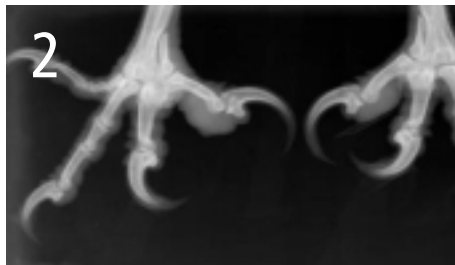


make your diagnosis

Pain in a Bird's Foot

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History. An adult, female bald eagle (*Haliaeetus leucocephalus*) was presented to the Wildlife Hospital with a 3-day history of lethargy and anorexia. The bird had been found 2 months earlier entangled in a barbed-wire fence. A local wildlife rehabilitator was contacted immediately. The bird was treated for minor abrasions around the neck, wing, and plantar surface of the foot with a first-generation cephalosporin antibiotic for 2 weeks. It recovered uneventfully and was transferred to a rehabilitation facility where it was placed in a flight cage in which the perches were covered with thick ropes. The rehabilitator noticed that the eagle was often impaired when walking and grasping after it was placed in a flight cage. He was also concerned that the perches were not the appropriate size and shape.

Physical Examination. The raptor weighed 4 kg and had a body condition of 2/5. It was weak and depressed. A hyperkeratinized ulcerative lesion (**Figure 1**) on the plantar surface of the hallux was noticed. Further evaluation revealed cellulitis with thickening of the digital pads, which led to the swelling and abscesses of the affected area. Heart and respiratory rates were normal.

Diagnostics. A complete diagnostic work-up was done, including CBC, plasma biochemistry panel, culture and sensitivity testing, and survey radiographs (**Figure 2**). Significant laboratory results are listed in the **Table**.

continues

Diagnostic Testing

Variable	Result	Reference Range
CBC		
Packed cell volume (%)	35	35–45
White blood cells (10 ³ /μl)	20.7*	5000–15,000
Heterophils (10 ³ /μl)	17.4*	8000–12,000
Lymphocytes (10 ³ /μl)	1.2*	2000–4000
Monocytes (10 ³ /μl)	2.1*	500–800
Morphologic cell characteristics	Normal	
Plasma chemistry analysis		
Aspartate transaminase (IU/L)	987*	153–370
Creatine kinase (IU/L)	1159*	250–650
Culture and sensitivity	<i>Staphylococcus aureus</i> (coagulase-positive) and <i>Escherichia coli</i>	

*Abnormal values.

ASK YOURSELF . . .

- What problems are identified from the history, physical examination, and diagnostic testing?
- Which avian species are affected?
- What environmental conditions contribute to the disorder?

PODODERMATITIS . DIAGNOSTIC REPORT

Diagnosis: Pododermatitis

Pododermatitis, also known as bumblefoot, is a broad term used to describe an inflammatory condition of a bird's foot. It is a common cause of lameness in captive raptors, waterfowls, and psittacines. The disorder is linked to poor circulation of blood to the feet, which devitalizes tissue and reduces its ability to respond to infection and to heal. Birds of prey usually develop pododermatitis as a result of management-related problems. Clinical signs of abnormalities of the feet include swelling, erythema, ulceration, thickening, constrictions, masses, and other proliferative lesions.

Common predisposing factors of foot lesions include bacterial infection, malnutrition, nutritional deficiencies, soiled or wet bedding, abrasions from flooring, sedentary behavior caused by excessive weight, and small cages that restrict movement. Other factors in captive raptors include surgery or injury to the contralateral limb, causing excessive weight bearing on the affected foot. Pododermatitis has also been diagnosed secondary to puncture wounds involving the plantar foot surface due to overgrown talons and trauma.

Pododermatitis is usually classified as having three stages, as described by Redig, Cooper, and Remple. Stage 1 is mild disease, stage 2 is more extensive disease, and stage 3 is very severe disease that may not respond to treatment. This bird was considered to have stage 2 disease resulting from inappropriate use of perches. The anorexia, lethargy, and weakness coupled with impairment in walking were attributed to the chronic inflammatory process as seen on the CBC. At the same time, aspartate transaminase and creatine kinase were elevated due to muscle necrosis from the ulcerative and devitalized tissue in the affected area.

Microbiological analyses were obtained from wound exudates before surgery. Isolation of *Escherichia coli* most likely was associated with

DID YOU ANSWER...

- **History and physical examination:** Lethargy, anorexia, impairment with walking, fair body condition, depression/weakness, and ulcerative lesion on the hallux

Diagnostic testing:

Plasma chemistry analysis: elevated aspartate transaminase and creatine kinase

CBC: chronic inflammation

Cultures: *Staphylococcus aureus* (coagulase positive) and *Escherichia coli*

Radiographs: Bilateral soft tissue swelling without evidence of osteomyelitis around the hallux

- In pet birds, pododermatitis is most commonly seen in inactive and obese psittacines, particularly budgerigars, cockatiels, Amazon parrots, African grey parrots, and cockatoos.
- It often occurs in birds that have inadequate perches and/or are maintained on an improper diet. Inappropriate perches should be removed and replaced with fresh, large, bark-covered natural branches of various sizes and shapes. Large round or flat perches covered with plastic lawn (Astro-turf) or thick ropes are ideal for raptors but not psittacine species.

fecal contamination and was considered an opportunistic pathogen. In early cases of pododermatitis, *Staphylococcus* species are often isolated from the lesion and coagulase-positive *S. aureus* is the most common initiating bacterium.

