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Permalink

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Journal

Journal of the American Veterinary Medical Association, 189(9)

ISSN

0003-1488

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Publication Date

1986-11-01

Peer reviewed

Subconjunctival hibernoma in a goose

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A 2-YEAR-OLD MALE white goose (*Aser domesticus*) was brought to the ophthalmology service of the Veterinary Medical Teaching Hospital for evaluation of a mass on its right eye. The mass was first noticed one month previously and had slowly increased in size since that time. The mass had not seemed to irritate the eye and an ocular discharge had not been observed. The goose had a large, raised, granular, pink-yellow, subconjunctival mass involving the ventral and lateral aspects of the right globe. The mass protruded through the palpebral aperture from the globe and interfered with lid closure. The tendon of the pyramidalis muscle passed through the center of the mass and caused the mass to dimple when a membrana nictitans excursion was elicited. The left eye had an iris cyst. Otherwise, both eyes appeared normal.

A fine-needle aspirate of the mass yielded blood (erythrocytes, thrombocytes, and macrophages). Differential diagnoses considered at this time included xanthoma, other neoplasia, and foreign body granuloma.

Because of the progressive enlargement of the mass and concern that the mass would eventually interfere with normal function of the lids and membrana nictitans, the mass was excised. The goose was anesthetized with isoflurane^a and placed in left lateral recumbency. A fine-wire lid speculum was placed in the palpebral aperture and a 4-mm conjunctival incision was made over the mass. The mass was removed piecemeal, using forceps and an iris spatula. Care was taken to preserve the integrity of the pyramidalis tendon. Pieces of the mass were fixed in 10% formalin and processed for light and electron microscopy. After removal of the mass, the conjunctival incision was sutured with 6-0 polyglactin 910.^b Recovery from anesthesia was uneventful. Polymyxin-bacitracin-gramicidin^c solution was placed on the right eye 3 times/day for 5 days after surgery. After resection of the mass, function of the lid and membrana nictitans returned to normal.

Histologic sections of the mass were stained with hematoxylin and eosin. The mass was composed primarily of faintly eosinophilic, foamy cells, with central to paracentral nuclei (Fig 1). The cells contained a large amount of cytoplasm. The mass was well vascularized and contained a delicate stromal framework. Interspersed throughout the mass were accumulations of amorphous eosinophilic material

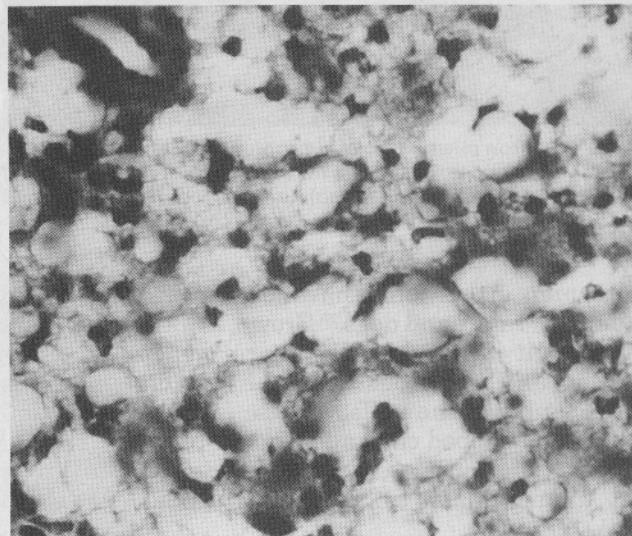


Fig 1—Photomicrograph of subconjunctival hibernoma specimen from a domestic goose. The foamy appearing cells are brown fat cells. H&E stain; $\times 460$.

that were birefringent with polarized light. The cells and amorphous material stained with oil red O in frozen sections. Specimens of the mass stained faintly with the periodic acid-Schiff reaction. Acid-fast organisms (Ziehl-Neelsen stain) and amyloid (cresyl violet stain) were not found.

Using transmission electron microscopy, numerous lipid droplets that were not enclosed by membrane were seen in the cytoplasm of tumor cells (Fig 2). The cytoplasm also contained large numbers of mitochondria. The tumor cells had a basal lamina. The histologic and ultrastructural findings were considered compatible with a diagnosis of hibernoma. Twelve months after surgery, the tumor had not recurred.

Ocular neoplasms are encountered infrequently in birds. Viral-induced lymphoma,¹ hemangioendothelioma,² melanoma,^{2,3} rhabdomyosarcoma,⁴ and adenocarcinoma⁴ have been reported. Of these, only melanoma and adenocarcinoma involved species other than poultry.

