**Ultrasound in Birds: From Finch to Goose**

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1. Introduction
   1. The avian diagnostic work up has historically been based on physical examination, hematology, blood chemistry, and radiography. Together with endoscopy this approach can provide important information.
   2. Ultrasonography has become an increasingly important diagnostic tool in avian medicine.

* Advantages of ultrasonography (U/S) over celioscopy or CT scan in the avian patient?
  + Non-invasive when compared to endoscopy
  + U/S is available in nearly all veterinary hospitals
  + U/S allows us to visualize the interior of organs (compared to celioscopy)
  + FNA of selected and precise parts of the tissue/organ
  + Low budget compared to CT scan
* Disadvantages or challenges of U/S
  + Size: In my experience, U/S is feasible in birds as small as a 12-gram Gouldian finch
  + Air sacs, their presence causes reflection
    - Extension of air sacs differ from species to species
    - Depending on our area of interest and the species, the probe can be placed
      * Ventrally (caudal to the sternum)
      * Laterally (parasternal), ex: chicken
    - Lack of literature, lack of reference values can cause difficulties in interpretation of pathologies
* How to perform U/S in birds
  + Many birds are anorectic when presented to the vet, but if the animal is eating fasting is often recommended for better visualization and when anesthesia is needed
  + Fasting times vary by species
    - Songbirds (finches) should not be fasted (rapid GI transit time)
    - Parrots 3-6 hours
    - Vultures up to 48 hours
* Anesthesia?
  + Evaluate each case separately
  + Pros
    - Minimizes stress
    - Relaxes abdominal musculature
    - Improves access to acoustic windows
  + Cons
    - Risk in a probable sick bird
    - Changes cardiovascular properties
    - Short exam time to reduce anesthesia time
* Indications for U/S exam
  + Suspect reproductive tract disorders
    - Egg binding is a common presentation
      * An egg w/o shell is not visible on survey radiographs
      * Multiple eggs can be present in the oviduct
      * To improve the accuracy of the prognosis in egg binding cases, an U/S exam is essential
    - Case examples include…
      * Active ovary
      * Eggs
      * Ovocentesis
  1. Suspect hepatopathies
     1. Evaluate hepatic vessels and texture of the liver
     2. In mammals we compare the echogenicity of the spleen and fat with the liver but this is rarely possible in birds
     + Can compare echogenicity of fat in obese birds
     + Case examples include…
       1. Normal liver
       2. Hepatic cysts
       3. Hepatitis
       4. Toxoplasmosis
       5. Hepatic lipidosis
* Suspect cardiopathies, hydropericardium
  + Cardiopathies are very common in birds
  + Case examples include…
    - Normal heart
    - Hydropericardium
    - Cardiac lipidosis
* Gastrointestinal examination
  + Evaluation of the stomach and intestines is always a part of a complete U/S exam
    - Proventriculus is easiest to see in parasternal view
    - Typical layers of the intestines (as seen in mammals) may not be visible, depending on patient size
  + Case examples
* Eye
  + Sterile U/S gel
  + Pressure on the eye can stimulate the vagal reflex
* Planning surgeries of tumors, cysts, or other masses
  1. U/S-guided fine-needle aspirate
  2. Follow-up treatment outcome