

## A case of Pigmented Apocrine Hidrocystoma in dog

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### ABSTRACT

A 10-year-old female mongrel dog presented with a swelling in the skin on the right chest. The lesion was clinically pigmented; therefore, melanoma was suspected. Gross examination revealed, the lesion to be encapsulated, well demarcated, and multicystic. Histopathological examination showed that it was not composed of melanocytes. The tumor comprised apocrine cells with intracytoplasmic granules, which stained positive for iron, Sudan black B, and Periodic acid Schiff (PAS), in addition to small papillary growths containing PAS-positive fluid within the cyst lumen. Immunohistochemistry showed that, the cyst wall comprised  $\alpha$ -SMA-positive spindle cells and apocrine gland epithelial cells, which were negative for Ki-67. These findings are consistent with apocrine hidrocystoma in humans and cats; therefore, the case was diagnosed as pigmented apocrine hidrocystoma. This may be the first reported case of a pigmented apocrine hidrocystoma in canines and may be of clinical relevance for differentiating such lesions from other pigmented tumors, including melanoma.

**Keywords:** dog, melanoma, pathology, pigmented apocrine hidrocystoma.

### INTRODUCTION

Apocrine sweat gland tumors are common in dogs, and nearly 70% of them are benign.<sup>7</sup> Benign apocrine adenomatous cystic formation is called apocrine hidrocystoma.<sup>8,12</sup> It usually occurs as solitary lesions on the head, neck, chest, scalp, ear, and/or extremities.<sup>12</sup> Apocrine hidrocystoma has been reported in humans, <sup>1,2,9,12,15</sup> and is associated with pigmentation in some cases.<sup>1,9,14</sup> It also occurs on the eyelid of cats.<sup>4,5</sup> The presence of multiple cell layers lining the cyst wall, small papillary folds in the lumen, and no pressure atrophy on the cyst wall are indicative of a neoplastic phenotype.<sup>8</sup> The present study reports the first histopathologic description of a pigmented apocrine hidrocystoma in canines.

A 10-year-old female mongrel dog was presented to the veterinary clinic with skin swelling. The lesion, located on the skin of the right chest, measured 5 × 4 × 1 cm and was grossly pigmented; therefore, the veterinarian suspected melanoma. The lesion was surgically removed, preserved in 10% neutral buffered formalin, and presented for definitive diagnosis by histopathology.

Routine histopathological examination was performed after the tissue was processed and embedded in paraffin. Tissue sections (4  $\mu$ m thickness) were cut and then stained with hematoxylin and eosin. Other sections were stained with Prussian blue stain (to detect iron), Fontana silver (for melanin), Sudan black B (for lipofuscin), and PAS (for apocrine granules).<sup>3</sup>

Immunohistochemistry (IHC) was performed to detect  $\alpha$ -smooth muscle actin (SMA) and Ki-67 using monoclonal mouse anti-human  $\alpha$ -SMAa (1:100) and monoclonal mouse anti-human Ki-67a (1:200) antibodies, respectively. Labeled polymera was used as a secondary antibody and to be visualized by 3,3'-diaminobenzidine.

## **Results**

Gross examination revealed that, the lesion appeared to be encapsulated, well- demarcated, and multicystic, with brown-o-black contents (Fig. 1). Some of the cysts showed white papillary projections from the wall into the cyst lumen. Histopathology revealed that, the mass was located in the dermis and extended to the subcutaneous tissue. It comprised a cystically dilated apocrine gland. The cyst wall comprised an inner layer of single or multilayered cuboidal-to-columnar epithelium with eosinophilic cytoplasm that showed decapitation secretion and occasional pigmented granules. Some small papillary growths projected into the cyst lumen (Fig. 2). These papillary growths were formed from apocrine epithelium and supporting myoepithelial cells. IHC showed that the myoepithelial cells were positive for  $\alpha$ -SMA, while the apocrine epithelium nuclei were negative for Ki-67. The granules were positive for Prussian blue and PAS (Fig. 3 and, 4) and, occasionally, for Sudan black B stains; however, the granules in the cyst wall did not stain with Fontana silver (data not shown). The cysts were filled with homogenous eosinophilic fluid that was strongly positive upon PAS staining. No mitosis was detected in cells of the cyst walls, and there were no signs of metastasis to the lymph or blood vessels. There was some evidence of fresh hemorrhage into the subcutaneous tissue.

