LEAD TOXICOSIS IN FALCONRY BIRDS

Lead is a soft blue grey metal widely used to produce a diverse range of commercial and industrial products. One of the most common uses is the manufacturing of pellets used for air rifles and shotguns as well as bullets for hunting rifles. Small pellets fired from air rifles may contain approximately 150 mg of lead while larger cup-type pellets may contain up to 600 mg of lead. A No. 6 cartridge from a shot gun may contain up to 280 individual pellets weighing on average 125 mg each.

Lead toxicosis commonly affects wild raptors feeding on moribund prey or carcasses of shot prey; however it can also be seen in captive raptors that are fed road kill or in cases where falconers use lead ammunition to harvest wild sources of food for captive birds (such as pigeons, doves, sparrows, or rodents). The falconer commonly assumes that lead pellets have penetrated and gone through the body of the prey that are offered to the raptor as food. Even if the pellet did pass through, lead is a very soft metal and small fragments often spread quite far from the actual bullet track. Over time, even these small amounts of exposure can accumulate in the raptor and become fatal. Following ingestion by the falconry bird, lead pellets begin dissolving slowly, through the chemical action of the gastric juices. Once absorbed, lead is transported through the blood stream and deposited into well-vascularized organs, such as the liver, kidneys, fatty tissue and bones.

Fig. 1. A blood sample is collected to measure the lead concentration in circulating blood.

Fig. 2. Radiographs are always recommended in the clinical diagnosis of lead toxicosis to look for the presence of radiodense pellets or fragments in the gastrointestinal tract.

Symptoms

The symptoms of lead toxicosis may become evident as early as 12 hours after ingestion of the lead shot. The clinical symptoms vary in severity depending on the amount of lead absorbed. Subtle clinical symptoms may include mild depression, intermittent regurgitation, reduced appetite, poor flying performance, bright green mutes, and progressive weight loss. Severe symptoms are commonly characterized by nervous system signs such as dropped wings, head and neck tilt, clenched talons/inability to stand, and seizures. Rapid death may occur in some extreme cases, or if treatment is not initiated promptly.

Diagnosis

The diagnosis of lead toxicosis is usually carried out by measuring the lead concentration in whole blood samples. Radiographs (x-rays) may show the presence of lead particles in the gastrointestinal tract; however many raptors will cast the visible portion of the lead in their pellet before clinical signs are noticed. The treatment is simple and usually very effective if the toxic agent has not produced irreversible damage. A chelating (binding) agent or antidote (for example, Calcium EDTA, DMSA and penicillamine) has to be administered daily, usually by injection (CaEDTA, penicillamine) though some medications can be given orally if appropriate (DMSA). Medications are given for as long as recommended by your avian veterinarian then repeat testing of blood lead concentration is performed; treatment is repeated as needed until the blood lead concentration has fallen below the toxic limit. Any remaining lead pellets present in the stomach can be removed by gastric lavage and/or retrieval using flexible or rigid endoscopes and long grasping forceps once the patient is stable. Supportive therapy (fluids, supported feeding if needed, +/-antibiotics) is also strongly indicated during the duration of the treatment. A recheck blood lead concentration is recommended 1-2 weeks post-treatment as some patients that have had chronic lead exposure may exhibit a “rebound” of elevated lead and require additional therapy. Research is still ongoing as to the long-lasting effects of lead toxicity.

Since lead toxicity is easier to prevent than to treat, please make sure that the food sources you provide for your falconry birds are free of lead. Use of lead ammunition is not recommended if you are hunting for wild sources of food for your birds.

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AAV: Setting a Standard in Avian Care Since 1980

Avian medicine is a distinct and very specialized field that requires extensive training, advanced skills, and facilities specifically designed and equipped to treat and hospitalize birds. The Association of Avian Veterinarians was established to provide veterinarians with this special education, and to keep them up to date with the latest information on bird health. The AAV holds an annual conference on avian medicine and publishes the peer-reviewed Journal of Avian Medicine and Surgery. AAV also makes annual contributions toward avian conservation and sponsors studies advancing the understanding of avian medicine.

For More Information

For more information on birds, ask your veterinarian for copies of the following AAV Client Education Brochures:

- Aspergillosis in Falconry Birds
- Avian Chlamydiosis and Psittacosis
- Avian Pox Infection in Falconry Birds
- Veterinary Care for Your Pet Bird*
- Basic Care for Companion Birds*
- Behavior: Normal and Abnormal
- Caring for Backyard Chickens
- Digital Scales
- Feather Loss
- Feeding Birds
- Injury Prevention and Emergency Care
- Managing Chronic Egg-laying in Your Pet Bird
- Signs of Illness in Companion Birds*
- Ultraviolet Lighting for Companion Birds
- When Should I Take My Bird to a Veterinarian?*
- Zoonotic Diseases in Backyard Poultry*

**Available in multiple languages. All others are available in English only at this time.*

Online Resources

Follow AAV on Facebook (**www.facebook.com/aavonline**) for great tips and the latest news for pet bird owners. You can also find us on Twitter (**@aavonline**) and YouTube!

Our website, **www.aav.org**, offers a Find-a-Vet tool to help pet bird owners locate avian veterinarians around the world. We also offer a variety of resources such as basic bird care instructions and more. Visit the website today!

The treatment of ill birds should always be carried out by a qualified veterinarian.

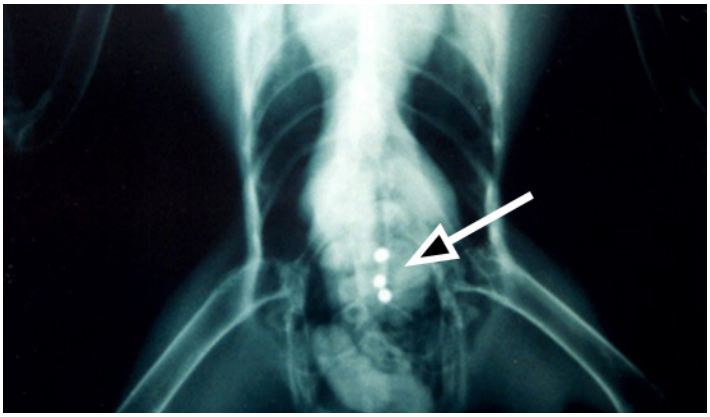

Fig. 3. Birds of prey commonly ingest lead pellets or lead fragments concealed in the body of shot prey. Detecting the presence of lead pellets or lead fragments through radiographs of the gastrointestinal tract, in particular the ventriculus, assists in the diagnosis of clinical lead toxicosis.

Fig. 4. If the presence of lead pellets or lead fragments in the ventriculus is detected, the bird is then prepared for the lead retrieval procedure. Lead pellets are commonly removed using a combination of gastric lavage and endoscopic-guided retrieval using long grasping forceps. For gastric lavage, a small wad of cotton is used to block the choana and avoid penetration of gastric fluid into the nasal cavity and infraorbital sinuses. The procedure is performed with the bird under general anesthesia.

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