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## Intestinal Plasmacytoma in an African Hedgehog

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**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  $\mu$ m, 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  $\mu$ m.

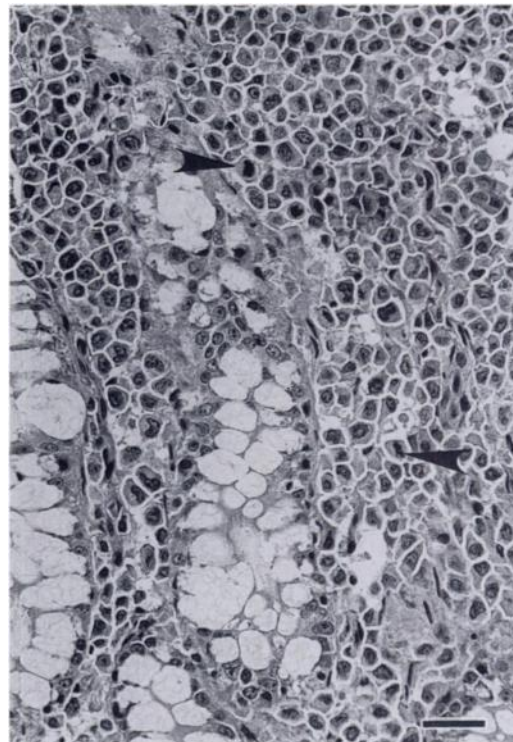


FIGURE 2. Colon of an African hedgehog, showing detail of the neoplastic infiltrate in the lamina propria. Plasmacytoid cells are diffusely infiltrating the lamina propria. Several mitosis are seen (arrowheads). H&E stain. Bar = 65  $\mu$ m.

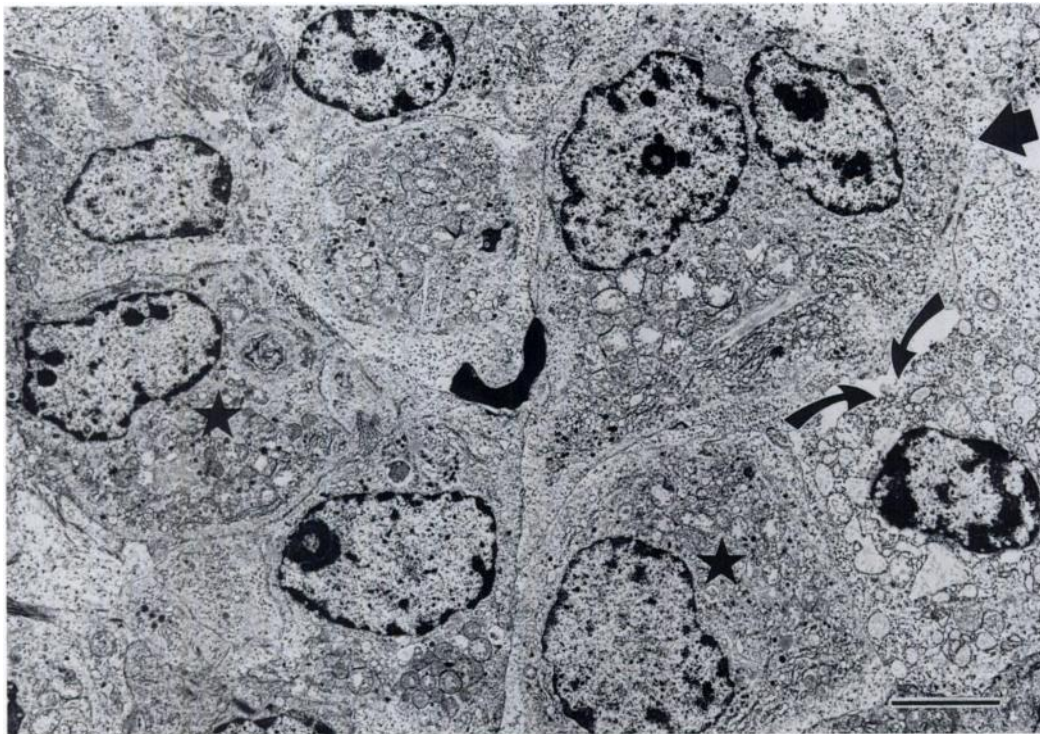


FIGURE 3. Colon of an African hedgehog with population of round cells containing numerous mitochondria and poorly developed endoplasmic reticulum profiles. There is a multinucleated giant cell (arrow) and a cell with typical plasmacytoid features (curved arrows). Immature lymphoid cells with numerous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

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  $\mu\text{m}$  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 me-

socolon 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  $\text{mm}^3$  cubes, postfixed in 1% osmium, embedded in Epon-Araldite (Polysciences, Warrington, Pennsylvania, USA), sectioned, and stained with uranyl acetate and lead citrate. Ultrathin sections

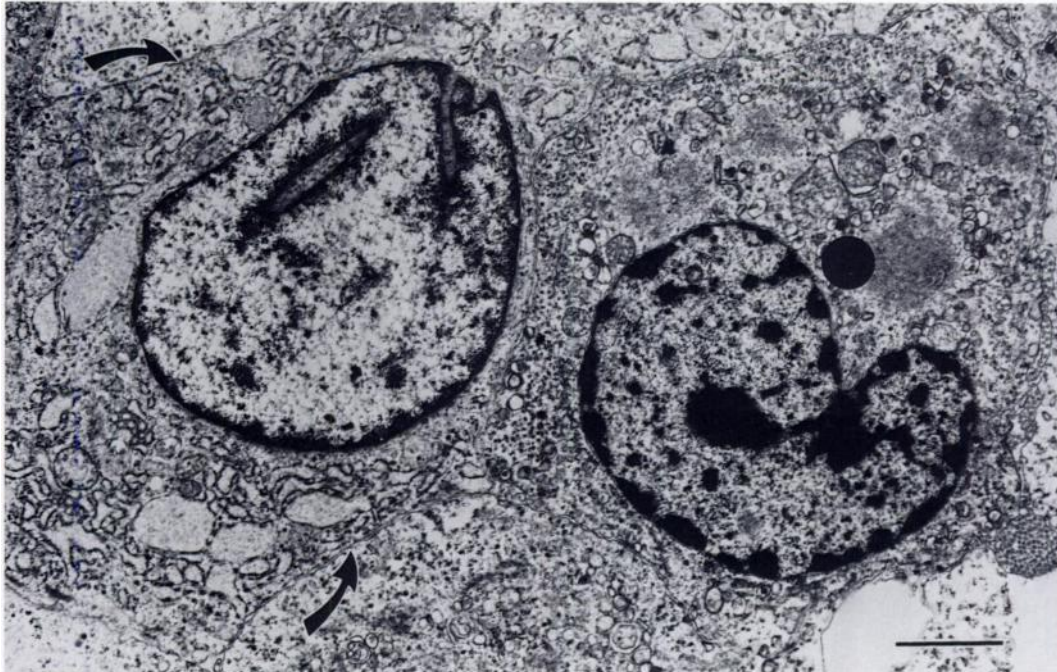


FIGURE 4. Colon of an African hedgehog showing detail of a plasmacytoid cell with abundant endoplasmic reticulum profiles (arrows). There is an adjacent cell with poorly developed endoplasmic reticulum, numerous ribosomes and vesicles (circle). Transmission electron microscopy. Uranyl acetate-lead citrate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

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  $\mu\text{m}$  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  $\mu\text{m}$  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 hedge-

hogs 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-

macytomomas 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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