Journal of Veterinary and Animal Sciences pISSN 2550-1283; eISSN:2622-0571
DOI: https://doi.org/10.24843/JVAS.2023.v06.i01.p01 February 2023 Vol. 6 No.1: 1-14

Case Report : Pomerinary Mix Dog Poisoning Ten Months Old Due to Rat Poison

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Abstract. A dog with a brown Pomeranian mix breed named Roni with female sex aged 10 months and weighing 8 kg, came to the Prema Vet Care clinic in Dalung on September 2, 2021 at 12 pm with complaints of hypersalivation, weakness, nausea, decreased appetite, the body feels hot, the dog is recorded to be fully vaccinated and has dewormed medicine, with maintenance around the house or not being released outside the home, and on September 3, 2021 the dog experienced vomiting after being given 4 tablets of norit tablets which work oas absorbents to absorb toxins, the first treatment was the administration of fluids infusion, injection of antibiotics and vitamins B1 and K1, it is suspected that the dog was poisoned by rat poison because the owner himself put a lot of mouse traps in the form of food mixed with rat poison (rodentox) around his house. Rodentox is a second generation rodenticide, this poison contains the active ingredient bromadiolone plus nitrite poison. Based on the anamnesis, clinical examination, and blood tests, the dog was diagnosed as having been poisoned by rat poison with a Fausta prognosis. For the first treatment, the dog was given the antibiotic betamox (0.8 ml), vitamin B1 (Neurotropic®) injection at a dose of 0.8 ml, prednisone 5 mg (40 tabs pulv.bd.d for 14 days), ciprofloxacin 500 mg (2 tabs pulv .bd.d for 7 days), and vitamin K1 (7.5 tab pulv.bd.d for 7 days) and the dog improved during 7 days of therapy and the clinical symptoms experienced had decreased.

Keywords: Mixed Pomeranian Dog; Poisoning; Poison Rat; Rodentox

I. INTRODUCTION

Dogs are one of the favorite pets that are very popular among pet lovers, almost every pet lover has a pet dog at home, because the nature of the dog itself is loyal to its owner. So that quite a lot of people keep dogs with the aim of being friends for walks or to guard homes and others. However, although many are kept as pets, not a few dog owners do not understand how to care for a good and right dog. Sometimes because they love their dogs too much, dog owners often feed their dogs carelessly, such as chocolate and vegetables, and also some types of fruit that should not be given to pet dogs because if they are consumed it will cause poisoning to the dog.

Poisoning in dogs or other pets usuallyis unintentional and occurs in the house or its surroundings. One of the causes of poisoning is the habit of animal owners giving food or drinks they consume, without realizing it can harm their pets if eaten. Many foods and drinks for humans such as grapes (Campbell, 2007), raisins (Mazzaferro*et al.*,2004), sultana cake (Sutton*et al.*,2009), shallots (Yamato*et al.*,2005) and garlic (Lee*et al.*,2000) is toxic to pets such as dogs and cats (Smit, 2011). And sometimes there are also cases of accidental animals eating poison that is installed around the house, such as rat poison which is usually distributed and installed around the area of the house that rats usually use for feeding routes.

In this case, the dog is suspected of having been poisoned by rat poison (Rodentox), which is a second-generation chronic rat poison that works as an anti-coagulant. Rodentox is a poison that contains the active ingredients Bromadiolone and Nitrite poison. Rodenticide poisons currently circulating in the market can be classified into two groups, namely acute poisons and chronic poisons, acute rat poisons that work quickly by damaging the nervous system and can kill mice as soon as 3 hours after consuming them. this type of poison, and usually in less than 24 hours the rat will die. In contrast, chronic rat poison or anti-coagulant works slowly by inhibiting rat blood clotting (anticoagulation) and breaking down capillary blood vessels in organs, and rats will die in the fastest time is 3 days to 10 days (Corrigan, 1997), and in this case rodentox poison contains active ingredients, namely bromadiolone and nitrite poison, and the active ingredients contained in this rat poison are rat poison that is krosis or anti-coagulant and is a second generation rat poison, from research conducted on the active ingredient Bromadiolone according to Priyambodo S, 2009 this poison resulted in death in rodents between 3-14 days, this is in accordance with the opinion of Corrigan, 1997 which states that the length of death of mice taking poisons containing bromadiolone or anti-coagulant rodenticides is 3-10 days. Nitrite is an important type of food additive (BTP), especially in the processing of processed meat products. Nitrite is widely used as a preservative in various types of processed meat, various negative effects of nitrite on health have been reported. Excess nitrite in the blood can cause oxygen deficiency due to the formation of methemoglobin, nitrite is absorbed in the blood after 3-4 hours and when it comes in contact with erythrocytes. Nitrite will oxidize Fe+2 in hemoglobin (Hb) to Fe3+ to form methaemoglobin (MetHb). MetHb content in the blood of 30-40% can cause clinical symptoms, and if the content reaches 80-90% it will cause