Treatment. Treatment varies with severity.

Severe cases with necrosis, abscess, and swelling require intensive treatment.

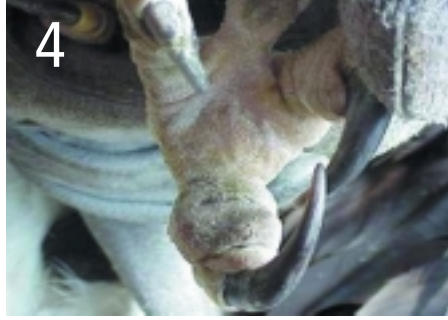
Radiographs are important in evaluating for osteomyelitis. If osteomyelitis is present, prognosis is poor.

One conservative medical treatment involves a combination of long-term antibiotics (based on culture and sensitivity testing) and a topical combination of 1.4 g dimethylsulfoxide (DMSO), 2 mg steroids (dexamethasone sodium phosphate), and 25 mg amikacin. Although corticosteroids are controversial in birds because of their immunosuppressive effect, we have used this topical drug combination for treating cellulitis and inflammation associated with pododermatitis for 14 years with few if any side effects (as measured by complete blood count, plasma biochemistry, and clinical secondary infection). Although we do not treat all pododermatitis lesions with this medication, nor is it effective in 100% of cases, we have found it to be a viable treatment option for moderate to severe pododermatitis lesions and it does not appear to cause the side effects described with long-term systemic corticosteroids or commercial corticosteroid creams.

Lavage therapy is recommended for pododermatitis classified as stage 2 and higher (see **Tx at a Glance**). Correcting dietary deficiencies in vitamin A helps reduce the likelihood of recurrence. In very severe cases, surgical treatment requires removal of all devitalized tissue; culture and sensitivity testing should also be done. The wound should be lavaged and the defect packed with gauze soaked in warm 0.9% saline, 2% chlorhexidine, or iodine solution. The surface of the foot should be dried in preparation for a ball bandage. A rolled piece of strip gauze or 4 x 4 gauze sponge in the form of a ball is placed into the clinched talon of the patient. The gauze ball must have enough surface area for the bird to support its weight on the bandage, which is secured in place with self-adhesive tape. The ball bandage should be changed daily to facilitate the treatment of the wound or when it



Drain and sutures placed to obliterate dead space and to appose skin edges



Wound appearance 3 weeks after presentation. Notice the suture line around the hallux. The condition is in complete remission.

becomes soiled. Raptors, waterfowls, and psittacines generally tolerate these bandages very well. Once the defect is healed, a delayed primary closure may be done and the ball bandage removed.

An overriding goal of treatment is to increase the blood supply to the affected area. Successful treatment of pododermatitis includes wound management and removal of the underlying causes.

For this case, we elected to surgically remove all abnormal tissue 72 hours after presentation to allow reconstruction of a more normal plantar aspect of the foot. After devitalizing the tissue by excision and debridement, we closed the ulcerative lesion with 4-0 polydioxanone suture in a simple interrupted pattern. Suture size was chosen to prevent further damage to the digital pad. At the same time, braided umbilical tape was used to facilitate drainage of the affected area with dilute chlorhexidine as a lavage solution (Redig PT. Personal communication; 2003). Wet-to-dry bandages were incorporated in a ball bandage and applied every 3 days to minimize stress. After sensitivity results, 15 mg/kg enrofloxacin was administered orally once daily for 2 weeks. Pain management was provided with an oral carprofen suspension, 2 mg/kg Q 12 H, compounded by Louisiana State

University School of Veterinary Medicine Pharmacy. Three weeks after surgery, the condition was in complete remission (Figures 3 and 4). ■

See Aids & Resources, back page, for references, contacts, and appendices.

Tx at a glance. . .

Moderate to severe disease

- **Medical treatment: Long-term antibiotics (PO, based on culture and sensitivity testing) and topical combination (1.4 g DMSO / 2 mg dexamethasone / 25 mg amikacin)**
- **Lavage therapy: Soak feet (warm 0.9% saline, 2% chlorhexidine, or povidone-iodine for 15 to 20 min Q 24 H)**

Very severe cases

- **Surgery: Remove all devitalized tissue, followed by lavage and packing with gauze soaked in warm solution (see above). Apply ball bandages sufficient to support bird's weight (see text) and change daily. Upon healing, delayed primary closure may be done and bandages removed.**

compassionate utilization of contemporary science, selection of clinical teams to provide optimal care, and dedication to the welfare of patients.

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