

## **Avian Radiology**

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### **Radiology**

Radiology is an important part of the diagnostic process that tends to be underused in pet birds. Because of the extensive air sac system in the avian patient, radiographic contrast is usually good. A grit-filled ventriculus (gizzard) can serve as a useful landmark, particularly in the small bird. (Its position is left of the body midline, at the level of the acetabulum or hip socket.) Radiographs have been helpful for diagnosing such conditions as heavy metal toxicosis (poisoning), noted by the observation of metal fragments on the radiograph, and fluoroscopic studies (not practical in typical small animal practice settings) have shown promise in the early identification of abnormal gastrointestinal motility, such as occurs with proventricular dilatation disease, in psittacines. As with other procedures, however, it is important to consider the bird's condition and whether it will be able to tolerate the stress and handling while undergoing a radiographic procedure.

Restraint is very important during avian radiology. Many practitioners prefer to use anesthesia during the procedure, since manual restraint techniques can be stressful to the bird and result in movement or poor positioning. Obviously, there are advantages and disadvantages for using and not using anesthesia. If other diagnostic and treatment procedures are to be carried out, the use of a relatively safe anesthetic, such as isoflurane, is generally a good idea to assist in minimizing stressful handling time. In our practice, we rarely use anesthesia for routine radiographs as our staff is highly skilled with handling the birds to minimize stress. With the extremely short exposure time for the radiographs it is very infrequent for a radiograph to be retaken because of movement. If ever anesthesia was to be used, the owner would be notified.

The recommended film screen combination for avian radiology is a high-detail rare earth system. An avian radiographic technique chart will list a fixed mAs; the mAs and time remain constant and the kVp is adjusted for changes in patient size. As with other species, short exposures—faster than 1/60 second—are preferred.

Because abdominal structures are often poorly defined on plain films, a barium series may need to be performed. Not only is this a highly effective diagnostic tool, but it is also extremely simple to perform. A contrast medium is frequently used with avian patients to identify the course and size of the gastrointestinal (GI) tract divisions and to identify obstructions, masses, and foreign bodies. Barium is the preferred contrast medium. It is a metal so the x-rays do not penetrate the solution (it appears white). It is the consistency of a milkshake so it is actually soothing to the digestive tract. As it flows through the digestive tract you can check the appearance of the tract and see if there are obstructions, tumors, thickenings, foreign bodies or other abnormalities. In addition, if there are abnormalities in the internal organs, such as enlargements, they may displace the position of the intestinal tract or stomach giving a clue to what may be occurring internally. A good example would be an ovarian tumor. As the ovary is on the left side of the abdomen, a tumor would push the stomach forwards and the intestinal tract to the right side of the abdomen. Seeing these changes in position by use of the barium it would provide the information needed to diagnose an ovarian tumor.

To perform the procedure, barium is gavaged directly into the crop at the same volume as would be used if the bird were being supplementally fed. The contrast medium will usually be present in the lower GI tract within 1 hour; however, transit time will vary with the location in the intestinal tract, and pathologic conditions such as cancer or foreign bodies can alter the passage of barium. Typically, the barium in a normal bird will move through the entire tract in about 2 -2 ½ hours. Because the transit of barium may be rapid through the GI tract, radiographs of the upper GI system should be taken immediately and then at 5,

10, and 30 minutes. Radiographs of the lower GI tract should be taken at variable times, depending upon how far along in the tract the area of interest is located.

There are variations between the different species and age-groups of pet birds. It is important to recognize, for example, that juvenile psittacines normally have a comparatively large GI tract which should not be mistaken for abdominal dilatation.

We have been using digital radiography since January of 2007 and it has been a tremendous aid for our diagnostic capabilities. With our digital system we are able to capture the images digitally (no more x-ray films) and the images are then stored on our computer system. We are then able to bring up the images on any of our computers in the hospital, making access very easy and also useful if we would need to send an image to a board certified radiologist for evaluation of a case. We are able to perform a number of manipulations on the images such as enlarging them (great for the small birds) to better view abnormalities. We can also change contrast and clarity so an image can be adjusted to be as sharp as possible. We cannot imagine being without digital radiography. Obviously, in the long run you and your pets benefit from this technology as well.