Husbandry and Medicine of the sugar glider

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The recent increase in pet ownership of exotic small mammals did not pass on sugar gliders (*Petaurus Breviceps*). Pet stores and private breeders offer this small-sized mammal as an attractive pet for those who seek the unusual or an “easy” caged pet. Some of these sugar gliders may show for a routine care and elective surgical neutering, but the majority will show for treatment of an illness. As in many caged animals without routine care and observation, many chronic diseases are presented as an acute onset of illness and are in need of an emergency care.

Sugar gliders can develop a wide variety of disease problems, including infectious, traumatic, metabolic, and neoplastic conditions. Improper husbandry and sub-optimal diet are often the underlying causes of an illness in sugar gliders.

Knowing the natural history of sugar gliders can explain the challenges of keeping them as pets. Native to Australia and New Guinea, the sugar glider is a highly social marsupial that is an omnivorous, arboreal, and nocturnal gliding possum. Keeping a nocturnal animal can be frustrating for some pet owners as the glider would spend the majority of the daytime sleeping in a hide box or a hammock, and may not respond favorably if awakened suddenly. Large, tall enclosures with multiple levels made of branches and ropes are required to encourage exercise and prevent the common issue of obesity. The cage should be covered from 2-3 sides and include a hide box in order to provide a sense of protection for this prey species. The nesting box and all food and water dishes should be secured in a high position in the cage. The recommended ambient temperature should be 75-88F (24-31C); lower temperatures can induce a torpor-like state and hyperthermia, and may show as a respiratory emergency. Keeping a highly social animal alone or with minimal physical contact with its owners is a common cause of behavioral and health issues. Biting the owners, vocalization and stress-related self-trauma are common in these cases.

The sugar glider’s natural diet includes invertebrates, small vertebrates, blossom nectar, and sap of trees (native eucalyptus). Although there are commercial specialized diets and homemade “wholesome” recipes (Leadbeater’s mixture), obesity, failure to thrive, hypoglycemia, calcium deficiency and metabolic bone disease are common dietary-related disorders in captivity. Hypoglycemic or hypocalcemic sugar gliders can present for seizure-like or other neurological symptoms. Sugar gliders with metabolic bone disease commonly exhibit hind limb

weakness. Obtaining the medical history and detailed description of the husbandry and diet composition are therefore imperative. The recommended daily ration for a captive sugar glider diet is for 25-35 grams of food. This daily ration might consist of 15 grams of Leadbeater's diet or other nectar, 15 grams of insectivore diet and about 2.5 grams of "treats" (fruits, vegetables, bee pollen, insect larval forms, and some seeds/nuts). Gut-loaded insects can be another live-protein source and are also important for enrichment. The food should be offered in the evening when the gliders are awake and fresh water should be available at all times.

Trauma, especially from mishandling or a predator (house cats) is also common. Sugar gliders cannot swim and should be kept away from open-top water sources like tubs, sinks, fish tanks, and similar containers.

The clinical evaluation of the glider should start with a careful visual examination before any handling. Observation of the mentation, movement, respiratory pattern, and the appearance of the nose, eyes, lips, fur, and feet can minimize the stress and time of handling. Physical examination of sugar gliders is challenging due to their defensive behavior (evading, biting and loud vocalizations). Time-efficient gas (isoflurane/sevoflurane) anesthesia is usually required for complete physical examination, blood sampling, imaging and safe administration of treatments.

As in other species, a minimal database (complete blood count, blood chemistry panel, fecal examination, and urinalysis) is important for an overall health assessment of the patient. The cranial vena cava is the only reliable site for venipuncture in sugar gliders (using a pre-heparinized 1ml syringe with a 27G needle), and this should always be done under complete chemical immobilization due to its potential risks.

Treatments for sugar gliders are in general, similar to those for other small mammals seen in the practice. However, the relatively smaller body size makes some of the treatment modalities extremely challenging and often sub-optimal, especially for emergency treatments. Severely diseased sugar gliders may present obtunded and moribund. Despite this, fluids, supplemental heat, and assisted feeding are often sufficient for a clinical resolution. Hospitalization for 24- 48 hours with supportive care is often indicated before they can be further assessed.

When indicated, oxygen can be delivered via a face mask or in an oxygen chamber. For vascular access, the intraosseous (IO) route is the realistic route, using a 25G hypodermic needle placed in the proximal tibia in an aseptic technique. However, bone perforation and fractures are a real risk for IOs. Subcutaneous fluid administration is easy but these (and other SC injections) should not be given in the lateral skin flaps (patagium) as dermal necrosis often develops in this sensitive area.

Drug dosages for sugar gliders are largely anecdotal, and several published formularies suggest dosages for common medications and are usually based on an individual experience. Dosages for drugs not reported are typically extrapolated from other species, and these should be used with caution while carefully monitoring the patient; keep in mind that the metabolic rate of the sugar glider is about 45% below that predicted for a eutherian (placental) mammal of comparable size. Although sugar gliders have a well-developed cecum for the bacterial fermentation of complex

polysaccharides, they do not seem to suffer adverse effects (dysbiosis) from the antibiotic therapy.

The most common surgical procedure performed in sugar glider is an elective neutering of the male. The recommended technique is of total ablation of the pendulous scrotal sac, severing the connecting tissues using sharp dissection and ligation, surgical laser or electrocautery. Postoperative care must include proper analgesia with buprenorphine (0.01-0.02mg/kg bid-tid SC) or meloxicam (0.1-0.2mg/kg sid-bid SC/PO). Sugar gliders tend to chew their incisions immediately following anesthetic recovery and this can be prevented by careful tissue manipulation, avoiding skin sutures, application of a deterrent paste on the incision and placement of an E-collar (commercial products made for laboratory rats).

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