



# Animal Behavior Case of the Month

## Statement of the Problem

A cat was evaluated because of an 8-month history of inappropriate defecation on hardwood surfaces.

## Signalment

The patient was a 5 year-old 3.5-kg (7.7-lb) neutered male Persian cat.

## History

The cat had been adopted from a rescue service 8 months before the evaluation and lived with the owner in a studio apartment. The cat had defecated outside the litter box since it was adopted; according to the previous owner, the cat had no history of inappropriate elimination. The cat had signs of pain during defecation, diarrhea, and hematochezia for approximately 3 months after adoption. A physical examination and blood, fecal, and urine analyses had been performed by the primary care veterinarian 6 months prior to evaluation at our clinic. Results of those tests had indicated mildly low serum albumin concentration, high serum globulin concentration, and mild neutrophilia. The cat had negative results for FeLV and FIV tests. Other test findings were unremarkable. Differential diagnoses for the cat included maldigestion, inflammatory bowel disease, and neoplasia. Further diagnostic tests were recommended, but the owner declined. After treatment with metronidazole (10 mg/kg [4.5 mg/lb], PO, q 12 h for 4 weeks) and feeding of a hypoallergenic diet, diarrhea resolved and hematochezia was detected less frequently; however, the frequency of inappropriate defecation did not change.

Located in the bathroom of the apartment was 1 medium-sized, open litter box with unscented clumping litter, which the cat used consistently for urination and approximately once per week for defecation. The owner removed feces and urine from the litter box every other day, and the litter was changed every 2 weeks. The owner had tried various types of litter boxes and litter and had added a second litter box in a different room; these had no effect on the cat's inappropriate defecation. The cat routinely defecated on hardwood surfaces in the apartment, including on the floor in a doorway between the living room and the owner's bedroom, under the sofa, or on other hardwood surfaces (eg, bookshelves). The cat also urinated outside the litter box 3 times: once the first night after the adoption

and twice when it had severe gastrointestinal (GI) tract symptoms. Inappropriate urination was not an ongoing problem at the time of the evaluation. The cat urinated and defecated in a squatting posture and did not try to cover the urine or feces, either in the litter box or on the floor. When the owner saw the cat posturing to defecate, she picked the cat up and confined it in the bathroom, where it typically defecated in the litter box but sometimes on the floor. At the time of the evaluation, the owner reported that the cat was defecating inappropriately daily and a small amount of blood was detected in the feces approximately twice per week.

## Physical Examination Findings and Laboratory Results

During the first part of the evaluation, the cat remained in its carrier, which was open. Then, the cat voluntarily left the carrier, briefly seemed to examine the environment, and jumped onto the owner's lap, where it stayed for the remainder of the evaluation. Results of physical examination indicated the cat had palpably thickened large intestine and mild gingivitis. The cat was underweight (body condition score, 3/9). A CBC and serum biochemical analyses were performed for the cat. Urine collection was attempted, but was unsuccessful. Results of the CBC indicated macrocytic, normochromic regenerative anemia and mild neutrophilia. Results of serum biochemical analyses indicated a mildly low BUN concentration and a mildly high aspartate aminotransferase activity; these findings were not considered clinically important because values of other serum biochemical analysis variables were not consistent with liver dysfunction.<sup>1,2</sup> Mild hypercalcemia and a mildly low serum albumin-to-globulin concentration ratio were also found. Testing to measure circulating concentrations of thyroxine (ie, T<sub>4</sub>) was recommended, but the owner declined because of financial concerns.

## Diagnosis

Cats may have inappropriate elimination because of learned substrate or location preferences, aversion (eg, secondary to pain), marking, anxiety-related urination or defecation, or GI tract, urinary tract, or systemic disease.<sup>3-6</sup> Long hair may also be a risk factor for inappropriate elimination.<sup>7</sup> Because occasional inappropriate urination coincided with 2 stressful events (introduction to a new household and disease), anxiety-related urination<sup>3,4</sup> was diagnosed for the cat of this report.

The medical history suggested mild regenerative anemia in the cat was most likely attributable to blood loss via the GI tract.<sup>8,9</sup> Mild hypercalcemia, if that finding had been confirmed via detection of a high serum

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free calcium concentration, might have indicated occult neoplasia (hypercalcemia of malignancy). The mildly low serum albumin-to-globulin concentration ratio and mild neutrophilia in the cat were attributed to inflammation.<sup>10,11</sup> Further diagnostic tests, including abdominal ultrasonography, measurement of serum free calcium concentration, and serum protein electrophoresis analyses, were recommended for the cat. The owner declined because of financial concerns and because she thought that the progression of inappropriate elimination, which was her primary concern for the cat, was not attributable to the other medical problem.