death in livestock (Clarke and Clarke 1976; Osweiler et al. 1976). According to Robson (2007), some animals can tolerate up to 50% MetHb without causing symptoms. However, if the MetHb content exceeds 80% it will cause death in animals.

Clinical symptoms that often appear are vomiting, tachycardia and seizures (Gwaltney-Brant, 2001; Hooser and Beasley, 1986). According to Noble*et al.*(2017), therapies that can be given to overcome these events are:*activated charcoal*, apomorphine, fluid therapy and antiemesis. However, the therapy given depends on the clinical symptoms that appear. Preventive efforts that can be done are to keep food that is toxic and provide knowledge about the dangers of giving it to dog owners. Diagnosis can be made by history taking, physical examination and laboratory if necessary such as blood tests and also blood biochemistry to determine abnormalities that occur.

Therapy in poisoning cases is only symptomatic based on clinical symptoms that appear and is supportive to reduce or eliminate clinical symptoms, because there is no specific antidote for poisoning cases.what is done is more symptomatic and supportive to eliminate clinical symptoms that appear and improve the condition of the animal's body. Therapy that can be carried out is more symptomatic and supportive depending on the clinical symptoms that appear (Thompson, 2012). However, success can be achieved with combination therapydetoxification, supportive and symptomatic care. Detoxification can be doneby giving*activated charcoal*as an absorbent to absorb toxins. While supportive therapy can be done by giving replacement fluids intravenously (IV) to reduce dehydration and catheterization to prevent reabsorption of toxins. Muscle relaxants and anticonvulsants should be given when these symptoms appear.

II. MEDICAL RECORD

Signalement

The case dog is a brown Pomeranian mixed breed named Roni with female sex aged 10 months and weighing 8 kg.

Anamnesis

Case dogs were brought to visit the the Prema Vet Care clinic Canggu on September 2, 2021 at 12 pm with complaints of weakness, decreased appetite, and the owner said via telephone on August 24, the dog experienced hypersalivation but the dog was not brought to the clinic and on September 2, 2021, was only brought to the clinic when he experienced clinical signs such as hypersalivation, weakness, nausea which resulted in decreased appetite, the dog was recorded to be fully vaccinated and had

deworming medicine, with maintenance around the house or not released into the wild, and on September 3, 2021 the dog experienced vomiting because after receiving the first treatment in the form of intravenous fluids, injection of antibiotics and vitamin B1, the dog was given 4 tablets of norit tablets to absorb the poison so that the remaining poison in the digestive tract could be removed, it is suspected that the dog was poisoned by rat poison because the owner himself put a lot of mouse traps in the form of food mixed with rat poison (rodentox) around his house.

Figure 1. Case dogs when they receive first treatment

Physical Examination

The data obtained from the physical examination of the dog, in the form of body temperature, heart rate, pulse rate, respiration rate,*capillary refill time*(CRT), skin turgor and found results as presented in Table 1.

Table 1. Data on Physical Examination Results from Dogs that have been poisoned

Variable	Results	Normal value	description
Body temperature	40.2°C	37.6 – 39.4°C	increase
Mucosa	Dry and pale	Wet and pink	Decrease
Pulse (per minute)	164 x/minute	76 – 148 times/minute	Increase
Respiration (per minute)	60 x/minute	24 – 42 times/minute	Increase
Capillary refill time(CRT)	More than 2 seconds	Less than 2 seconds	Decrease
Skin Tugor	More than 2 seconds	Less than 2 seconds	Decrease

Sources: 1 Surono et al., 2003; 2 Subronto, 2008; 3 Widodo et al., 2011; 4 Cunningham, 2002

From the data above (Table 1.) it is known that the dog has abnormalities on his physical examination, this can be a benchmark in making a diagnosis. And as

dog owners say that dog owners put rat poison mixed in food, from the history taken,and the results of the physical examination, the diagnosis leads to poisoning due to rat poison.

