PET CHICKEN MEDICINE AND SURGERY

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In this author’s practice, pet chickens represent an increasing number of avian patients presented per year, as well as a growing percentage of the overall pet bird species seen and treated each year. Since 1995, pet chickens have represented 1% of overall avian patient accessions in this author’s avian-exclusive practice, and 140% of the average patient transaction charge. When these birds are kept as companions, the nature of the human–animal bond can be quite strong, and they are increasingly being presented for veterinary evaluation, diagnosis, and appropriate therapy. Often, standard production-oriented poultry medical approaches will fall far short in addressing the individual pet duck or chicken with a problem as it presents to the private practitioner. Necropsy, as a preferred diagnostic tool of poultry medicine, is overall not an acceptable option for the pet bird owner in most settings. This discussion will describe some of the unique aspects of anatomy and physiology of these birds, and some of their common medical conditions and their specific diagnostic and treatment modalities.

Historically, southern and southeast Asia is thought to be the origins of the domestic chicken, perhaps the most universally popular source of meat in the world. Four species of wild jungle fowl are still known in that area: Gallus gallus (the red jungle fowl), Gallus lafayeti (the Ceylonese jungle fowl), Gallus sonnerati (the grey jungle fowl) and Gallus varius (the brown jungle fowl). The red jungle fowl, Gallus gallus, has long been considered the progenitor of the domesticated strains and breeds of today. There are multiple different breeds of chickens today, ranging from the small bantam varieties, to the large meat production breeds, the egg production breeds, and the fancy or show chicken breeds. The American Standard of Perfection lists almost 200 breeds. Many of these different breeds of birds are kept and maintained as pets. Young female chicks are called pullets, young males are called cockerels, adult males are called cocks or roosters, and adult females are called hens.

ANATOMY

Some unique or pertinent anatomic considerations of companion chickens are pointed out below.

Integument

The color of the shank skin (tarsometatarsus) is dependent on the diet the bird is consuming (carotenoid pigment content) and the reproductive status of a hen; a leghorn hen that is in active lay or is consuming a large amount of yellow carotenoids will have yellow shanks, one that is not in lay will have white colored shanks. Dark coloration of the skin and shank in some breeds is due to other pigments in the epidermis and/or underlying dermis.

Musculoskeletal System

The musculoskeletal structure of the domestic chicken is similar to most other anisodactylous bird species. The larger meat breeds and varieties may be predisposed to excessively rapid growth, excessive weight, and musculoskeletal growth problems such as tibiotarsal rotation, perosis (slipped tendon). As fully grown birds, these breeds are predisposed to degenerative joint disease and arthritis.

Gastrointestinal System

Chickens have simple digestive systems, and rely minimally on bacterial fermentation to aid in digestion. Most digestion occurs as a result of acid and enzymatic secretions, as opposed to fermentation. Since there is no specialized area in the digestive tract for bacterial action to aid in the breakdown of foodstuffs, only feed materials that can be digested by the enzymes secreted are useful as food. The ceca of the chicken are bilaterally located at the junction of the large intestine and the colon, and are the site where some fiber fermentation can occur in the chicken. The ceca of the chicken are about 4 to 6 inches long.

Respiratory System

The opening of the trachea is very distal at the base of the tongue. Comparatively small endotracheal tubes are needed for intubation as compared to the relative size of the birds. The tracheal rings of the chicken are complete, and therefore, predispose to iatrogenic trauma should an endotracheal tube be inflated excessively. Inspiration is accomplished primarily by a lifting action of the sternum, which may be difficult in heavy breeds and varieties when maintained in dorsal recumbency during restraint or anesthesia.

Circulatory System

A typical heart rate of a resting chicken is about 350 beats per minute. Larger breeds such as the Rhode Island Red have a lower heart rate, averaging about 250 beats per minute. An acute stressor in a day old chick has been shown to increase the heart rate from 300 beats per minute to 560. The deep body temperature of mature chickens is about 107.4°F.

Reproductive System

Calcium stores in the skeleton of the domestic chicken are only sufficient to provide eggshells for relatively few eggs. Laying hens lose about 40% of their total skeletal calcium is after laying only 6 eggs when they receive a diet containing a low amount of calcium. The incubation period for the domestic chicken is 21 days.

RERAINT

Physical restraint is generally not challenging or difficult with chickens. Unlike parrots, a painful bite is not a realistic concern. A calm and gentle approach will usually allow a full physical examination and some minor procedures to be performed, with the bird standing at
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rest on the exam table. Some birds will remain calmer if their head is lightly covered with a towel or hand.

