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Authors: Ramos-Vara, José A., Miller, Margaret A., and Craft, Donna

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Intestinal Plasmacytoma in an African Hedgehog

José A. Ramos-Vara,[1] Margaret A. Miller,[2] and Donna Craft,[3] [1]Animal Health Diagnostic Laboratory, Michigan State University, East Lansing, Michigan 48824, USA; [2] Veterinary Medical Diagnostic Laboratory, University of Missouri, Columbia, Missouri 65211, USA; [3] Department of Pathology, Michigan State University, East Lansing, Michigan 48824, USA; [4] Corresponding author e-mail: RAMOSVARA@AHDLMS.CVM.MSU.EDU.

ABSTRACT: A 3-yr-old male African hedgehog (*Atelerix albiventris*) had anorexia and weight loss for 1 wk before its death. The colon and mesocolon were diffusely infiltrated by a neoplastic proliferation of round cells with plasmacytoid features. A diagnosis of intestinal plasmacytoma was made and confirmed by electron microscopy. No other organs appeared to be affected. This is the first description of intestinal plasmacytoma in a hedgehog.

Key words: African hedgehog, *Atelerix albiventris*, case report, intestine, neoplasm, plasmacytoma.

In July 1995, a 3-yr-old, male, African hedgehog (*Atelerix albiventris*) pet died naturally after 1 wk of anorexia and weight loss. Gross findings at necropsy by the referring veterinarian were an enlarged and pale liver consistent with hepatic lipidosis. Samples of liver, intestine, stomach, spleen, kidney, urinary bladder, vesicular gland, lung, and heart were submitted to the Veterinary Medical Diagnostic Laboratory at the University of Missouri (Columbia, Missouri, USA), fixed in 10% neutral buffered formalin, embedded in paraffin, sectioned at 5 μm, and stained with hematoxylin and eosin (HE), Giemsa, periodic acid-Schiff (PAS) and alkaline Con-

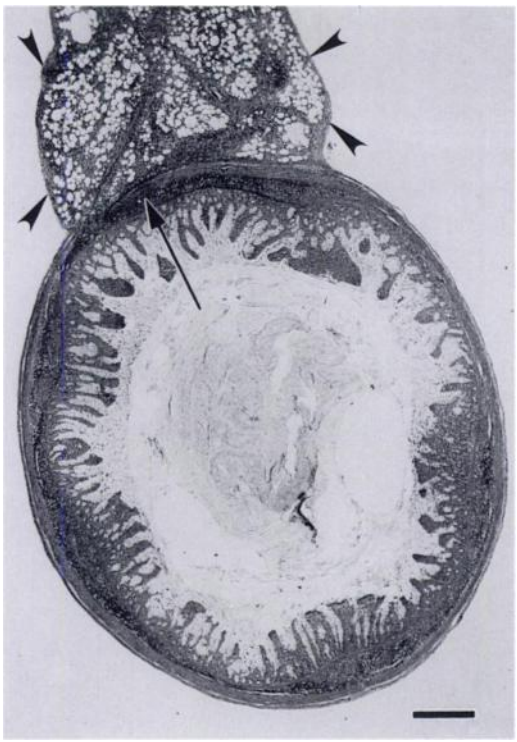

FIGURE 1. Colon of an African hedgehog with plasmacytoma. Note the diffuse infiltrate in the mucosa and submucosa. The mesocolon (arrowheads) and the muscularis adjacent to the mesocolon also is infiltrated (arrow). H&E stain. Bar = 2.6 μm.