A substrate preference was diagnosed for the cat because it was defecating consistently on hardwood surfaces in various locations.<sup>3-6,12</sup> The cat was consistently using a litter box for urination; however, another author reported<sup>6</sup> that cats can develop a substrate preference exclusively for defecation. Pain or discomfort secondary to acute GI tract problems may have initially caused a primary litter box aversion in the cat,<sup>5</sup> but inappropriate defecation at the time of the evaluation was thought to be attributable to a secondary learned substrate preference because that problem did not seem to improve after improvement of GI tract disease.<sup>6,12</sup> A diagnosis of persistent (at the time of the evaluation) substrate or location aversion was excluded because the owner had tried various litter substrates and litter box locations without any improvement in the cat's inappropriate defecation.<sup>6</sup> For these reasons, we determined that the behavioral problem and the medical problem could be treated independently. A diagnosis of micturating (ie, marking via defecation) was excluded because the cat was also defecating on hidden surfaces that had no obvious social importance (eg, under the sofa) and because marking is typically not associated with substrate preference.<sup>4,6,13</sup>

## **Treatment**

The owner was informed that the lack of a confirmed diagnosis and appropriate treatment of the medical problem of the cat might prevent resolution of the inappropriate defecation.<sup>3,4</sup> Treatment recommendations for the inappropriate defecation included environmental and behavioral modifications. Drug treatment was not recommended because anxiety and social conflict were not determined to be causes of inappropriate defecation.<sup>3,4</sup> The owner was instructed to avoid any form of punishment of the cat to prevent the development of anxiety- and fear-related behaviors.<sup>3-5,12,13</sup> For times during which the owner could not directly supervise the cat, temporary confinement of the cat in the bathroom was recommended to limit its access to previously soiled areas, especially at times of the day when (according to the history) it was most likely to defecate. The recommendation was also made that, after 4 weeks of appropriate litter box use, the owner could gradually allow the cat to spend an increased amount of time out of the bathroom.<sup>3,5,6,14</sup> High-value treats and playing were recommended to condition a positive association for the cat with the restricted environment.<sup>6,15,16</sup> Use of a pheromone diffuser<sup>8</sup> was also recommended to reduce confinement-related stress.<sup>17</sup> In addition to the original litter box, we instructed the

owner to place a large, flat, open litter box in the bathroom. Because of the preference of the cat for defecation on hard surfaces, the recommendation was made that a small amount of unscented clay litter be placed in the new litter box for the first week, followed by a progressively increasing amount of litter.<sup>5,6,18</sup> Another large, uncovered, flat litter box was to be placed in the living room. When the cat was allowed out of the bathroom and displayed behaviors preliminary to defecation, such as digging or posturing,<sup>6</sup> a sound (associated with a treat via classic conditioning methods) was to be used to divert the cat's attention. The cat was also trained to a consistent verbal cue via positive reinforcement so that the owner could direct the cat to a litter box.<sup>15</sup> Previously soiled areas were to be cleaned with an enzymatic cleaner. Daily removal of urine and feces from litter boxes and complete changes of litter every 2 weeks were recommended.<sup>3,12,13</sup>

## **Follow-up**

One week after the evaluation, the owner reported that the cat was typically confined in the bathroom when it was unsupervised, so that only 2 episodes of inappropriate defecation had occurred since that time. Another litter box had been added in the bathroom, which the cat used for defecation, but a litter box had not been added in the living room. The cat had a short period of diarrhea after a change in brand of hypoallergenic food. Four weeks after the evaluation, the owner reported that inappropriate defecation of the cat had improved. The cat was frequently kept in the bathroom when unsupervised, and it had used the litter boxes often. The owner did not observe blood in the feces, and diarrhea had resolved. However, the owner was unsure whether the cat had gained weight. We informed the owner that the absence of visibly detectable amounts of blood in the feces did not exclude ongoing occult bleeding and that potential improvement of the anemia should be verified via performance of laboratory tests.<sup>8,9</sup> We also reminded the owner that adding a third litter box out of the confinement area might lead to further improvements in behavior of the cat. The owner informed us that she was moving to a larger apartment in 14 days. At 6 weeks after the evaluation (2 days before moving to the new apartment), the cat was rarely being confined to the bathroom, and it used the litter boxes for defecation approximately 80% of the time. We advised the owner that the upcoming move might cause anxiety for the cat and worsen the inappropriate elimination, so we recommended that the cat be kept in a restricted area for 4 weeks after the move.

Eight weeks after the evaluation, the owner and the cat had been living in the new apartment for 2 weeks; the same 2 litter boxes that had been available to the cat in the previous apartment were available in the new apartment. Contrary to our advice, the cat had free access to all the rooms. The cat had defecated twice and urinated once on the floor of the kitchen and on cardboard boxes. We suggested that anxiety for the cat following introduction to a new environment could have contributed to these episodes (anxiety-related inappropriate elimination).<sup>3,4</sup> We reminded the owner to restrict the cat to a single room (with an enriched

environment, as previously discussed) when it was unsupervised. Also, the pheromone diffusers were to be routinely refilled, to facilitate adaptation of the cat to the new environment.<sup>17</sup> After 1 week of confinement, only 1 new episode of inappropriate defecation and no further inappropriate urination had occurred. The cat occasionally had diarrhea and small amounts of blood in the feces.

Twenty weeks after the evaluation, the cat was defecating in the litter box approximately 95% of the time. No further episodes of inappropriate urination had been detected. Small amounts of blood were occasionally visible in the cat's feces, but the feces typically had a firm consistency. A physical examination was performed by personnel at the primary care veterinarian's clinic. Results indicated the cat was in good physical condition, and its body weight had increased to 4 kg (8.8 lb). No diagnostic tests were performed at that time. Six months after the evaluation at our hospital, the cat was consistently using litter boxes for urination and defecation. Blood was occasionally found in its feces, and the feces were firm. The owner reported that she was pleased with the outcome of the behavioral treatment for the cat, although she was aware of the ongoing, chronic GI tract problems.

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a. Feliway diffuser, Ceva Animal Health, St Louis, Mo.

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