Supporting Investigation

Investigations carried out are blood testsComplete Blood Count (CBC) to see the normality status of the blood. And the results of the CBC blood test are as follows Table 2.

Table 2. Results of the first CBC examination on September 2, 2021.

Variable	Results	Unit	Normal reference	Note.
WBC	12.47	109/I	6.00 – 17.00	Normal
LYM	5.10+	109/I	1.00 – 4.80	Increase
MON	0.44	109/I	0.20 – 1.50	Normal
NEU	6.40	109/I	3.00 – 12.00	Normal
EOS	0.52	109/I	0.00 – 0.80	Normal
BASS	0.00	109/I		Normal
LYM%	40.9	%	0.0 – 100.0	Normal
MON%	3.6	%	0.0 – 100.0	Normal
NEU%	51.3	%	0.0 – 100.0	Normal
EOS%	4.2	%	0.0 – 100.0	Normal
BASS%	0.0	%		Normal
RBC	6.10	1012	5.50 – 8.50	Normal
HGB	11.0-	g/dl	12.0 – 18.0	Decrease
HCT	37.65	%	37.00 – 55.00	Normal
MCV	62	fi	60 – 77	Normal
MCH	18.1-	Pg	19.5 – 24.5	Decrease
MCHC	29.3-	g/dl	31.0 – 39.0	Decrease
RDWc	16.9	%	14.0 – 20.0	Normal
RDWs	38.3	fi		Normal
PLT	0	106/I	165 - 500	Decrease
MPV		fl		
PCT		%		
PDWc		%		
PDWs		fi		

Information on CBC test results: Lymphocytosis, Anemia Hypocromia, Thrombocytopenia

From the results of the CBC, the diagnosis was obtained as above, the first is lymphocytosis, a condition where the level of these lymphocytes is usually a marker of infection from viruses or bacteria, but in other conditions high lymphocytes can also be a sign of inflammation or consumption of certain substances that can cause inflammation. increased levels of lymphocytes. The diagnosis based on the results of these investigations leads to a diagnosis of poisoning because there is no increase in neutrophils, basophils, or eosinophils in case of infection, and is also

strengthened by the diagnosis leading to poisoning in the presence of anemia and thrombocytopenia.caused by second-generation rodenticides which are anti-coagulant.

Diagnosis and Prognosis

From the results of the history, physical examination, and supporting examinations, the dog in this case was diagnosed withand the dog's high body temperature when held and brought the dog to the clinic for immediate treatment so that on investigation the abnormalities that occur are not too severe and symptomatic therapy can be carried out immediately and the dog's condition can recover because it has not yet damaged the organs. The diagnosis leads to poisoning due to the occurrence of Lymphocytosis where high levels of lymphocytes are usually a marker of infection from viruses or bacteria, but in other conditions high lymphocytes can also be a sign of inflammation or consumption of certain substances that can cause increased levels of lymphocytes, is also supported with low hemoglobin and blood platelets which means anemia occurs which leads to the diagnosis of poisoning due to second generation anti-coagulant rat poison.

Treatments

Initial therapy after the dog's examination was administered by injection of the antibiotic betamox (0.8 ml), injection of vitamin B1 (Neurotropic®) at a dose of 0.8 ml,*activated charcoal*(Norit 4 tabs),prednisone 5 mg (40 tabs pulv.bd.d for 14 days), ciprofloxacin 500 mg (2 tabs pulv.bd.d for 7 days), and vitamin K1 (7.5 tabs pulv.bd.d for 7 days). and the dog was hospitalized and given supportive intravenous fluids RL in the morning the dog had improved slightly and the owner brought the dog home because the owner asked to be treated at home. On September 3, 2021, the dog vomited after giving Norit after receiving the first treatment, lack of drinking and physical examination, the results obtained that the body temperature was normal (38.7°C), skin turgor was normal (≤ 2 seconds), and the mucosa was not too bad. pale, there is no sign of subcutaneous bleeding, and palpation of the abdomen does not feel hot, and the dog is still given intravenous fluids (glucose, RL, and NaCl) to restore his anemia and by giving this intravenous fluid, it is also hoped that the poison that enters can also exit through body fluids so that clinical signs can be reduced. After ±48 hours (4 September 2021) the dog was tested again for CBC and the following results were obtained:

Table 3. Results of the second CBC examination on September 4, 2021

Variable	Results	Unit	Normal reference	Note.
WBC	29.98+	109/I	6.00 – 17.00	Increase
LYM	1.41	109/I	1.00 – 4.80	Normal
MON	2.60+	109/I	0.20 – 1.50	Increase
NEU	25.82+	109/I	3.00 – 12.00	Increase
EOS	0.12	109/I	0.00 – 0.80	Normal
BASS	0.02	109/I		Normal
LYM%	4.7	%	0.0 – 100.0	Normal
MON%	8.7	%	0.0 – 100.0	Normal
NEU%	86.1	%	0.0 – 100.0	Normal
EOS%	0.4	%	0.0 – 100.0	Normal
BASS%	0.1	%		Normal
RBC	5.75	1012	5.50 – 8.50	Normal
HGB	11.2-	g/dl	12.0 – 18.0	Decrease
HCT	35.84-	%	37.00 – 55.00	Decrease
MCV	62	fi	60 – 77	Normal
MCH	19.4	Pg	19.5 – 24.5	Normal
MCHC	31.2	g/dl	31.0 – 39.0	Normal
RDWc	17.3	%	14.0 – 20.0	Normal
RDWs	39.8	fi		Normal
PLT	141-	106/I	165 – 500	Decrease
MPV	10.3	fl	3.9 – 11.1	Normal
PCT	0.15	%		
PDWc	39.5	%		
PWDs	18.5	fi		

Information on CBC test results: Leukocytosis, Neutrophilia, Monocytosis, Thrombocytopenia

From the results above, we can see where the leukocytes in neutrophils and monocytes begin to be high, this indicates an infection in the dog's body. Neutrophilia indicates an infection due to bacteria or viruses and monocytosis indicates an infection in the body due to a virus or bacteria and there can also be inflammation so that these monocytes clean up dead cells and inflammatory cells, but dogs do not experience significant clinical symptoms and dogs are more active than dogs. Previously, this was due to the administration of an antibiotic injection (Betamox) at the beginning of the dog's arrival at the clinic and administration of Ciprofloxacin to reduce infections caused by both gram-positive and gram-negative bacteria in the intestines and inflason prednisone which is an anti-inflammatory drug to treat inflammation that occurs. so that clinical symptoms can be reduced, and the administration of inflason prednisone which also gives an increase in platelets although it is still relatively low, but is already higher than the previous CBC

results. This indicates that the therapy provided is quite effective and also the skill of the animal owner himself who brought his dog earlier when he saw his dog was weak, so that the dog received symptomatic and supportive therapy earlier and the dog's condition did not worsen. And on September 8, the dog was tested again for CBC after 7 days from the first time he was brought to the clinic. This indicates that the therapy provided is quite effective and also the skill of the animal owner himself who brought his dog earlier when he saw his dog was weak, so that the dog received symptomatic and supportive therapy earlier and the dog's condition did not worsen. And on September 8, the dog was tested again for CBC after 7 days from the first time he was brought to the clinic.

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Table 4. Results of the third CBC examination on September 8, 2021

Variable	Results	Unit	Normal reference	Note.
WBC	17.69+	109/I	6.00 – 17.00	Increase
LYM	4.46	109/I	1.00 – 4.80	Normal
MON	1.18	109/I	0.20 – 1.50	Normal
NEU	10.50	109/I	3.00 – 12.00	Normal
EOS	1.44+	109/I	0.00 – 0.80	Increase
BASS	0.11	109/I		Normal
LYM%	25.2	%	0.0 – 100.0	Normal
MON%	6.7	%	0.0 – 100.0	Normal
NEU%	59.3	%	0.0 – 100.0	Normal
EOS%	8.1	%	0.0 – 100.0	Normal
BASS%	0.7	%		
RBC	6.15	1012	5.50 – 8.50	Normal
HGB	12.0	g/dl	12.0 – 18.0	Normal
HCT	39.28	%	37.00 – 55.00	Normal
MCV	64	fi	60 – 77	Normal
MCH	19.6	Pg	19.5 – 24.5	Normal
MCHC	30.7-	g/dl	31.0 – 39.0	Decrease
RDWc	18.2	%	14.0 – 20.0	Normal
RDWs	43.0	fi		Normal
PLT	67-	106/I	165 – 500	Decrease
MPV	11.5	fl	3.9 – 11.1	
PCT	0.08	%		
PDWc	41.3	%		
PWDs	21.7	fi		