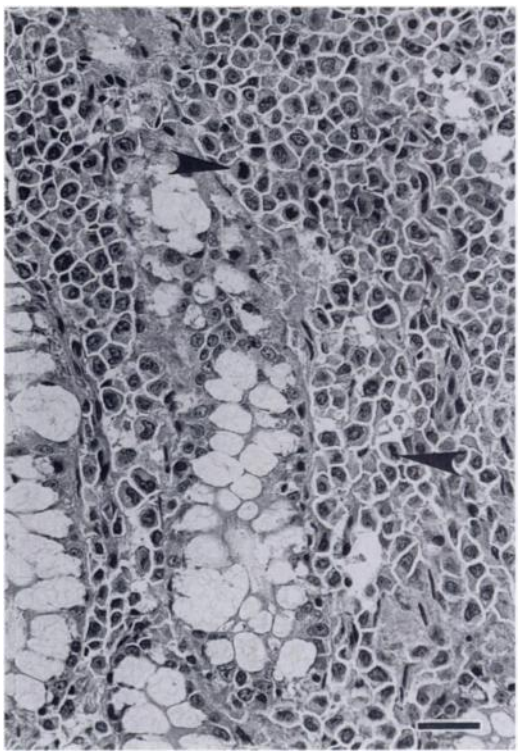

FIGURE 2. Colon of an African hedgehog, showing detail of the neoplastic infiltrate in the lamina propria. Plasmacytoid cells are diffusely infiltrating the lamina propria. Several mitosis are seen (arrowheads). H&E stain. Bar = 65 μm.

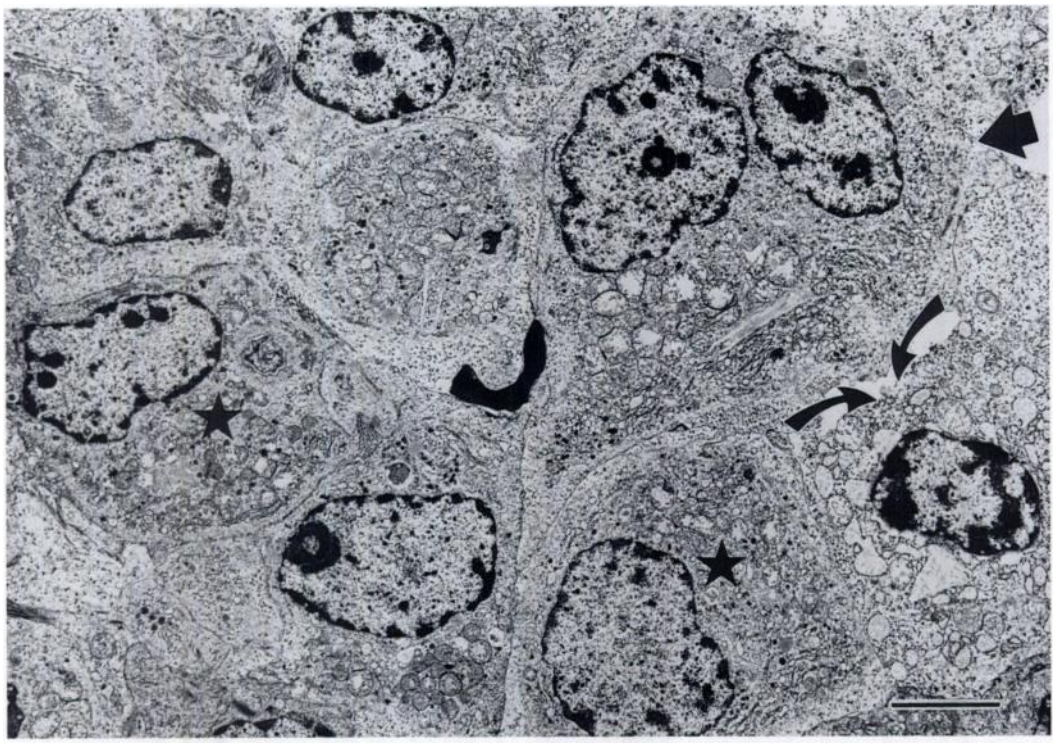

FIGURE 3. Colon of an African hedgehog with population of round cells containing numerous mitochondria and poorly developed endoplasmic reticulum profiles. There is a multinucleated giant cell (arrow) and a cell with typical plasmacytoid features (curved arrows). Immature lymphoid cells with numerous mitochondria and dense granules are seen (stars). Transmission electron microscopy. Uranyl acetate-lead citrate stain. Bar = 3.6 μm.

