

What's Your Diagnosis? Interactive exotic pet cases
Mark A. Mitchell, DVM, MS, PhD, DECZM (Herpetology)
Louisiana State University, Baton Rouge, LA, USA

Veterinarians working with exotic pet patients are routinely presented with challenging cases. The purpose of this presentation is to provide attendees with a series of exotic pet cases in an interactive forum and discuss different diagnostic and treatment approaches.

A thorough anamnesis (history) is an essential component to working up an exotic pet case. Many of the problems encountered with captive exotic pets are directly related to inappropriate husbandry factors. Understanding how the animal is housed, including physical enclosure, substrate, and cage furniture, can tell us much about their potential exposures to physical injury (e.g., small enclosure, metal running wheels), gastrointestinal blockage (e.g., ingesting certain types of substrates), or chemical injury (e.g., epistaxis with cedar substrate). Additionally, a thorough anamnesis can provide insight into potential nutritional concerns for these species. For example, rabbits and guinea pigs not fed long-stem hay may be predisposed to dental and/or gastrointestinal diseases. Finally, asking clients about their experience with their pets (e.g., handle daily, afraid to handle) can provide insight into how we can best achieve owner compliance with treatment protocols and plan accordingly.

A thorough physical examination should be performed on every exotic pet patient. The physical examination serves as the single most important “diagnostic test” being performed. How the veterinarian pursues a case will greatly depend on what they do or do not find on an examination; thus, an incomplete examination can send us down the wrong path. The overall sensitivity and specificity of a physical examination should increase as we gain experience, leading us to reduce the likelihood of false negative or false positive findings; however, if we alter the thoroughness of our exam over time (i.e., I don't need to do the exam as thoroughly because I am experienced and know what I don't need to do), we may actually find we do a poorer job with our case management. The physical examination can also be used to develop an initial prognosis regarding the case. In the case of many exotic pets, sedation may be used to help reduce stress associated with an examination.

Diagnostic tests can be invaluable in confirming a specific disease process associated with a case. A complete blood count (CBC) can be used to evaluate the likelihood of an inflammatory response within the animal. In general, white blood cell counts of exotic pets range from 5-15,000 cells/ml. Elevations in WBC can be attributed to inflammation and stress. To isolate these, it is imperative that a differential count be done to determine the most likely cause of the leukocytosis. With stress leukograms, a neutrophilia (heterophilia), monocytosis, lymphopenia, and eosinopenia are common. In general, inflammatory leukograms are characterized by an inverse neutrophil (heterophil):lymphocyte ratio, neutrophilia (heterophilia), and monocytosis (chronic). Inflammatory leukograms can occur because of an infectious disease, toxin, neoplasia,

trauma, or foreign body. In many cases, veterinarians attempt to associate inflammatory leukograms with an infectious etiology, when the etiology may not be infectious. The CBC also provides information regarding the erythron. In general, exotic pets should have a packed cell volumes of 20-40% (reptiles), 30-55% (mammals), and 40-55% (birds). If anemia is confirmed, then attempts to classify the anemia (regenerative, non-regenerative) should be made.

Exotic pet patients are stoic animals that can mask their illness. Serum/plasma biochemistry analysis can be used to evaluate physiologic disturbances in these animals. Many of the same biochemistries used to assess domestic mammals can be used in a similar manner for exotic pets. Blood urea nitrogen and creatinine can be used to assess hydration and renal status in mammals, whereas uric acid is better for birds and reptiles. The electrolytes can provide insight into hydration and nutrition status. The enzymes are not very organ specific, but can provide some insight into certain systems, such as creatine kinase and the skeletal system. The biochemistries should be evaluated *en total* versus as individual parameters to screen for potential patterns for disease.

Radiographs can be quite useful in exotic pets to assess multiple systems, but especially the gastrointestinal tract in exotic small mammals. Hindgut fermenting rodents and lagomorphs commonly present for gastrointestinal obstruction or stasis. Radiographs can be used to assess for the extent of disease and guide treatment. When evaluating a fracture, it is important to consider which bone is affected, the location of the fracture (e.g., metaphysis, epiphysis, diaphysis), type of fracture (e.g., transverse, spiral, oblique), whether the fracture is open or closed, and whether there is soft-tissue and joint involvement. Evaluating the extent of soft-tissue injury associated with a fracture is necessary to estimate the convalescence period that will be required for the patient. A minimum of two high-quality images is required to fully evaluate an injury. Radiographs can also be used to evaluate the extent of disease associated with non-traumatic injuries too. Ultrasound imaging is another invaluable tool for assessing abdominal and thoracic organs of exotic small mammals.

Microbiological culture is an important diagnostic tool for veterinarians. Historically, veterinarians managed most infectious diseases as a primary bacterial disease. We now realize that bacterial infections, at least in some cases, are secondary opportunists that occur following viral infections. When submitting microbiological samples, it is important to consider not only bacterial microbes, but fungi too. Performing a cytological examination prior to submitting a sample is strongly recommended, and may be useful in guiding a diagnostic laboratory. Laboratories should be made aware of specific pathogens if they are suspected in a case to increase the likelihood of isolating them in culture. For example, *Pasteurella multocida* is a common pathogen in rabbits, but can be quite fastidious. By making the laboratory aware of this suspected pathogen, they can alter their culture methods to increase the likelihood of recovering the organism.

The advancement of serological and molecular diagnostic assays has improved the veterinarian's chances of making an ante-mortem diagnosis for an infectious disease. While there remains much to be desired, we are making strides. Serologic testing for *Encephalitozoon cuniculi* can provide insight into potential exposure for rabbits. Additionally, polymerase chain reaction-based assays can be used to diagnose shedding of the organism.

Necropsy, and subsequent histopathology, is often necessary to confirm a diagnosis in a case. This is especially important in the face of an epizootic. Veterinarians should take appropriate precautions when performing a necropsy on an exotic pet patient. Because many infectious diseases can be transmitted via aerosolization, necropsy should be performed under a negative pressure hood. Veterinarians should submit samples to a pathologist that is familiar with exotic pets.

Success with exotic pet cases requires a thorough and well thought out diagnostic plan. Historically, exotic pet cases were approached by performing few diagnostics and administering empirical therapeutics. By practicing the same good standard-of-care expected for domestic pets, veterinarians will find improved success with their exotic pet cases.