Diseases of the Uropygial Gland

Summary: The uropygial gland, when present, is a bilobed holocrinc gland with secretions that perform several functions in birds, including waterproofing (although not essential for it), manufacturing vitamin D precursors, keeping the skin, feathers, and bill supple, and performing antibacterial function. Many problems with this gland are secondary to hypovitaminosis A and and be corrected by moist hot packing, correcting the diet, and treating any secondary infections. Although impaction is often mentioned in the literature, this seems to not commonly occur. Diagnostics such as cytology, biopsy, aspiration, microbiology and histopathology may be used to procure a diagnosis. Surgery should only be attempted if medical management has been unrewarding, or if a tumor, abscess or rupture is present. Surgery requires excellent hemostasis and precise surgical technique.

Introduction

The uropygial gland, also called the preen gland or oil gland, is often overlooked during routine physical examination of birds. The avian practitioner should become familiar with the normal appearance of this gland (when present) to be able to identify abnormal glands. Most problems with the uropygial gland can be corrected by dietary and medical management, or rarely, surgery may be required. Not all species of birds have uropygial glands, and it is important to be knowledgeable about which species do, and which don't.

Anatomy and Physiology

The uropygial gland is a bilobed holocrinc gland. It is the principle cutaneous gland of birds. It is present in most species of bird, and it is relatively large in some aquatic species. It is absent in other species, including the ostrich, emu, cassowary, bustard, frogmouth, many pigeons, many woodpeckers and certain species of psittacines.[1] Among the psittacine species that do not possess a uropygial gland are the hyacinth macaw, *Anodorhynchus hyacinthinus* , the Lear's macaw, *Anodorhynchus leari,* and the Spix's macaw, *Cyanopsitta spixii.* All of the parrots in the genus *Amazona* also do not posses a uropygial gland. The gland is present in the other psittacine species. The gland is also present in canaries and most finches.

The uropygial gland, when present, lies on the mid-line dorsally on the trunk in the rump area above the levator muscles of the pygostyle. In domestic fowl, the gland is drained by a pair of ducts. Each duct drains one lobe and each duct opens into a single, narrow nipple-like papilla. Other species have up to eighteen orifices.[1] There are no feathers normally on the skin over the gland. There is, however, a tuft of down feathers at the tip of the papilla in most species, and this is called the uropygial wick. In many species of bird, the tail usually flexes laterally each time the bird reaches around to contact the gland and the wick.[2]

The gland secretion is complex and consists of a combination of extruded cells, ester waxes, fatty acids, fat and sudanophilic secretory granules.[1,2] The secretion is spread over the feathers during the act of preening. Waterproofing is considered to be one function of the secretion (although it is not necessary for it), and another function is the suppression of the growth of organisms on the skin. The secretion helps keep the feathers, beak, and scales supple. The secretion is odorous in the female and nestling hoopoe, and in the musk duck and petrels.[1]

The secretion from the uropygial gland also contains vitamin D precursors that are also spread over the feathers by preening. With exposure to the ultraviolet portion of sunlight, the secretions are converted to an active form, vitamin D_3, which is then ingested with subsequent preening.[3]

New research shows that the bird eye sees light in the ultraviolet range, and the secretion from the uropygial gland may also play a role in the identification of the sex of a bird, and may be involved with individual identification of birds, as well.[4] In primates, the lens acts as a yellow filter which cuts off light of wavelengths below 400nm and therefore renders ultraviolet radiation invisible. However in diurnal birds, the cornea and lens are optically clear and appear to transmit wavelengths down to about 350nm, thus rendering near ultraviolet radiation visible.[1] The lens only absorbs those ultraviolet wavelengths that are not physiologically destructive.[1]

Examination

It is very important that the avian practitioner visually examine the uropygial gland in all birds where present. The gland has a

size and shape variation from species to species. For example, the uropygial gland is raised and somewhat heart-shaped in the African grey parrot, *Psittacus erithacus erithacus,* and in comparison to that of other species, such as the eclectus parrot, *Eclectus roratus,* it may appear enlarged by comparison. However, the uropygial gland is just a larger gland in the grey, which is a normal species variation. This author has performed many second opinions concerning the uropygial gland of greys, which were thought to be enlarged, impacted, infected, or abnormal, but in actuality, the gland was normal for a grey. Another species with a prominent uropygial gland is the Moluccan cockatoo, Cacatua moluccensis.