## **DISCUSSION**

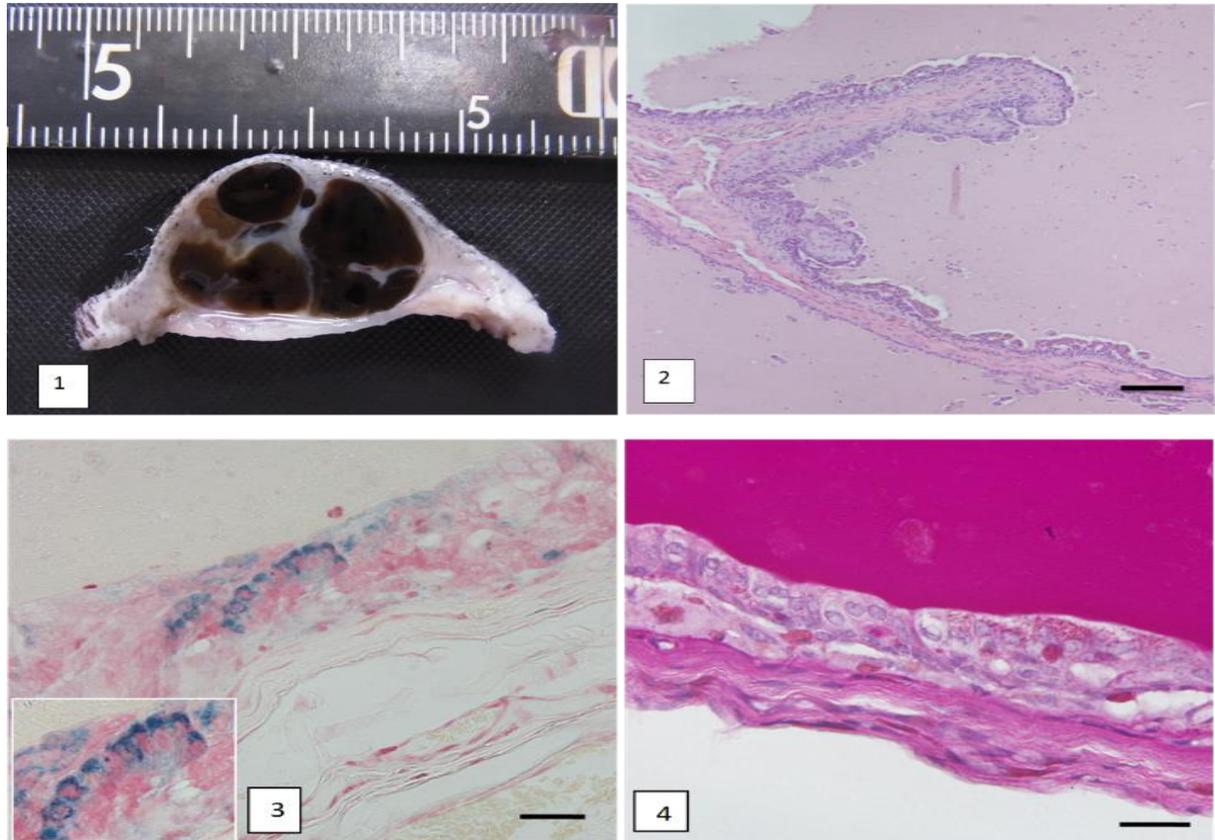
This report describes the morphological examination of a pigmented apocrine hidrocystoma in a dog. Apocrine hidrocystoma is a rare and uncommon tumor in dogs.<sup>8</sup> Such tumors have been reported in humans and cats and there are some hypotheses regarding the pathogenesis of this lesion. Some reports suggest

that it is an adenomatous proliferative tumor resulting from papillary growth<sup>11,14</sup>, while the others suggest that it is a retention cyst caused by excretory duct obstruction.<sup>6</sup>

In the present case, the mass was pigmented and, therefore, initially diagnosed as melanoma. Histopathological examination revealed that, the tumor was not melanoma; rather, it appeared to be cystic, with multifocal small papillary growths resembling apocrine hidrocystoma in humans and cats.<sup>1,2,4,5,9,12,15</sup> In humans, apocrine hidrocystoma is pigmented; although it not clear whether this is due to lipofuscin<sup>1</sup> or melanin.<sup>9</sup> Other studies failed to identify the origin of pigmentation, and suggested that it was due to Tyndall effect.<sup>11,14,15</sup> Another study suggested that the inspissation may be responsible for the brown secretory product.<sup>8</sup> In the present case, the cytoplasm of the apocrine epithelial cells contained granules that were positive for iron, PAS, and Sudan black staining, but negative for melanin staining. The luminal secretions were strongly PAS-positive. The pigmented appearance of this lesion may, at least in part, be due to the presence of lipofuscin. The presence of lipofuscin and its oxidized derivative are responsible for the pigmentation observed in human apocrine hidrocystoma. <sup>1</sup>

The gross appearance of this lesion led to an initial diagnosis of melanoma. Melanoma is clinically characterized by pigmentation, and the tumor cells are spindle-shaped, round-to polygonal, and balloon-shaped<sup>8</sup>; however, the location of the tumor in the present case coupled with the presence of luminal decapitation secretion, tumor cells with an eosinophilic cytoplasm, and cytoplasmic granules positive for iron and PAS staining<sup>13</sup>, suggested the apocrine origin of this lesion.

In conclusion, this case report describes the first case of pigmented apocrine hidrocystoma in a dog. The tumor was pigmented and easily confused with other pigmented tumor skin lesions, including melanoma; therefore, careful differential diagnosis is required in such cases.



**Fig.1:** Gross examination revealed the multicystic nature of lesion with brown to black coloration. **Fig.2:** Presence of papillary projection in the cyst cavity with eosinophilic cytoplasm and decapitation and homogenous eosinophilic fluid in the cyst cavity. HE. Bar 20  $\mu$ m. **Fig.3:** Positive intracytoplasmic blue iron granules. Prussian blue stain. Bar 40  $\mu$ m. Nuclear counter stained with the neutral red. Inset is high magnified field of positive area. **Fig.4:** PAS positive granules. Periodic acid Schiff stain. Bar 40  $\mu$ m. Nuclear counter stained with Mayer's haematoxylin

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a.  $\alpha$ -SMA, Ki-67, and labeled polymer were obtained from; Dako Denmark A/S, Glostrup, Denmark.

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