The Bald Bird:
Diagnosing and Treating Feather Destructive Parrots

Tracey Ritzman, DVM, DABVP
Cascade Hospital for Animals
Grand Rapids, MI

Feather destructive disorder is a common clinical entity in the avian patient. Skin and feather abnormalities can be the result of either a medical etiology, such as primary skin disease, or behavioral, or a combination of both. Obtaining a definitive diagnosis of the avian patient with feather and skin lesions can be challenging and frustrating to the clinician and client. This paper describes the diagnostic benefit of using paired full-thickness skin and feather follicle biopsies with histopathology as an aid in the diagnosis of avian skin disease.

The detailed cellular information obtained from histopathology of full-thickness skin and feather follicle biopsies increases the potential for a definitive diagnosis in the avian patient with feather destructive disorder. Ancillary diagnostic tests such as gross examination of feathers and skin, hematology, and bacterial and/or fungal cultures often do not provide an exact diagnosis of the disorder. Histopathology, however, is a valuable and often underutilized diagnostic tool available to the veterinary clinician. Although not all avian patients with feather or skin abnormalities can be definitively diagnosed, the help of a pathologist familiar with avian anatomy and histopathology will most certainly increase the potential for diagnosis. Clients are often unaware of the diagnostic benefit of biopsies for their clinical birds. Most are receptive to consideration of this test when presented with the diagnostic potential. This author uses paired, full-thickness skin and feather follicle biopsies, whenever possible, to aid in the diagnosis of the feather destructive patient. The purpose of this presentation is to present a diagnostic plan with an emphasis on paired, full-thickness skin biopsies. Case examples of skin and feather follicle biopsies submitted from the author's practice are also presented.

When presented with an avian patient with a history of feather destructive behavior or skin abnormalities, it is important to obtain a thorough history. The anamnesis is the crucial baseline information and "window" into this patient's home environment and health. When meeting with clients for the first time regarding their bird's problem, this author discusses the need for a thorough medical evaluation prior to exploring whether a behavioral component exists. Assuming or pursuing a presumed psychogenic diagnosis without a medical evaluation may not identify the primary underlying disease or disorder. Identifying and treating any existing medical problem will increase the likelihood of success in managing the patient's overall condition. Ideally any avian patient with feather or skin destructive behavior should also have an environmental and behavioral evaluation as well. Most behaviorists will inquire about the medical status of a patient when participating in the behavioral diagnosis of the bird. Not all clients are able or willing to pursue both, depending on time and resources available. If diagnostic capabilities are limited, paired skin biopsies would be recommended as a priority procedure.

Diagnostic guidelines

The following diagnostic evaluation will give the clinician a good assessment of the patient's condition leading up to the preferred diagnostic of the paired skin and feather follicle biopsies. Actual tests performed will depend on the physical examination findings and client compliance with recommended testing. Diagnostic tests for the feather/skin destructive patient include: hematology (complete blood cell count, chemistry profile, protein electrophoresis, bile acids, heavy metal screening), infectious disease screening if indicated (circovirus, bornavirus, polyomavirus, *Chlamydophila psittaci*, aspergillus, mycobacterium, candida), bacterial and/or fungal culture and sensitivity testing, impression cytology of the skin, fecal examination for parasite evaluation and gram stain testing, and /or radiography (may be applicable in some patients if internal disease/organ dysfunction is of concern).

Paired full-thickness skin and feather follicle biopsies

The importance of having paired samples from unaffected as well as affected skin and feather follicles should be emphasized and explained to the clients. Examination of only the affected area provides information related to the pathologic changes associated with that site, but potentially not the underlying etiology of the self-inflicted injury. Cellular changes associated with inflammation, trauma and/or secondary infections are often present once the patient has begun picking/mutilating the site. A full-thickness skin biopsy from an unaffected site (ideally an inaccessible area) is recommended in addition to samples collected from affected areas. An ideal location for the "unaffected site" in most birds is the back of the neck or head where the patient is unable to reach. This author prefers the back of the neck region, as this area tends to have less tension of the dermis than the skin overlying the cranium. The most common sites for affected areas include the pectoral area, medial wings and legs.

