

## AVIAN REPRODUCTIVE DISORDERS

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**Abstract**

Avian reproductive disorders are commonly diagnosed in pet birds, backyard flocks, and commercial aviaries. Birds that are diagnosed with reproductive disorders can present with a variety of clinical signs that range from benign disorders to life-threatening emergencies. In many cases there are underlying husbandry and management issues that need to be addressed. This article will address the presenting signs of common reproductive disorders in avian species and the best approaches to determine appropriate diagnostic and treatment plans. Copyright 2012 Elsevier Inc. All rights reserved.

**Key words:** avian; emergency; hormones; husbandry; reproduction

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**A**vian reproductive disorders are commonly diagnosed in pet birds, backyard flocks, and commercial aviaries. Birds affected by reproductive disorders can present with a variety of clinical signs that range from benign disorders to life-threatening emergencies.<sup>1-8</sup> Often there are underlying husbandry and/or management issues associated with the reproductive disease condition that need to be addressed. Depending on the underlying disease etiology, clinical signs may be as vague as depression, lethargy, hyporexia, and fluffed feathers. A thorough patient history and a complete physical examination will aid in determining the definitive diagnosis of reproductive disorders. Further diagnostic testing may include complete blood counts (CBC), plasma biochemistry panels, diagnostic imaging, and fecal analysis.<sup>1-23</sup> This article will focus on presenting signs of common reproductive disorders in avian species, as well as a structured approach for diagnostic testing.

Bird owners should have their animal's gender determined so that reproductive disorders may be prevented through proper care and oversight. Through the use of a single drop of blood allowed to dry on a piece of paper, DNA sexing is readily available from a number of commercial enterprises (Zoogen Services, Inc., Davis, CA USA, <http://www.zoogen.biz>; Veterinary Molecular Diagnostics, Inc., Milford, OH USA, <http://www.vmdlabs.com>; Avian Biotech, Tallahassee, FL USA, <http://www.avianbiotech.com>) with a typical turnaround time of 7 to 10 days. The reproductive cycle and onset of sexual maturity in female birds of many avian species are not fully understood, but photoperiod, seasonal changes, calcium homeostasis, and an increase in energy are thought to be influential factors.<sup>10,12,13,20,22</sup>

Several different hormones and prostaglandins play a role in reproductive activity. Luteinizing hormone stimulates the production of prostaglandins by the ovarian follicles. Parathyroid hormone-related protein is thought to promote relaxation of the proximal oviducts and cause an increase in blood flow in order to increase calcium transfer to the shell. Prostaglandin  $F_2\alpha$  ( $PGF_2\alpha$ ) causes shell gland contractions and prostaglandin  $E_2$  relaxes the uterovaginal sphincter and vagina, in addition to causing shell gland contractions.<sup>10,12,13,20,22</sup> Having an understanding of these processes will help to guide diagnostic and therapeutic choices when treating avian reproductive disorders.

Common presenting complaints from owners of female birds with reproductive disorders in-

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clude coelomic cavity swelling, respiratory distress, an abnormal stance, skeletal fractures, cloacal prolapse, anorexia, depression, paresis or paralysis, diarrhea, and changes in behavior. If the patient is unstable upon presentation, immediate critical care treatment may be required.<sup>3,6,8</sup>

## COMMON DISORDERS IN FEMALE BIRDS

### Chronic Egg-laying

Chronic egg-laying is diagnosed when a hen lays multiple clutches without the presence of a mate or normal breeding season.<sup>2</sup> Problems associated with chronic egg-laying arise when this condition becomes metabolically exhausting for the hen and predisposes the patient to other problems (e.g., hypocalcemia, egg-binding). Chronic egg-laying seems to be more common in lovebirds, cockatiels, and finches, but can occur in any avian species.<sup>8</sup> A thorough history that includes environmental assessment, social interactions, and diet must be collected on these birds to evaluate their ability to lay eggs. A workup should include a physical examination and routine diagnostic testing, including a CBC, plasma chemistry panel, ionized calcium, and diagnostic imaging. Depending on the patient's diagnosis and condition, recommended treatment options may consist of behavioral, pharmacological, nutritional, environmental, and surgical therapies. The GnRH agonist leuprolide acetate (Lupron; TAP Pharmaceuticals, Inc., Lake Forest, IL USA) has become one of the most commonly used hormones to regulate avian reproductive problems. Doses of leuprolide acetate administered to birds in veterinary practice range from 100 to 1200  $\mu\text{g}/\text{kg}$ .<sup>13,17</sup> Often, a combination of husbandry changes and pharmaceutical therapies may be warranted to adequately treat birds diagnosed with chronic egg-laying. Husbandry changes may include reducing the photoperiod, altering the diet, changing cage type, rotating furniture, changing the way the owner interacts with the bird, and identifying possible stressors affecting the animal.<sup>1-5,8,11,14,16,23</sup>

### Egg-binding and Dystocia

Egg-binding and dystocia are most commonly reported in cockatiels, lovebirds, finches, and canaries, but egg-binding can occur in any avian species. Egg-binding occurs when an egg does not pass through the oviduct at a normal rate and can be caused by malnutrition, stress, obesity, myopathies, lack of exercise, systemic dis-



**FIGURE 1.** Radiograph of egg-binding causing dystocia in a cockatiel.

ease, injury from a previous dystocia, or malformed eggs.<sup>1-5,8,11,14,16,23</sup> Dystocia is defined as an egg that is obstructing the caudal uterus and cloaca. Egg-binding often leads to dystocia, and the underlying causes for both disorders are similar. A familiarity of avian reproductive anatomy is crucial for one to understand and address these ailments. Common clinical signs associated with egg-binding and dystocia include depression, abdominal straining, persistent tail wagging, wide stance, failure to perch, coelomic distension, dyspnea, and sudden death. The lodged egg may compress the local vessels and nerves, causing lameness, paresis, paralysis, and organ perfusion problems. Pressure necrosis can occur because of the lodged, immovable egg on the oviduct wall, and metabolic disturbances may also occur as a result of abnormal defecation and micturition.<sup>1-5,8,11,14,16,23</sup> Often, a tentative diagnosis will be made based solely on the patient history and physical examination. Severely debilitated patients may not be able to survive increased diagnostic testing without stabilization and treat-

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