go red stains (Francis, 1982). Histologically, the colon was thickened by diffuse neoplastic proliferation in the lamina propria and submucosa (Fig. 1) of 12 to 16 μm diameter round cells with moderate to abundant eosinophilic to amphophilic cytoplasm and a central or eccentric round nucleus with reticulated to coarse chromatin and an occasional central nucleolus (Fig. 2). Mitotic figures ranged from none to three per microscopic high power field of view. These cells did not contain metachromatic granules when stained with Giemsa stain. There also were clusters of mature plasma cells in the mucosa and submucosa. Multifocally, neoplastic cells also were infiltrating the intestinal tunica muscularis. Neoplastic cells diffusely infiltrated the contiguous mesocolon that had areas of hemorrhage. The degree of differentiation into plasma cells in the mesocolon was higher than that in the colon. There were occasional multinucleated giant cells in both the colon and mesocolon. Alkaline Congo red stain under polarized light did not reveal amyloid deposits in the intestines, spleen, heart, or kidneys. Cardiac microscopic lesions included scattered areas of myofiber disarray, loss of cross-striations, and interstitial fibrosis. There were multiple subacute to chronic renal infarcts and diffuse hepatocellular vacuolation, periportal hepatitis, and bile duct hyperplasia. No lesions were observed in the spleen, lung, or vesicular glands.

Formalin-fixed colon with the neoplasm was diced into 1 mm^3 cubes, postfixed in 1% osmium, embedded in Epon-Araldite (Polysciences, Warrington, Pennsylvania, USA), sectioned, and stained with uranyl acetate and lead citrate. Ultrathin sections

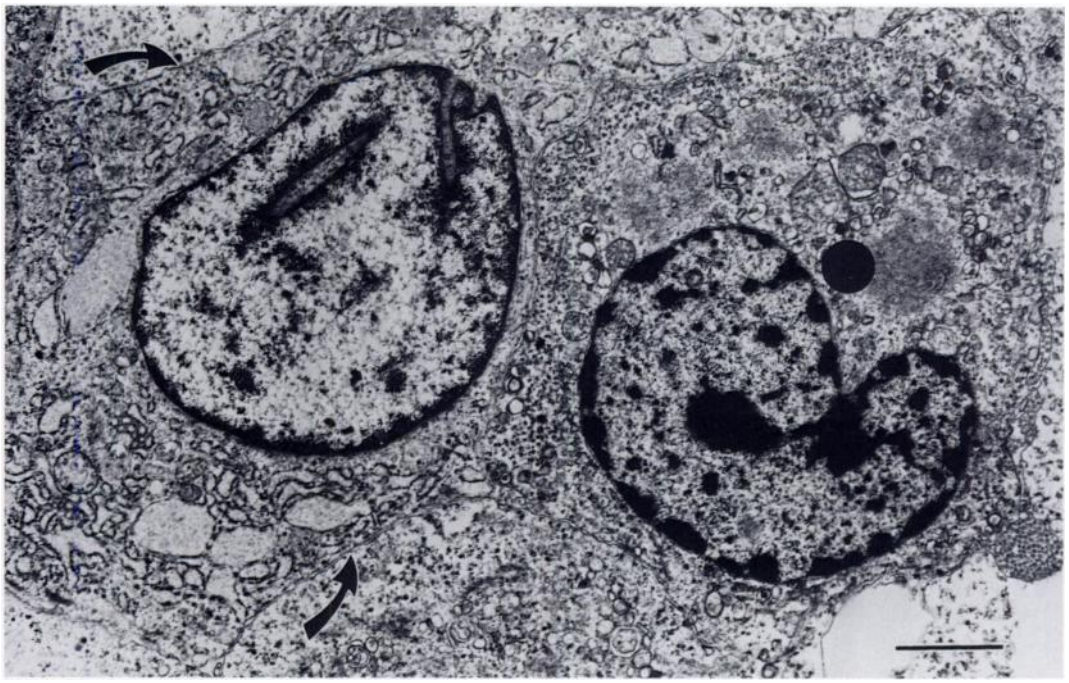

FIGURE 4. Colon of an African hedgehog showing detail of a plasmacytoid cell with abundant endoplasmic reticulum profiles (arrows). There is an adjacent cell with poorly developed endoplasmic reticulum, numerous ribosomes and vesicles (circle). Transmission electron microscopy. Uranyl acetate-lead citrate stain. Bar = 1.6 μm.

were examined with a Philips 303 (Philips Electronic Instruments, Mahwah, New Jersey, USA) transmission electron microscope operated at 60 Kv. Two types of round cells comprised the bulk of the tumor. The more numerous type was 12 to 20 μm in diameter, with numerous mitochondria and ribosomes, scattered cytoplasmic vesicles, and occasional endoplasmic reticulum profiles (Fig. 3). Intermediate filaments surrounded the nucleus. The nucleus was usually oval to round, but in some cells it had indentations or was bean-shaped. Euchromatin was abundant. The second type of cell measured 10 to 12 μm in diameter and had plasmacytoid features with abundant rough endoplasmic reticulum that occasionally was dilated and contained variably electron-dense floccular material (Fig. 4). Cells with intermediate features were observed occasionally as well as binucleated or multinucleated cells (Fig. 3).

