Birds of prey: what you should know

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exotic encounters

BIRDS of prey, or raptors, include orders such as Strigiformes (owls) and Falconiformes (vultures, eagles, hawks and falcons), which are commonly kept and encountered in veterinary practices, or seen as wildlife casualties in the UK.

Whether kept as a hobby to hunt quarry, or used for pest control, these species should generally show high fitness levels (Longley, 2006). However, this also predisposes these birds to specific ailments.

The most common of these are discussed in this article. For further information on species classifications and characteristics, refer to the literature (Cooper, 2008).

Some species of raptors (for example, goshawks and ospreys) kept in the UK are listed under Section 7 and Schedule 4 of the Wildlife and Countryside Act (1981), and owners should be aware of the requirements necessary to keep them (www.defra.gov.uk for more information).

Relevant terminology

It is important for vets to acknowledge the terminology used by many owners as terms used for
other companion birds may not be recognised and could lead to owners doubting the clinician’s understanding of the species (Table 1).

Natural behaviour and husbandry

Birds of prey are primarily hunters, but are nonetheless vulnerable and will act defensively, fearfully and will often hide obvious clinical signs until conditions have advanced. Husbandry equipment and practices depend on the species and falconer preferences. Certain species will require particular shaped perches, such as a block perch (Figure 1) for falcons or a bow perch (Figure 2) for other hawks (Parry-Jones, 2008). Artificial grass can be used on the perch to reduce the onset of pododermatitis by spreading the pressure on the feet from its bodyweight.

Raptors are routinely fed whole carcases of small birds and mammals and tend to get their water from their food. Regurgitation of food parts (castings) is an important part of the digestive cycle as the gastrointestinal tract does not facilitate breaking down tough materials such as fur, feathers and bones (Figure 3). These indigestible items are compacted and regurgitated in a stomach-shaped parcel 12 to 18 hours after feeding.

Hospitalisation

The hospital enclosure should be in a quiet area away from other birds and predatory-type species, and monitored for temperature (26°C to 30°C) and humidity (70 per cent). Ideally, birds should be kept in different air spaces or with their own air ventilation system (Longley, 2008). Some birds of prey will become calmer and stay on the perch when a hood is worn (Figure 4). It is advisable for a practice to be able to provide at least a bow or a block perch, falconer’s glove, various sized hoods and frozen one-day-old chicks, mice and/or quail from a reputable source. The authors advise tethering patients to the appropriate perch to prevent sudden escape attempts.

Most species commonly seen in practice have long tail feathers that should be protected by a tail guard (radiographic film or cardboard secured with tape) while hospitalised to prevent damage that could affect the bird’s flight until the next moult (Figure 5). Placement must not obstruct the cloaca. All inpatients should be weighed daily to check for adequate food maintenance – either by scales fitted with a perch for calm birds or by gently wrapping the bird in a towel and placing it on its back.

Handling

The majority of raptors seen in practice will be trained to sit on a gloved hand and be calm during examination; however, for a thorough examination, most will need to be “cast” in a towel. Great care must be taken to control their feet as their sharp talons and strong grabbing reflex can inflict serious injury (Figure 6). When encouraging the bird to step up on to the glove, the rope (leash) that is attached to the leg anklet and straps (jessies) should be held tight through the gloved hand. Birds
of prey prefer to be positioned high, and once the bird’s feet are placed, the gloved hand should be held up to shoulder height to avoid the bird walking up to the handler’s unprotected shoulder or head.

**Veterinary care**

**Gastrointestinal system**

**The crop**

The crop is a diverticulum of the oesophagus that provides an initial (approximately six hours) holding chamber for food material before entering the first stomach (proventriculus). Unlike most other birds, owls have no crop and the food passes straight into the foregut.

Sour crop is a condition characterised by ulceration and inflammation, which occurs in the crop from food items not passing through and becoming putrefied due to their warm body temperature (41°C; Kubiak and Forbes, 2011a; Lloyd, 2008). This condition can be life-threatening, therefore the food material should be surgically removed and the bird administered a broad-spectrum antibiotic as well as fluid and nutritional therapy.

**Enteritis**

Enteritis may be viral, fungal, parasitic, toxic and, most commonly, bacterial (usually from bacteria growth in food) and characterised by a variety of clinical signs, such as abnormal mutes (faeces), regurgitation, altered appetite, and anorexia (Lloyd, 2008; Brandao and Beaufrère, 2013). *Capillaria* species is an ascarid parasite found in the upper gastrointestinal tract of raptors and usually shown as white plaques on the oropharynx. Regurgitation and head flicks may be seen (Kubiak and Forbes, 2011a).