**VENIPUNCTURE**

Blood samples can be easily obtained from the jugular vein (right is most convenient, but left can be used), the cutaneous ulnar vein, or the median metatarsal vein. Needle sizes that are used can range from 28 gauge to 22 gauge. Typically, a full biochemistry profile and CBC can be obtained from a sample volume of 0.5 ml; however, larger volumes of blood can be collected and serum saved for potential future use, if needed.

**ANESTHESIA**

Preoperative and perioperative analgesia principles are applied with pet chickens, as would be with other avian species. Most often, general anesthesia can be induced in chickens with inhalational agents. In some circumstances, injectable products such as medetomidine, ketamine, diazepam, or others may be used to aid in reducing induction time. Intubation, intermittent positive pressure ventilation and temperature, pulse, and ECG monitors are commonly utilized in this author's practice. Heavy bodied birds may be prone to hyperthermia, and may have difficulty ventilating if positioned in dorsal recumbency. Thermal support for the medium to small body weight birds may be accomplished by circulating heated air systems (Bair hugger, etc), or by the use of a radiant overhead heat source. Circulating hot water heat sources may be less effective for thermal support for most chickens, except for the larger, heavy bodied varieties.

**NUTRITION**

A primary diet of commercial layer ration is desired for pet chickens during active reproductive cycles. Maintenance diets can be fed during periods of reproductive quiescence. Chicks should be fed a starter or grower ration, with the duration of this diet depending on their age, breed, and desired rate of growth. Malnutrition is a common problem in companion chickens, most often manifested in laying hens, as opposed to roosters. Diets heavy in grains, such as scratch, are fed, predisposing to inadequate calcium availability for laying hens, and reproductively associated problems as a secondary event. Osteoporosis (layer fatigue) is also not uncommon. Some diets with added spinach or chard can also potentially augment calcium availability issues in chicks or adult hens, through the binding effects of their oxalates on calcium in the gut. Obesity is a commonly encountered problem in companion chickens.

**REPRODUCTIVE TRACT DISEASE**

**Egg Yolk Coelomitis**

Egg yolk coelomitis is a fairly common clinical problem encountered in chickens. Historically, these patients may have a past of known recent reproductive activity, but this may not always be noted by their owners. General malaise, ill-thrift, decrease in physical activity, and sometimes a delayed molting process all can be seen. Not all will demonstrate these clinical signs, however, and abdominal distention may be the only observation made by the owners of these pet birds.

**Physical Examination Findings.** At physical examination, birds may present with palpable abdominal distention of a considerable degree. Fluid may be appreciable by allotment of these distended abdomens. There may be mass-effects noted at palpation, consistent with displacement of the ventriculus, soft shelled or firm shelled eggs in the oviduct, ectopic eggs free within the abdomen, or even ovarian masses. The birds may show some mechanically induced respiratory difficulty due to the pressure and space occupying nature of the coelomic fluid present. Due to abdominal distention, there may be accumulation of feces to the feathers below the vent, producing a dermatitis, or even predisposing to fly strike in some birds.

**Laboratory Findings: Complete Blood Count (CBC).** Normally, most hens will demonstrate a mild to moderate elevation to their total white cell count when ovulating, which resolves in approximately one week without treatment being necessary. It is not uncommon to see an acute elevation in absolute and relative eosinophil counts, which will be followed by a rise in absolute or relative basophil counts as the acute component of the normal post ovulatory inflammatory process begins to resolve. There may be a normal to slightly low hematocrit noted in hens during a period of active lay. Some hens with chronic yolk coelomitis may have a depression anemia present, with hematocrits as low as 30% or more, with minimal polychromatophilic red blood cells noted in peripheral smear to suggest active regeneration.

In birds with subclinical to mildly clinical reproductive tract disease, a relative or absolute heterophilia may be seen with or without a persistent basophilia. As is seen in the normal postovulatory setting, when there is a mild yolk coelomitis noted in the immediate area around the infundibulum, a mild to moderate absolute or relative eosinophilia may be noted in the acute phase of the inflammatory process. As this resolves, basophils tend to increase in absolute and/or relative count, and then decline in number slowly over time. These patients typically will not require medical intervention to return to clinical and hematological normalcy.

Some forms of septic yolk coelomitis, particularly when in their acute phase, may demonstrate a relative and/or absolute leukopenia. Most confirmed yolk coelomitis diagnoses in avian patients, in this author's experience, are non-septic, however.