Detailed reports of neoplasms in hedgehogs are few and include cutaneous squamous cell carcinoma (Frye and Dutra, 1973), mast cell tumor (Raymond et al., 1997), pituitary adenoma (Campbell and Smith, 1966), myelogenous leukemia (Hruban et al., 1992), sarcomas (Peauroi et al., 1994), renal transitional cell carcinoma and hepatic adenoma (Bunton, 1993) and oral carcinoma (Reams and Janovitz, 1992). Based on the light microscopic and ultrastructural findings, the neoplastic process described in this animal is consistent with plasmacytoma. Although we did not have access to the carcass, the lack of neoplastic cells in other organs examined makes the intestine the most likely primary site of neoplastic growth.

Intestinal plasmacytomas are uncommon in domestic species but have been described in dogs and cats (Vail, 1996). The majority are unrelated to multiple myeloma but can metastasize to multiple organs (Jackson et al., 1994; Trevor et al., 1993). In our experience, intestinal plas-

macytomas in dogs are usually well circumscribed submucosal nodules as opposed to the one found in this hedgehog that infiltrated the lamina propria, submucosa, muscularis, and extended into the mesocolon.

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LITERATURE CITED

BUNTON, T. E. 1993. The immunocytochemistry of cytokeratin in fish tissues. Veterinary Pathology 30: 418–425.

CAMPBELL, D. J., AND W. T. SMITH. 1966. A pituitary adenoma in a hedgehog (*Erinaceus europaeus*). Endocrinology 79: 842–844.

FRANCIS, R. J. 1982. Amyloid. *In* Theory and practice of histochemical techniques, 2nd Edition, J. D. Bamcroft and A. Stevens (eds.). Churchill Livingstone, Edinburgh, UK, pp. 155–179.

FRYE, F. L., AND F. R. DUTRA. 1973. Squamous cell carcinoma of the feet of an Indian hedgehog. Journal of Wildlife Diseases 9: 249–250.

HRUBAN, Z., J. VARDIMAN, T. MEEHAN, F. FRYE, AND W. E. CARTER. 1992. Haematopoietic malignancies in zoo animals. Journal of Comparative Pathology 106: 15–24.

JACKSON, M. W., S. C. HELFAND, S. L. SMEDES, G. A. BRADLEY, AND R. D. SCHULTZ. 1994. Primary IgG secreting plasma cell tumor in the gastrointestinal tract of a dog. Journal of the American Veterinary Medical Association 204: 404–406.

PEAUROI, J. R., L. J. LOWENSTINE, R. J. MUNN, AND D. W. WILSON. 1994. Multicentric skeletal sarcomas associated with probable retrovirus particles in two African hedgehogs (*Atelerix albiventris*). Veterinary Pathology 31: 481–484.

RAYMOND, J. T., M. R. WHITE, AND E. B. JANOVITZ. 1997. Malignant mast cell tumor in an African hedgehog (*Atelerix albiventris*). Journal of Wildlife Diseases 33: 140–142.

REAMS, R. Y., AND E. B. JANOVITZ. 1992. Oronasal squamous cell carcinoma in an African hedgehog (*Erinaceidae albiventris*). Journal of Wildlife Diseases 28: 148–150.

TREVOR, P. B., G. K. SAUNDERS, D. R. WALDRON, AND M. S. LEIB. 1993. Metastatic extramedullary plasmacytoma of the colon and rectum in a dog. Journal of the American Veterinary Medical Association 203: 406–409.

VAIL, D. M. 1996. Plasma cell neoplasms. *In* Small animal oncology, 2nd Edition, S. J. Withrow and E. G. MacEwen (eds.). W. B. Saunders Company, Philadelphia, Pennsylvania, pp. 509–520.

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