Information on CBC test results: Leukocytosis, Anemia Hypochromia, Thrombocytopenia

From the CBC results above, dget better results than before with the dog having started to be active and being active as usual, leukocytosis only increased ± 0.69 from the normal value, and the level of anemia was not high, and the dog had increased activity and clinical signs that occurred also no longer found, and clinical signs of poisoning also no longer exist. The increase in eosinophils is the body's immune response that is useful for destroying foreign substances, and regulating inflammation. On September 8th, PT (Prothrombin Time) and aPTT (Activated Partial Thromboplastin Time) examinations were also carried out to evaluate the patient's blood coagulation status to monitor liver function and the following results were obtained:

Table 5. PT/aPTT test results

Test	Results	Normal reference	description
PT	17.6 second	14 – 19 second	Normal
aPTT	88.1 second	75 – 105 second	Normal

III. DISCUSSION

Poisoning is a condition in which infectious substances or organisms, both bacteria, viruses, and parasites that can cause toxins enter the body through contaminated food or substances that are accidentally ingested so that the body experiences clinical symptoms due to disturbances in the digestive system and can eventually interfere with other systems. Clinical symptoms that can arise due to poisoning include hypersalivation, nausea, diarrhea, increased body temperature, weakness, anemia and according to (Gwaltney-Brant, 2001; Hooser and Beasley, 1986) clinical symptoms that often appear are vomiting, tachycardia, and seizures.

The situation as above should not be underestimated by the owner of the pet, immediately take it to the veterinarian so that it can be treated immediately and given further therapy for handling poisoning. Clinical symptoms that arise due to poisoning must be treated immediately so that secondary infection does not occur, and the usual therapy for this poisoning case is:According to Noble*et al.*(2017), therapies that can be given to overcome these events are:*activated charcoal*, apomorphine, fluid therapy and antiemesis.

At the beginning of the case the dog was brought to the clinic with hypersalivation, weakness, nausea and it had been reported a few days earlier that the dog had hypersalivation but was not brought to the clinic, and when the dog started to feel weak and less active then the owner took him to the clinic for examination, and from From the anamnesis data and clinical examination, it is suspected that the dog was poisoned by rat poison which was spread by the owner around his house and the paths of rats, among others, the irrigation flow from the house to the gutter, kitchen, garage, and yard near the gate. This can be seen from the clinical symptoms that arise due to poisoning, namely hypersalivation accompanied by weakness, nausea, and increased body temperature. and increased body temperature, and if hypersalivation is caused by inflammation of the mouth, then hypersalivation will usually be accompanied by the presence of blood mixed in the saliva, supported by the results of the investigations in table. 2 as a diagnosis, lymphocytosis occurs but there is no increase in leukocytosis, this condition can be a marker that there are substances that enter the body that cause clinical symptoms that appear or lead to a diagnosis of poisoning due to rat poison. Rat poison is a chemical substance that is mixed in food and distributed around homes, fields, or plantations to deal with rats that become pests at home, rice fields, or plantations. The characteristic of the rat poison used is that the poison contains an active ingredient that makes the rats thirsty and go out looking for light before the time of death. The poison will work as an antagonist of vitamin K in the blood and inhibit the blood clotting process. After eating the poison, the rat will die within a week (Dr. Ir. Wahyu Daradjat Natawigena, M.Si, 2017). According to the lecturer at the Department of Pests and Plant Diseases, Faculty of Agriculture, Padjadjaran University, the process of death that took this week was intentional. This is based on the fact that rats are intelligent animals. If the death of a rat is close to a rodenticide, other rats will be able to associate the death of their friend with the bait. nearby. And if this poison is eaten by the dog in this case.

