners of 632 dogs, 49% of whom showed coprophagy

and 28% of them showed behavior more than once a month, emerges that the most effective treatment in coprophagy prevention is to establish a solid dog-owner relationship. Prevent access to the stools, strengthen correct behaviors, and distract the animal from stools seem to be the best treatments. While punishment (positive or negative) was ineffective in the prevention of coprophagy (Boze, 2008). In human medicine behavioral modification techniques in coprophagic subjects were found to be ineffective. Best results were obtained with pharmacological therapy (haloperidol) (Josephs et al., 2016). Especially in presence of autocoprophagy, Karen Overall also suggests pharmacological intervention in dogs that exhibit anxiety-related or compulsive behavioral disorders (Overall, 1997).

Follow up

After a month of treatment, group B vitamins integration was suspended because no significant improvements were noticed.

Alfer 5 months of training the dog spontaneously turns the head towards the owner in presence of feces outdoor or sit in front of her waiting for a reward. This behavior is not performed every time, but the consumption of feces has been reduced by about 50%.

At home the dog is increasingly reporting the presence of cats' feces sniffing the air and sucking but avoiding the temptation to go and consume them.

No new attempt to leave the dog free was performed.

Discussion and conclusions

Coprophagy is a normal behavior in puppies and bitches that try to clean the nest of their litter (Gazzano, 2013). If it persists in adult subjects, it can represent a serious problem in relationship between dog and owner and undermines their bond until it brings, in extreme cases, to take into account euthanasia. (McKeown et al., 1988). It represents a potential health risk for the dog that is not only exposed to parasitism and infectious diseases but also to poisoning. Dogs frequently assume therapies for several pathologies and their active metabolites (hormones, chemotherapeutic agents, NSAIDs, etc.) can be ingested with feces. A case of thyrotoxicosis has been reported in a dog consequent to regular intake of stools of the cohabiting dog treated for hypothyroidism (Shadwick et al., 2013) and a case of carprofen intoxication due to consumption of feces of the mate-dog in prolonged NSAID therapy (Hutchins et al., 2013).

Coprophagy often has a multifactorial etiology that touches different spheres of medicine, as in the case reported. It is therefore important to try to understand what motivation prevails in the behavioral expression in order to effect the most appropriate therapies for the specific case, combining eventually different methods and approaches (Bowen & Heath, 2005). The sooner you get into the problem, the more likely you get the resolution. The best option would be not to create the opportunity but this is unfortunately applicable only in certain circumstances and would require, in the urban environment, the collaboration of all citizenship and administration. Easier and more applicable is to avoid the consumption in private gardens or at home with adequate cleaning and control of spaces.

References

Beaver, B.V.G. (2009). Canine behavior: Insights and answers. 2nd ed. St. Louis, Mo: Saunders/Elsevier.

Bowen, J. and Heath, S. (2005). Consumptive Problems - Coprophagia. In: Behaviour problems in small animals: Practical advice for the veterinary team. Edinburgh: Elsevier Saunders, pp. 151-152.

Boze, B. A Comparison of Common Treatments for Coprophagy in Canis familiaris. JACAB 2008; 2: 22-28.
Boze, B.G.V. Correlates of Coprophagy in the Domestic Dog (Canis familiaris) as Assessed by Owner Reports. J. Appl. Comp. Anim. Behav. 2010; 4: 28-38.
Case, L.P. (2011). Canine and feline nutrition: A resource for companion animal professionals. 3rd ed. Maryland Heights, Mo: Mosby.
Case, L.P. (2010). Unruly and Disruptive Behaviors in Dogs and Cats. In: Canine and feline behavior and training: A complete guide to understanding our two best friends. Clifton Park, NY: Delmar Cengage Learning, pp. 218-219.
Colangeli, R. and Giussani, S. (2004). Visita comportamentale. In: Poletto Editore ed. Medicina comportamentale del cane e del gatto. 1st ed. p. 81.
Fascetti, A.J. and Delaney, S.J. (2012). Applied veterinary clinical nutrition. Chichester, West Sussex: John Wiley & Sons.
Foxx, R.M. and Martin, E.D. Treatment of scavenging behavior (coprophagy and pica) by overcorrection. Behav Res Ther 1975; 13: 153-162.
Gascon-Barré, M., Vallières, S. and Huet, P.M. Influence of phenobarbital on the hepatic handling of [3H] vitamin D3 in the dog. Am. J. Physiol. 1986; 251: 627-635.
Gazzano, A. (2013). Il comportamento alimentare. In: Edizioni ETS ed. Manuale di etologia del cane. p. 101.
Hutchins, R.G., Messenger, K.M. and Vaden, S.L. Suspected carprofen toxicosis caused by coprophagia in a dog. J. Am. Vet. Med. Assoc. 2013; 243: 709-711.
Josephs, K.A., Whitwell, J.L., Parisi, J.E. and Lapid, M.I. Coprophagia in neurologic disorders. J. Neurol. 2016; 263: 1008-1014.
Landsberg, G.M., Hunthausen, W.L. and Ackerman, L.J. (2013). Behavior problems of the dog and cat. Third edition. Edinburgh: Saunders/Elsvier.
Lindsay, S.R. (2005). House training, destructive behavior and appetitive problems. In: Handbook of applied dog behavior and training. 1st ed. Ames: Iowa State University Press, pp. 103-106.
McKeown, D., Luescher, A. and Machum, M. Coprophagia: Food for thought. Can. Vet. J. 1988; 29: 849-850.
Overall, K.L. (1997). Coprophagia. In: Manual of clinical behavioral medicine for dogs and cats. 1st ed. St. Louis, MO: Elsevier, pp. 382-383.
Pulido Fontes, L., Pulido Fontes, M., Quesada Jiménez, P., Muruzabal Pérez, J. and Mendioroz Iriarte, M. Comparative case-control study of homocysteine, vitamin B12, and folic acid levels in patients with epilepsy. Neurologia 2016.
Shadwick, S.R., Ridgway, M.D. and Kubier, A. Thyrotoxicosis in a dog induced by the consumption of feces from a levothyroxine-supplemented housemate. Can. Vet. J. 2013; 54: 987-989.
Teagarden, D.L., Meador, K.J. and Loring, D.W. Low vitamin D levels are common in patients with epilepsy. Epilepsy Res. 2014; 108: 1352-1356.

Un caso di coprofagia e di pica in un cane anziano ed epilettico

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Sintesi

Un cane anziano, in terapia per epilessia fin dall'età di 3 anni, sviluppò un marcato comportamento di allocoprofagia e alcuni episodi di pica.

Per valutare il comportamento, sono state prese in considerazione le cause multifattoriali: storia del paziente, trattamenti farmacologici e conseguente disfunzione epatica, problemi correlati con l'età e la motivazione sottostante.

È stato messo in pratica un protocollo di modificazione comportamentale, basato essenzialmente su un modello di contro-condizionamento, per ridurre i comportamenti indesiderati e i rischi correlati alla salute.