Biopsy procedure

Skin biopsy collection in the avian patient is a relatively brief procedure. Pre-anesthesia blood work screening is recommended for the patient prior to the procedure. This provides the clinician with an assessment of internal organ function and the patient's

appropriateness for anesthesia. Isoflurane™ or Sevoflurane™ anesthesia is utilized. Paired, full-thickness skin and feather follicle biopsies are collected using a scalpel blade rather than radiosurgery. Although radiosurgery can be used, there is potential for cellular changes to occur associated with this modality. Punch biopsy instruments, although utilized frequently in mammals, are less practical for use in birds due to their relatively thin dermis compared to mammals. The selected biopsy sites are minimally prepped in order to avoid artifact or removal of evidence. Feathers surrounding the surgical areas are not plucked or removed and use of topical antibacterial scrub should be minimized. Sterile saline works well to gently prepare the areas if there is gross contamination.

Several growing immature feather are sampled with the full-thickness section of skin. At least one entire feather follicle should be included as well. The average size for most biopsies would be in the range of 4-10 mm, depending on the size of the patient. Closure of the skin defect after biopsy can be performed using one or several simple interrupted sutures or surgical tissue adhesive. Hemorrhage, if any, tends to be minimal and can be controlled with direct pressure. The author prefers using 5-0 absorbable, monofilament suture in a simple interrupted or continuous pattern for closure. If bacterial and/or fungal culture is desired, samples can be collected at the time of biopsy from the biopsy sample or biopsy site.

Interestingly most patients postoperatively will not bother the biopsy sites due to the small incision size. Some patients do require a temporary neck collar to prevent access to the sites during healing. Perioperative analgesia can be provided with an injectable analgesic such as buprenorphine HCl (0.01-0.05 mg/kg, IM, IV or SQ) or butorphanol tartrate (1- 4 mg/kg, IM, IV or PO). Additional anti-inflammatory therapy can be provided at home using an avian appropriate non-steroidal anti-inflammatory such as meloxicam (0.1- 0.5 mg/kg, PO or IM). Antibiotic and/or anti-fungal therapy may be prescribed, if indicated, while culture and sensitivity results are pending. Biopsy samples should be clearly labeled “affected, with exact location” and “unaffected, with exact location” in separate tissue cassettes and placed in 10% neutral buffered formalin. The pathologist evaluating the samples should have a familiarity with avian cutaneous microanatomy and pathology.

Discussion

The utilization of full-thickness skin and feather follicle biopsies as an aid in the diagnosis of skin disease in psittacines is described in the literature. Clubb SL et all presented the concept of using paired skin biopsy samples in the diagnosis of inflammatory skin disease in psittacines in 2002. The paired biopsy protocol was created to aid in the determination of the possible etiologies of dermatological problems in the avian patient. Use of paired biopsy samples with histopathology has been crucial in determining the actual disease process by including unaffected biopsy sites. A recent, comprehensive study utilized the paired biopsy samples, as the authors felt that biopsy of a traumatized site alone would not provide adequate information for determining if underlying inflammatory disease existed.

There has been a fair amount of discussion in the past by clinicians as to whether primary inflammatory skin disease is a true clinical condition in the avian patient. Current data supports the existence of primary inflammatory skin disease in psittacines. A recent publication by Garner MM, Clubb SL et al entitled “Feather picking psittacines: histopathology and species trends” describes in detail the diagnostic technique and findings in 408 feather picking or self mutilating psittacines using the paired skin biopsy technique. In that study inflammatory skin disease (51.5% of cases) and traumatic skin disease (48.5% cases) were defined as distinct disease entities in feather picking or self mutilating psittacines. Species trends were noted for each condition with cockatoos and African grey parrots significantly more likely to have trauma-induced skin disease, while the macaws, amazons and lorikeets were significantly more likely to have inflammatory skin disease. This study indicates that inflammatory skin disease may be prevalent in birds with feather destructive behavior and the findings were suggestive of cutaneous delayed type hypersensitivity. The presence of marked perivascular inflammation in the superficial or deep dermis was criteria used for the diagnosis of inflammatory skin disease. Lymphocytes with fewer plasma cells, histiocytes, and eosinophilic granulocytes were the inflammatory cells usually associated with the inflammatory lesions.

In patients with traumatic skin disease the etiology may not be determined and often is presumed to be behavioral. In patients with negative (unremarkable) findings in the unaffected biopsy sample, the possibility of a psychogenic component to the traumatic skin disease exists. Having a definitive determination of psychogenic etiology can be difficult to obtain. The author of this presentation has diagnosed inflammatory skin disease and traumatic skin disease as the two most prominent clinical diagnoses utilizing the paired biopsy technique.