**Lead toxicosis**

Lead toxicosis may be seen in captive or wild raptors after ingestion of shot quarry. Lead contained in the shot may be absorbed, disseminated systemically and may eventually affect the central and peripheral nervous system.

Anaemia and/or gastrointestinal disturbances may also be seen. Radiographs may not show radiodense particles in the proventriculus or gizzard if the bird has already cast up the indigestible part of its meal – including the metal particles. Blood lead essays are diagnostic, but chelation therapy may be started before results are available if there is a strong suspicion of intoxication.

**Respiratory system**
The most common cause of respiratory disease is aspergillosis caused by *Aspergillus* species (usually *A. fumigatus*). This fungal infection becomes evident in immunosuppressed and/or stressed individuals affected by other diseases or long-term antibiotic treatment (Longley, 2008). Antifungals, such as itraconazole, are commonly used in these cases and nebulisation can be helpful (Figure 7), although the more expensive voriconazole is thought to be the most effective treatment (Kubiak and Forbes, 2011a). Ensuring good husbandry, including well ventilated areas, can help prevent this disease from occurring.

**Musculoskeletal system**

**Tibiotarsal fracture**

Tibiotarsal fractures are among the most common orthopedic injuries seen in captive raptors (Figures 8 and 9). They generally occur when a bird, unaccustomed to tethering, bates from the perch, but is stopped in mid-air by the leash (Kubiak and Forbes, 2011b). A tie-in hybrid fixator is considered the treatment of choice for surgical repair of these fractures with the aim of a return to full functional capacity of the leg (Hatt, 2008). A short leash and the use of a block perch for initial tethering may reduce the likelihood of these fractures.

**Bumblefoot**

Bumblefoot is a feature of captivity, but not a recognised condition in free-living birds (Figure 10). It is more often seen in falcons, but may occur in owls and eagles, and is rare in hawks and other species. Improper management leading to pressure necrosis of the plantar aspect of the foot, penetration injuries or abrasions may all predispose to the development of this condition. *Staphylococcus* species, not a natural commensal of raptor foot skin, are commonly isolated in cases of bumblefoot (Kubiak and Forbes, 2011b).

Various stages of the condition are commonly seen, ranging from mild abrasion to ulcerative lesions or bony changes to the feet, and treatment may need to be aggressive.

**Wing tip oedema**

Species from warm climates may be more predisposed to wing tip oedema seasonal condition occurring during the winter months, but peregrines and species from temperate climates may be affected as well. Young birds up to one year old, tethered less than 45cm off the ground, are more predisposed, especially during freezing weather and cold nights. A drooped or abducted, swollen (pitting oedema) wing may be seen with cold and wet wing tips. If left untreated, dry gangrene may result with permanent loss of the wing tip and compromised flight ability.

For further discussion on anatomy, commonly seen conditions and relative treatments refer to O’Malley, 2005; Bailey and Lloyd, 2008; Hatt, 2008; Hirschberg, 2008; Kubiak and Forbes, 2011a; Kubiak and Forbes, 2011b.
Common techniques

A general anaesthetic is routinely performed and recommended for more invasive and lengthy diagnostic procedures such as radiography and coelioscopy.

Venipuncture

There are various options for venipuncture sites in birds of prey for blood collection. The right jugular, basilic/ulnar and metatarsal veins can be used (Figure 11). The ulnar vein and the medial metatarsal vein can also be used for IV catheter placement. Conscious blood sample collection from patients is possible if they do not become too stressed. Samples should be assessed manually as most diagnostic machines will not accommodate the nucleated red blood cells found in birds of prey (Kubiak and Forbes, 2011a). Intraosseous catheterisation can be routinely performed on anaesthetised or collapsed patients by using spinal needles (21G to 23G); however, it must be emphasised raptors have a pneumatised humerus and the distal ulna is therefore the recommended placement site.

Fluid therapy

Compound sodium lactate (Hartmann's solution) may be given at 10ml/kg/hr when providing maintenance during anaesthetics (preferably as constant rate infusion), or at 50ml/kg/day to 100ml/kg/day if given in IV boluses. Subcutaneous locations may alternatively be used, such as the inguinal regions (precrural fold), axilla, or over the dorsal region (Longley, 2008). Fluid boluses should be gently warmed to the bird's body temperature before administering, and adding hyaluronidase (1:1000) to the fluids can improve absorption.