In the chronic forms of yolk coelomitis, the hens more often appear hematologically normal, with the exception of a mild depression anemia. Although not specific for reproductive tract disease by any means, observation of a persistently low resting hematocrit and normal to decreased reticulocyte percentages should serve as a trigger for further diagnostic investigation and/or therapeutic intervention. In those birds with even a more severe and advanced state of chronic yolk coelomitis, more obvious and classically reported clinical signs
including respiratory difficulty, abdominal distention or ascites may be seen.

**Biochemistries.** In the hen that has acute egg yolk coelomitis, hypercalcemia, elevated total serum protein, and hypercholesterolemia may be seen on a standard biochemical profile, supporting the presence of reproductive activity in the bird. These changes are much less frequently seen in the chronic yolk coelomitis patient, however.

**Diagnosis and Treatment.** Definitive diagnosis of yolk coelomitis may require radiography, ultrasonography, laparoscopy, or laparotomy. Mild, aseptic yolk coelomitis may not require specific therapy, other than time and rest. In this author's experience, aseptic yolk coelomitis is significantly more common than the septic form. As such, antibiotic therapy is potentially less indicated as a general rule of empirical therapy of many confirmed or suspected patients with egg yolk coelomitis. More severe or chronic yolk coelomitis patients will often require surgical intervention as a part of successful and definitive resolution of the problem. A left flank laparotomy or mid ventral laparotomy can be used for surgical approach, with the left flank being the more commonly utilized in this author’s practice. A partial or complete oophorectomy, salpingo-oophorectomy and removal of retained yolk from the coelom may be required individually or in combination for any single individual patient.

**Salpingitis / Oophoritis**

Historically, birds with salpingitis or oophoritis commonly have no recognizable and easily attributable clinical signs by their owners to reproductive tract disease. A history of laying persistently infertile eggs in spite of being in the presence of a breeding male, episodic or progressive abdominal distention, laying soft shelled eggs, or signs attributable to a secondary yolk coelomitis from these conditions may be told by the owners, on careful questioning.

**Physical Examination Findings.** At physical examination, birds may present with palpable abdominal distention of a considerable degree. Fluid may be appreciable by ballottement of these distended abdomens, particularly where there are cystic ovarian changes present. The impacted oviduct may not be palpable during physical examination.

**Laboratory Findings: Complete Blood Count (CBC).** Overall, most forms of oviductal disease have not been seen to correlate with significant hematologic or biochemical abnormalities. Birds with cystic or early neoplastic ovarian disease, however, may be recognized similarly as seen in yolk coelomitis patients as secondary yolk coelomitis can often accompany neoplastic ovarian or oviductal disease, and these birds may initially present with a clinical manifestation characterized merely by yolk coelomitis. The laboratory findings in these patients will often reflect the combined effects of these disorders in the bird at that point in time, as well as the hen's ability to sequester, localize and/or wall-off the inflammatory processes.

**Biochemistries.** Typically, most patients with salpingitis or oophoritis have few consistently reliable biochemical abnormalities identified.

**Diagnosis and Treatment.** As in yolk coelomitis, definitive diagnosis of salpingitis or oophoritis may require radiography, ultrasonography, laparoscopy or laparotomy. A partial or complete oophorectomy, salpingo-oophorectomy and removal of retained yolk from the coelom may be required individually or in combination in selected individual patients. Infectious oophoritis can include bacterial or fungal agents, once a clear diagnosis has been established, appropriate and aggressive therapy should be applied. Cystic ovarian disease may be primary or secondary to infectious or neoplastic ovarian disease. Early diagnosis is an important key in successful therapy in the majority of these patients.

**MAREK’S DISEASE**

**History and Physical Examination Findings.** This herpesviral disease of chickens is not uncommonly encountered with companion pet birds. Typically, afflicted birds range from as young as 5 to 8 weeks of age up to three or more years. The onset of clinical signs will be comparatively rapid, with a course of clinical illness noted by owners for one day to two weeks. The most common observations made in the author's practice include progressive neuromuscular weakness, an inability to stand or use the legs, in the presence of an otherwise alert bird. Although some presentations may be unilateral in lameness, a progression to bilateral disease is most commonly seen.

**Laboratory Findings: Complete Blood Count (CBC) and Biochemistries.** Laboratory testing results are usually comparatively unrewarding in most Marek’s disease patients. Often, these birds will have a normal hemogram. Biochemically, elevations in CPK (2-3 X normal ranges or greater) may be noted in the more acute phase of disease in some birds.