Abnormalities of the Uropygial Gland

The most common abnormality of the uropygial gland occurs from vitamin A deficiency.[5] This may cause glandular metaplasia and hyperkeratosis. Birds on poor diets are likely to be vitamin A deficient, and in addition to blunting of the choanal papillae that is commonly seen with hypovitaminosis A, enlargement of the uropygial gland is a likely sequela, as well. Although there are common references in the avian literature concerning impaction of the uropygial gland, in this author's practice, this is very rarely observed. The gland normally appears somewhat swollen, which may be mistaken for disease. With hypovitaminosis A, a hyperkeratotic plug may form in the gland, which may be dislodged by gently massaging or milking the gland after moist hot compresses have been applied. Correction of the diet and perhaps an injection of parenteral vitamin A, will usually rectify the problem.[3]

Neoplasia of the uropygial gland may occur. Adenomas, squamous cell carcinomas, papillomas, and adenocarcinomas have all been reported.[3,5] Neoplasms may have variable appearances, may be unilateral or bilateral, and they may superficially ulcerate.[5]

Infection may also occur in the uropygial gland. This may be secondary to hypovitaminosis A, immunosuppressive disease, such as that which occurs with Psittacine Beak and Feather Disease (PBFD), or trauma. However, in this author's experience, infectious adenitis is a rare occurrence. Bacterial or fungal adenitis does not often occur, and when it does, it is usually in PBFD positive birds. Infected glands may abscess.

Another condition of the uropygial gland has been observed by this author, but has not been described in the avian literature. Two obese cockatiels presented with the primary complaint of staining and a greasy appearance over the area of the uropygial gland and retrices. Examination of the gland showed swelling and upon massage of the gland, an excessive amount of the oily gland secretion leaked out through the wick. Both of these cockatiels were hens, very obese, on poor all-seed diets, and color mutations. Both birds responded to a weight loss program, dietary changes, and increased exercise. Once the hens reduced their weights to the normal range, the uropygial glands ceased producing excessive secretions.

Rupture of the uropygial gland has been reported in gentoo penguins and in free-living seabirds in Europe.[3]

Chronic dermatitis of the skin over and surrounding the uropygial gland may occur and may respond to appropriate medical therapy based on the cause.[5]

Diagnostic Methods

Diagnosis of disease of the uropygial gland will require taking a thorough history of the bird and evaluation of the diet. Cytologic examination of the gland secretion may be diagnostic. This can be performed by gently massaging or milking the gland and touching a glass slide to the wick to collect material. The secretion may be cultured for both aerobic and anaerobic bacteria. The gland can be biopsied or an aspiration may be performed and submitted for histopathology.[3]

Treatment

Treatment of disease of the uropygial gland will depend on the diagnosis. Most abnormal glands will be the result of hypovitaminosis A, and may be secondarily infected. These cases will respond to parenteral supplementation of vitamin A, correcting the diet, and hot-packing the area with moist heat in cooperative patients. Based on culture and sensitivity results, systemic antibiotic or antifungal therapy may be beneficial.[3,5]

Suspected tumors may require surgical excision. Surgical excision should also be considered when conservative medical management has not been effective, if impaction recurs, there is chronic, non-responsive infection, or if the gland has

ruptured. If possible, it is best to excise the gland before it ruptures, as the resulting inflammation, cellulitis, scar tissue, or septicemia may prove debilitating or life threatening.[3] Surgery should be considered as a last resort for conditions that can be managed medically, and should not be attempted for hyperkeratotic glands. In most birds, other than ducks, surgical removal of the uropygial gland does not appear to clinically affect the bird, however, in ducks, the glands excision will result in the duck losing its ability to waterproof the feathers.[3]

Surgical Procedure

Surgical excision of the uropygial gland should be performed under general anesthesia and with radiosurgery to maintain hemostasis and minimize damage to the retrices. A fusiform incision is made over the gland extending beyond the papillae. The gland is bilobed, and each lobe receives its blood supply from three blood vessels. The gland may attach to the deep areolar fascia over the synsacrum and caudally to the insertion point of the retrices. Care must be taken to avoid the blood supply to the retrices. The gland is bluntly dissected, and the blood vessels are identified and coagulated. The gland is gently dissected until it can be removed. The fascia should be closed with monofilament absorbable suture in a pattern to reduce tension to the skin. The skin is closed with a simple interrupted pattern.[6,7] Absolute hemostasis must be maintained during surgery, or seeping of blood may occur post-operatively, once the bird recovers from the anesthesia and the blood pressure returns to normal. This may result in large hematoma formation and may be involved in dehiscence.

If the gland has ruptured, or if it is severely chronically infected, extensive debridement may preclude total skin closure, and the wound may need to heal by second intention. Dehiscence and damage to the retrices may occur in these cases.[6,7] A drain may be placed ventral to an infected, ruptured gland, and it may remain in place for three days. Some birds may require a collar to prevent post-surgical plucking, removal of sutures or drain.

Conclusions

The uropygial gland should be evaluated in every bird that has one. Observing the gland in many birds will give the practitioner a good idea of what they should normally look like, so that it will be easier to identify an abnormal one. Most problems with the uropygial gland are related to hypovitaminosis A and most respond well to medical therapy, including the application of moist heat, massage and appropriate therapeutics. Tumors, abscesses, and ulcers may require surgical intervention, and if at all possible, the gland should be surgically excised prior to its rupture. This gland produces secretions with several known functions, and as we learn more about birds, I suspect that we will find other functions, as well. More research needs to be performed concerning the anatomy and physiology of this gland so that we may better understand its structure and function.

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