Treatment options

The recommended treatment plan for a patient will be based on the physical examination, diagnostic findings and the personal ability of the owner in terms of treatment. Giving parrots medications can certainly be challenging. The route of medication recommended will depend on whether the owner can handle the bird and their personal skill and comfort level. In hospital therapy can potentially be provided via parenteral route. At home treatment will usually involve the administration of oral medication, if needed.

For parrots diagnosed with primary skin disease or feather disorder based on histopathology, medications may help reduce symptoms and may have the potential to treat the underlying condition. Birds with primary skin inflammation will often benefit from medications that help to reduce inflammation, pruritis and anxiety. Avian patients with primary skin inflammation often respond to

anti-inflammatory therapy. Meloxicam (Metacam™, Boehringer Ingelheim Vetmedica, St. Joseph, MO, USA) is a non-steroidal anti-inflammatory, which has dosing information from pharmacokinetic research in psittacines. Steroids should be avoided in the avian patient (with the exception of certain traumatic conditions) due to the risk of side effects. Steroids have the potential to cause immunosuppression in birds, which can predispose to potential opportunistic infection such as aspergillosis. Other classes of medications used to treat feather destructive condition include anti-histamines, anxiolytics, tranquilizers, or opioid antagonists. Unfortunately the safety, dosing, efficacy and pharmacologic effects of these medications are poorly understood in birds. The utilization of these drugs as a sole therapy is unlikely to resolve feather destructive behavior in the avian patient. Caution is recommended when using medications with unknown dosing and pharmacokinetics.

Environmental enrichment and the introduction of foraging behavior to the avian patient with feather destructive behavior is an important component of therapy. Many pet birds lack the diversity of activities and stimulation of their wild counterparts. By introducing play and foraging activities to pet birds their quality of life and health is often greatly improved. Patient with a behavioral basis to their feather destructive behavior often respond to foraging and enrichment changes.

For birds that are prone to self-inflicted skin or muscle wounds, the use of a neck collar to prevent access to that area of the body may be required. Although the author prefers to avoid the use of neck collars when possible, there are patients that have the potential to cause self harm in which the collar may be necessary. As with any treatment, the risks of the use of the collar should be weighed against the potential benefits to the patient.

In conclusion, clinicians are highly encouraged to utilize paired skin and feather follicle biopsies in their avian patients with dermal disease. This diagnostic tool can yield the most definitive information in regards to potential etiology. Histopathology of paired samples from clinically affected and unaffected sites will provide the pathologist with optimal information. This gives the clinician and clients the best opportunity to understand and better define the patient condition leading to feather or skin destructive behavior.

References

Welle KR. Clinical approach to feather picking. Proc Annu Conf Assoc Avian Vet.. 1999; 119-124.

Gill JH. Avian Skin Diseases. Vet Clin North Am Exotic Anim Pract, Vol 4, No 2, pp. 463-492, May 2001.

Schmidt RE, Lightfoot TL. 2006. Integument. In: Clinical Avian Medicine, Vol 1: ed. Harrison GJ, Lightfoot TL. pp 395-410. Spix Publishing, Palm Beach, FL. 2006.

Schmidt R: Use of biopsies in the differential diagnosis of feather picking and avian skin disease. Proc Annu Conf Assoc Avian Vet. 1993; 113-118.

Clubb SL, Garner MM, Cray C: Detection of inflammatory skin disease in psittacine birds using paired skin biopsies. Proc Annu Conf Assoc Avian Vet. 2002; 193-199.

Clubb SL, Garner MM, Cray C, Arheart K, Goodman M: Diagnostic assessment of feather damaging behavior in African grey parrots (Psittacus erithacus). Proc Annu Conf Assoc Avian Vet. 2004; 313-320.

Garner MM, Clubb SL, Mitchell MA, Brown L. Feather picking psittacines: histopathology and species trends. Vet Path. 2008. In Press.

Garner MM: Avian noninfectious skin disorders. Proc Annu Conf Assoc Avian Vet. 2003; 21-23.

Rosenthal KL, Morris DO, Maudlin EA, Ivey ES, Peikes H: Cytologic, histologic and microbiologic characterization of the feather pulp and follicles of feather-picking psittacine birds: A preliminary study. J Av Med Surg. 2004;18: 137-143.

Lucas AM, Stettenheim PR: Avian Anatomy. Integument. Agricultural handbook 362, pp 485-635. US Department of Agriculture, Washington D C, 1972.