The initial histologic findings were indicative of a possible xanthoma because the primary cell type resembled a foamy macrophage and because birefringent amorphous material was found intercalated between cells. However, xanthomas typically contain a thick connective tissue stroma and a lymphoid infiltrate and (with polarized light) have birefringent maltese crosses characteristic of cholesterol esters.⁵

Hibernoma is an extremely rare benign neoplasm of brown fat which derives its name from its morphologic similarity to the hibernating gland found in

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The authors thank Drs. Lyn Oliphant, David Graham, Peter Moore, Lisa Miller, Linda Lowenstine, and Ginny Bergman for technical assistance.

^aForane, Ohio Medical Anesthetics, Airco Inc, Madison, Wis.

^bVicryl, Ethicon Inc, Somerville, NJ

^cNeosporin, Burroughs Wellcome Co, Research Triangle Park, NC.

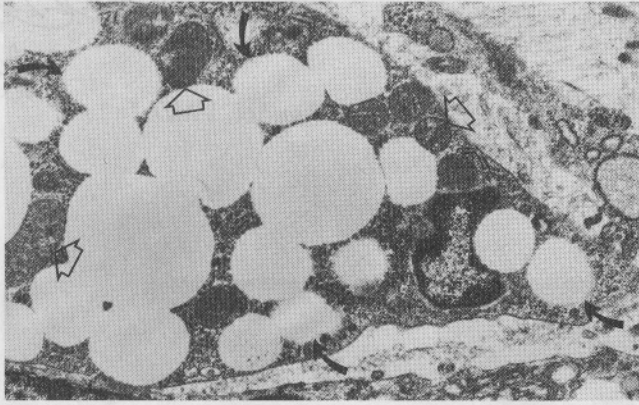


Fig 2—Electron micrograph of subconjunctival hibernoma specimen from a goose. Notice the mitochondria (open arrows) and the multiple lipid droplets that are not membrane-enclosed (closed arrows). $\times 1,183$.

mammals. Hibernomas have been reported in human beings,^{6,7} rats^{8,9} and dogs.¹⁰ Brown, multilocular fat is important in nonshivering thermogenesis in hibernating and numerous neonatal mammals and has been found in the ruffed grouse (*Bonasa umbellus*) and black-capped chickadee (*Parus atricapillus*).¹¹ In these 2 avian species, the brown fat (similar to brown fat in mammals) consists of polygonal cells with

central nuclei, multiple lipid droplets, and numerous well-developed mitochondria and has a rich vascular network. In the goose of the present report, whether the tumor developed de novo or was the result of neoplastic transformation of preexisting brown fat tissue was not determined.

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Pansteatitis in great blue herons

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FROM OCT 17 to Nov 14, 1985, 3 wild great blue herons (*Ardea herodias*) that were unable to fly or stand were brought by private citizens to the Chesapeake Wildlife Sanctuary for treatment. On the basis of physical examination, each heron was weak, lethargic, and 5% to 10% dehydrated. Each bird had large amounts of firm, lobulated, subcutaneous fat over most of its body, causing the overlying skin to have a nodular appearance. Firm masses were palpable in the abdominal cavity of each heron. Each bird was given 60 to 100 ml of 5% glucose solution orally and was force-fed fish and mouse parts.

The first heron evaluated (heron 1), an immature male, was found dead the day after initial examination. Heron 2, an immature female, was force-fed fresh, whole mice and pieces of thawed fish (spot and bluefish) daily for 15 days. Heron 2 improved

clinically and was able to walk by day 7 after initial evaluation; however, on day 14, heron 2 again was unable to stand and died on day 15.

During the initial examination of heron 3 (an adult male), blood samples were collected, a hemogram was performed, serum vitamin E (α -tocopherol) concentration was determined, and a biopsy specimen of subcutaneous fat was collected. Steatitis was diagnosed on the basis of histologic features of the fat specimen. The bird was hypoproteinemic (total protein, 3.6 g/dl; normal = 4.5 to 5.8 g/dl^a) and had a regenerative anemia (PCV, 17.5%; normal = 38% to 45%^a) with severe poikilocytosis and anisocytosis.

Each day, heron 3 was supplemented orally with 400 IU of vitamin E^b and force-fed mice and fish. Heron 3 had marked clinical improvement during the following 4 weeks. On day 28, hematologic results indicated that heron 3 was no longer anemic (PCV, 40%) but examination of a biopsy specimen of the

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Supported by a Senior Research Project Assistantship from the Friends of the National Zoo.

The authors thank the staff and volunteers of the Chesapeake Wildlife Sanctuary in Bowie, Md, for the assistance with these cases.

^aNormal values for hemograms and serum protein were based on data from herons 4 and 5.

^bVitamin E, 200 IU capsules, Dart Drug Inc, Landover, Md.