MANAGING THE FERRET WITH THE ENORMOUS SPLEEN

Nico J. Schoemaker, DVM, PhD,
Diplomate ECAMS and ABVP-Avian
Division of Avian and Exotic Animal Medicine
Faculty of Veterinary Medicine
Utrecht University, Utrecht, The Netherlands

The spleen in ferrets is usually large to huge in size. Based on the frequency of seeing large spleens in ferrets, one may actually speculate that a large spleen is normal for ferrets. The differential diagnosis includes extramedullary hematopoiesis, lymphoma, myeloid tumor, hemangioma, hemangiosarcoma, Aleutian disease, and idiopathic hypersplenism.

In the majority of cases an enlarged spleen is an incidental finding during a physical exam. The inexperienced veterinarian may consider the “abdominal mass” a point of concern. The more experienced veterinarian will take different points under consideration before being concerned about the mass. One of the first things to consider is: “Why is the animal presented to a veterinarian and can the “mass” be linked to this complaint?” In a ferret with symmetric alopecia, for instance, signs cannot be explained by the finding of an enlarged spleen. Anorexia and abdominal enlargement, on the other hand, may be associated with the spleen. Another point to consider is: “How large is the spleen and are any irregularities palpable?” In extreme cases, the spleen may fill up most of the abdominal cavity. In case of lymphoma or other neoplasia, the border of the spleen will lose its sharp edges and lumps may be identified during abdominal palpation.

HISTORY
Clinical signs that are often associated with an enlarged spleen are abdominal enlargement, difficulty ambulating, anorexia, pale mucous membranes (or pale eye color in albino ferrets), and lethargy. Since many of these signs are nonspecific, a complete history should be taken including all of the regular internal medicine questions.

PHYSICAL EXAMINATION
The most important part of the physical examination is the abdominal palpation. This is often most easily performed with the one-hand technique, whereby the thorax is supported in one hand, while the abdomen is carefully palpated with the other. Special attention should also be paid to the circulatory system (pulse frequency, heart murmurs, and mucous membranes), and lymph nodes.

SPECIFIC TESTS
On radiographs an enlarged spleen may be identified. However, no information will be obtained with this technique regarding texture and masses that may be present within the spleen. The most important method to evaluate the spleen is ultrasonography. This technique enables accurate visualization of size and texture of the spleen, as well as additional structures within the abdomen. A homogeneous texture and smooth edges of the spleen are more often associated with benign processes, such as extramedullary hematopoiesis. A mottled appearance or areas of poor echogenicity are suggestive of a neoplasm. Fine-needle aspiration biopsies can usually be performed without the guidance of ultrasound. The disadvantage of taking biopsies in this fashion is that a normal area of the spleen may be sampled, while pathology is present within other areas of the spleen. The author therefore only takes samples under ultrasound guidance, with the ferret under anesthesia with isoflurane. The needle is directed to the affected area, increasing the likelihood of obtaining a diagnostic sample. In case of lymphoma, a homogenous population of (atypical) lymphocytes will be found. A mixed population of lymphocytes and leukocytes points towards a reactive spleen, while a population of mature and immature erythrocytes is suggestive of extramedullary hematopoiesis. A lymphocytic-plasmacytic infiltrate may be an indication for Aleutian disease.

Since hypersplenism has been associated with anemia, leukopenia, and/or thrombocytopenia, it is advised to obtain a complete blood count in ferrets with a large spleen. It is also important to include a reticulocyte count to determine if there is sufficient erythropoiesis.

MANAGING THE LARGE SPLEEN
In the majority of cases no interference is necessary when a large spleen is found. The cause for the extramedullary hematopoiesis is unknown, but it usually does not pose any threat to the well-being of the ferret. When the spleen is so large, however, that it fills up the entire abdominal cavity, a splenectomy may benefit the ferret. The author was initially taught that the erythrocytes produced by extramedullary hematopoiesis in the spleen did not come into the circulation, but has discovered since that this is not the case. Removing a spleen may therefore have serious consequences to the turnover and production of erythrocytes. A bone marrow sample therefore should always be taken prior to removal of the spleen to ascertain adequate erythropoiesis.

In case of lymphoma or other neoplasms, the spleen should be surgically removed. It is important to know whether metastasis or other organs are involved, which can be evaluated by use of diagnostic imaging techniques such as survey radiographs and ultrasound. In those cases, additional chemotherapy may be necessary.

Hypersplenism
Hypersplenism has been described as a rare condition in ferrets in which excessive destruction of circulating blood cells takes place within the spleen. The presence of a cytopenia combined with normal, active bone marrow, in absence of an infection, neoplasm or other cause of a cytopenia, would be suggestive of
hypersplenism. The suggested treatment is splenectomy.

The author has seen a case resembling hypersplenism. The animal was a 5-year-old, male neutered ferret that was presented with lethargy, difficulty ambulating, and a distended abdomen. Abdominal palpation revealed an enormous spleen. Complete blood count (CBC) revealed a packed cell volume (PCV) of 27%, a white blood count (WBC) of 2.0 x 10^9/μL, a thrombocyte count of 122 x 10^3/μL, and a reticulocyte count of 38.4%. One week later the PCV was 26%, the WBC 1.0 x 10^9/μL and the thrombocyte count 29 x 10^5/μL. The reticulocyte count was 35.3% at this time. It was then decided to evaluate the bone marrow by use of an aspirate biopsy, which was considered within normal limits. Based on these findings hypersplenism was the tentative diagnosis, and the spleen was surgically removed. One month after surgery, however, the ferret’s hematologic values had not improved: the PCV was 21% and the WBC 2.1 x 10^9/μL. The thrombocyte count had increased to normal values: 709 x 10^3/μL. The reticulocyte count, however, had decreased dramatically to 1.9%. By removing the spleen we had thus converted a regenerative anemia into a nonregenerative anemia. Histology of the spleen only showed extramedullary hemotopoiesis. Despite many efforts, we were not able to find a specific cause for the anemia and the ferret died 5 months later.

SUGGESTED READING