Nutritional therapy

Supportive recovery formulas can be force fed directly into the crop – preferably by using a plastic or a blunt-ended metal tube plus either the handler's thumb and forefinger in the corners of the mouth or a metal speculum may be used for larger species to keep the beak opened.

Suitable convalescent foods include Oxbow Critical Care Formula Carnivore, Hills A/D, or Lafeber’s Emeraid Carnivore Critical Care System. A dose rate of 20ml/kg may be given up to six times daily (Kubiak and Forbes, 2011a). In dehydrated individuals, fluid therapy should be instituted and oral electrolyte preparations, such as Lectade or Vetark Professional Critical Care Formula, should be administered to rehydrate the bird prior to feeding (Longley, 2008).

Microchip implantation

It is highly recommended to microchip owned raptors as loss during exercise flight is common. The
British Veterinary Zoological Society recommends microchips to be placed in the left pectoral muscle (Chitty, 2008). This can be done on conscious birds and the authors recommend aseptically cleaning the site, administering a 8mm mini-chip (widely available) and applying a small amount of tissue glue to help seal the insertion site.

**Anaesthetic considerations**

Birds of prey should be fasted prior to administering an anaesthetic for up to 12 hours to ensure the crop is empty or a cast is being produced. Intubation is simplified because the glottis can be easily seen (Figure 12), thus an uncuffed endotracheal tube can be inserted and secured quickly (Figure 13). In recovery, the patient should be positioned upright to ensure any voluntary respiratory movements are not compromised. Supporting ventilation with a bag valve mask for intermittent positive pressure ventilation may be necessary (Figure 13). Most raptor patients will recover well and quickly perch, but some may require further support with a doughnut-shaped towel nest.

**Conclusion**

This article is aimed at offering some up-to-date resources on the basic considerations related to captive birds of prey encountered by the general practice. However, due to the extremely vast subject, the reader is referred to the literature for more in-depth information.

• Note voriconazole is not licensed for veterinary use.

**References and further reading**

Figure 1. A peregrine falcon (*Falco peregrinus*) using a block perch with artificial turf for the bird to stand on.
Figure 2. A Harris hawk (*Parabuteo unicinctus*) tethered to a bow perch in shelter.
Figure 3 (above). A regurgitated pellet or cast from a golden eagle (*Aquila chrysaetos*).
Figure 4. A gyr x saker falcon (Falco cherrug x F rusticolus) accustomed to handling can be kept calm during transportation by using a hood.
Figure 5. A radiographic film secured with tape is being applied as a tail guard to this Harris hawk (*Parabuteo unicinctus*) while it anaesthetised for bumblefoot radiographs and dressings.
Figure 6 (right). Secure restraint of an eagle owl (*Bubo bubo*) showing the casting technique in a towel.
Figure 7. A golden eagle with respiratory problems being nebulised with F10 disinfectant.
Figure 8. A dorsoventral radiograph showing a tibiotarsal fracture in a bird of prey.
Figure 9. Surgical repair of a tibiotarsal fracture in a bird of prey.
Figure 10. A severe case of bumblefoot in a peregrine falcon (*Falco peregrinus*).
Figure 11. Temporary placement of an IV catheter in the basilic vein of an anaesthetised Harris hawk (*Parabuteo unicinctus*).
Figure 12. A clear view of the glottis in an eagle owl (*Bubo bubo*).
**Figure 13.** A golden eagle being supported in an upright position and receiving IPPV using a bag valve mask while in recovery from an anaesthetic.
<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
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<tr>
<td>Bate, bating off</td>
<td>Excitable or panic attempts to fly off a perch while tethered</td>
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<td>Bewits</td>
<td>Leather strap used to attach a bell to the bird’s leg</td>
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| Cast, to cast, casting, cast off | (Verb). To regurgitate a pellet; to grab or hold a bird; indigestible portion of food          
                                      | (Noun). Two or more birds flown together                                                                                               |
| Cope                        | To trim the beak or talons                                                                                                             |
| Foot                        | (Verb). To use its feet to strike                                                                                                       |
| Hood                        | Leather cover for the head and eyes                                                                                                    |
| Jesses                      | Leather straps placed around the bird’s ankles                                                                                           |
| Lure                        | Dummy prey on a line used in training                                                                                                   |
| Mantle                      | (Verb). Using wings to create a barrier guarding food while the bird eats                                                              |
| Mutes                       | Faeces                                                                                                                                  |

Table 1. Commonly used terminology in falconry (adapted from Parry-Jones, 2008)