**Diagnosis and Treatment.** Definitive diagnosis is established at necropsy, specifically by histology of the peripheral nerves of most of these afflicted patients. There is no specific therapy for this herpes viral disease; however, changes in management of some collections, in conjunction with the introduction of only vaccinated birds in the future, will reduce the incidence significantly in many cases.

**UPPER RESPIRATORY DISEASE**

**History and Physical Examination Findings.** Birds with upper respiratory diseases are typically presented with persistent nasal discharge, conjunctivitis, epiphora, coryza, swollen or distended sinuses, coughing or tracheal “clicks” or wheezes. More often than not, these birds will have a chronic history, rather than a history compatible with an acute onset.

**Laboratory Findings: Complete Blood Count (CBC) and Biochemistries.** Upper respiratory tract infections usually are not represented by any significant or consistent abnormalities in the peripheral hemogram or biochemical profile. Definitive diagnosis of the
infecting agent(s) is accomplished by nasal, choanal, or sinus aspiration and microbiological assays to identify or isolate. The etiologic agent(s) of clinical tracheitis is often identified by a combination of serology, deep tracheal culture, cytology, and/or endoscopy. Serology may be a particularly valuable screening tool in diagnosis of the presence of many of the common poultry pathogens, utilizing the local state poultry diagnostic laboratories. Primary etiologies of upper respiratory disease in poultry may include a host of viral, bacterial, fungal, parasitic, toxic, or mechanically irritating agents.

Nasolacrimal ducts can potentially have plant awns (foxtails) seeding secondary infection.

LOWER RESPIRATORY DISEASE (PNEUMONIA, AIR SACculitis)

History and Physical Examination Findings. When afflicted with lower respiratory tract disease, most pet poultry species will demonstrate fairly serious clinical signs, including increased respiratory difficulty, exercise intolerance, openmouthed breathing, weight loss, and anorexia. Abnormal air movement sounds are comparatively rarely ausculted in the lungs of diseased birds with pneumonia, although air sac “crackles.”

Laboratory Findings: Complete Blood Count (CBC) and Biochemistries. Infectious disease processes involving lung or air sac tissue are typically associated with a significant leukocytosis (>3x normal), which is often accompanied by a relative and absolute heterophilia. Those patients that are more chronically afflicted may demonstrate a depression anemia, as is seen with many chronic disease processes. Polycythemia secondary to chronic lower respiratory tract disease, as identified by an elevated hematocrit and total red blood cell count, is rarely seen in pet chickens. Typically, biochemical abnormalities are rarely noted as a consistent finding in birds with lower respiratory tract disease.

Diagnosis and Treatment. Definitive diagnosis of lower respiratory tract disease is established by use of serology, radiography and/or endoscopy. Therapy is targeted to the specific etiologic agent identified, and, is often comparatively long term, continuing up to and beyond one year in some cases.

PARASITIC DISEASES

Knemidocoptic mange is occasionally noted in pet chickens. The etiologic agent of this disease is Knemidocoptes pilae, a sarcoptiform mite. These mites live out their entire life cycle on their hosts. Typically, the crusty and scaly dermatitis associated with this mite is seen at the feet and legs, as may be seen in some pet canaries or budgerigars with the same problem. Facial lesions, however, are particularly uncommonly seen in chickens. A suggestive diagnosis can be established by physical examination findings of a “honeycombed” appearance to the crusts and scales on the feet and legs, or by skin scraping. Treatment is with ivermectin, which may be repeated in 2-week intervals for 2 to 3 total treatments. Not all birds exposed to a bird with this condition necessarily will develop problems, and group treatment is not necessarily always required.

The northern fowl mite, Ornithonyssus sylvarium, can be associated with head shaking, and localized dermatitis of the head, ears, and vent regions of some pet chickens. Ornithonyssus remains on the bird throughout most of its life cycle. These small mites can often be seen at examination, or by tape preparation examination. Light dusting of the birds with 5% carbaryl or pyrethrins should be effective in treatment and control of this problem.

Intestinal infestation with Ascarids can be seen in companion chickens. Ascaris galli is not a chicken-specific parasite, and can be shared between gallinaceous birds and parrots. Weight loss, ill thrift, and other nonspecific clinical signs may be attributed to intestinal nematodiasis. Ova may be detected via flotation examination, but are not consistently shed, and can be missed on a single flotation examination. Capillaria spp infestations can also be seen, and may be diagnosed via fecal flotation or crop wash samples. Treatments for these nematode infestations can include a variety of anthelmenthics such as ivermectin, fenbendazole, pyrantel, and others, with the understanding that a clear drug withdrawal time for human consumption of eggs is frequently not clearly known.

References available from the author upon request.