The therapy given to the dog in this case when he first came to the clinic was by giving intravenous fluids RL, injection of the antibiotic betamox (0.8 ml), injection of vitamin B1 (Neurotropic®) with a dose of 0.8 ml,*activated charcoal*(Norit 4 tab), prednisone 5 mg (40 tab pulv.bd.d for 14 days), ciprofloxacin 500 mg (2 tab pulv.bd.d for 7 days), and vitamin K1 (7.5 tab pulv.bd. d for 7 days), fluid therapy is important to treat dehydration in dogs and it is hoped that the toxins in the blood vessels can be excreted, at the beginning of

therapy (first day) betamox antibiotics are injected IV by infusion to avoid secondary infections and overcome disorders that may occur. in blood vessels, in addition to giving by injection through infusion aims to accelerate drug absorption and facilitate therapy in emergency situations, injection of vitamin B1 aims to strengthen muscles, to overcome weakness and help build energy, administration of*activated charcoal*(Norit 4 tab) aims to absorb poison so that the remaining poison that remains in the digestive tract can be removed by vomiting as the effect of giving*activated charcoal*this. On the next day, prednisone, which is a corticosteroid drug, aims to reduce inflammation caused by toxins and increase the formation of erthroid cells in the spinal cord, as well as prolong the life span of erythrocytes and platelets. In addition, ciprofloxacin was administered to coat the gastrointestinal tract from gram-positive or gram-negative bacterial infections by inhibiting bacterial DNA replication. Ciprofloxacin administration also aims to replace the role of betamox so that the antibiotic dose can be controlled and minimize AMR (antimicrobial resistance).

Basically this therapy in addition to reducing clinical symptoms that arise, also aims to remove toxins in the body so that clinical symptoms do not appear longer and cause more severe damage, so intravenous fluid therapy is one of the right choices in handling poisoning cases. , the administration of this infusion fluid is not only to overcome dehydration, but also with the hope that toxins can also come out through the body's excretory fluids so that clinical symptoms can be reduced. Infusion fluids used in this case include RL, NaCl, and Glucose infusion fluids. The functions of these various types of infusion fluids are also different, this RL (Ringer Lactate) is a type of crystalloid fluid that is used to replace body fluids lost due to injury/injury and this fluid contains potassium, calcium, sodium, chloride, and lactate. NaCl 0 as an energy source.

This therapy runs for about 7 days until September 8, 2021 and at the time of therapy for dogs, routine blood tests are also carried out to control the progress of treatment, carried out on September 4, 2021 and on September 8, 2021 and dogsthe condition improved with the reduction of clinical signs of poisoning and the dog returned to his usual activities from the dog. And also dogs are also carried out supporting examinations in the form of PT/aPTT examinations on September 8, 2021 which aims to evaluate the coagulation status of dogs. PT examination aims to evaluate extrinsic coagulation factors, while aPTT can detect the function of intrinsic coagulation factors and Coagulation Components. Both of these

tests can help explain the cause of the abnormality of bleeding or blood clotting as well as the function of the aPTT examination as well as to monitor liver function.

IV. CONCLUSION

Based on the history, clinical examination, and supporting examinations, the dog was diagnosed with poisoning due to second generation anti-coagulant rat poison with a Fausta prognosis due to the speed and timeliness of the animal owner to detect abnormalities in the dog such as hypersalivation, weakness, nausea so that there is no appetite. eating, and the dog's high body temperature when handled and bringing the dog to the clinic so that he can get treatment immediately so that the dog's condition does not worsen and symptomatic therapy can be carried out immediately. Handling is done by giving anti-inflammatory, antibiotics to avoid secondary infection, vitamins B1 and K1, and also giving intravenous fluids (glucose, RL, and NaCl).

V. SUGGESTION

Cases of poisoning cannot be taken lightly, because if the poison eaten is strong then the dog will experience a very bad condition and result in death. If clinical symptoms occur such as hypersalivation, nausea, vomiting, anorexia, weakness, elevated body temperature, and dehydration, immediately take them to the veterinarian for early treatment so that the condition of the dog or pet will be recovered faster and the clinical symptoms experienced can be reduced.

ACKNOWLEDGMENT

The author would like to thank the Prema Vet Dalung clinic, and the case dog owners who have helped in completing this case report both morally and materially.

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