Mammary Adenocarcinoma with Pulmonary, Hepatic and Renal Metastasis in a Chinchilla (Chinchilla laniger)

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ABSTRACT

Background: Chinchillas are small, long-lived hysticomorph rodents closely related to guinea pigs, porcupines and agoutis. Used extensively in scientific research and fur production, its use as a pet has grown exponentially in the last decade, increasing their presence in veterinary clinics and hospitals. The most common health conditions for chinchillas kept as pets are a result of husbandry or dietary deficiencies, and they rarely develop neoplasia. Although rare, neoplasias do occur in these animals and should be included as differential diagnosis. This report describes the occurrence of mammary adenocarcinoma in a companion chinchilla with several metastatic foci in lungs, liver and kidneys.

Case: A 6-year-old female chinchilla (Chinchilla laniger) was presented with progressive hyporexia, apathy and a volume increase in the right axillary region. Since the owner noted purulent secretion in the ulcerated mass, he began treatment, without veterinarian consent, using topical rifampicin, 0.5 mL dipyrone sodium oral and 1.5 mL of enrofloxacin. All of which were used orally, once a day, for five days. On presentation at the veterinary hospital, the animal was poorly responsive, mildly dehydrated and had moderate body condition. Physical examination revealed pale mucous membranes, body temperature of 36.4°C and an increased volume, soft upon palpation, near inguinal area. The mass in the right axillary region was adhered, soft and ulcerated. A fine-needle aspiration was performed and the animal was sent home with instructions to perform forced feeding until the cytology results were obtained, which were inconclusive. At the owner’s request, no other diagnostic tests were performed. Six days after initial examination the animal lost 5% of its body weight as anorexia, lethargy and locomotion difficulties progressed, at which point the owner requested euthanasia. The animal was sent for postmortem examination.

Discussion: At the time of the necropsy the animal presented great abdominal distention. Gross inspection revealed a slightly firm nodule in the right axillary region measuring 5x5x3 cm, with an area of ulceration of 1 cm in diameter. Another slightly firm nodule of 1 cm in diameter, dark red when cut, was observed in the right inguinal region. Histopathological examination of the mammary gland revealed a delimited and unencapsulated neoplastic proliferation, organized in multiple lobules separated by moderate to severe fibrovascular stroma. Neoplastic cells were arranged in acinar and tubular structures, showing moderate anisokaryosis and anisocytosis, with nuclei ranging from round to oval with one to two evident nucleoli. Cytoplasm was scanty and eosinophilic, with undefined cell borders. Focal areas of coagulative necrosis were present. The epidermis showed moderate irregular diffuse hyperplasia. Based on these findings, the tumor was characterized as a mammary adenocarcinoma. Metastatic nodules with the same cellular features were found in the lungs, liver and kidney. With these animals being kept as pets and becoming geriatric patients, it is expected that the number of neoplasias will increase considerably in the future and there is limited data about metastatic behaviour of tumor in chinchillas. To the author’s knowledge, this is the first report of a mammary adenocarcinoma with metastatic sites in Chinchilla laniger.

Keywords: tumor, rodent, neoplasia, exotic pet.

Descritores: tumor, roedor, neoplasia, pet exótico.
INTRODUCTION

Chinchillas are small, long-lived hysticomorph rodents closely related to guinea pigs, porcupines and agoutis. Used extensively in scientific research and fur production, its use as a pet has grown exponentially in the last couple of decades, increasing their presence in veterinary clinics and hospitals. Their normal weight varies between 400 and 700 g, with females being typically larger than males. The usual life span in captivity is around 10 years, although some have been reported to live up to 20 years [8].

According to Donnelly the most common health conditions for chinchillas kept as pets are a result of husbandry or dietary deficiencies, and they rarely develop neoplasia; with reports of only 1% of the animals presenting any kind of neoplasia [3]. Although rare, neoplasias do occur in these animals and should be included as differential diagnosis in chinchillas presenting volume increase or masses during examination. There are few reports of mammary gland neoplasia in chinchillas. This report describes the occurrence of mammary adenocarcinoma in a companion chinchilla (Chinchilla laniger) with several metastatic foci in lungs, liver and kidney.

CASE

A 6-year-old female intact domestic pet chinchilla (Chinchilla laniger) was evaluated for progressive hyporexia, apathy, locomotion difficulties and a mass in the axillary region. The patient had a history of parturition two months prior to consultation. The chinchilla was fed commercially available food pellets ad libitum, occasionally leafy green vegetables and had free access to water. The animal was kept in an indoor enclosure with four other chinchillas. Since the owner noted purulent secretion in the ulcerated mass, he began treatment, without veterinarian consent, using topic rifampicin¹, dipyrone¹ (0,5 mL PO q24h) for 5 days and enrofloxacin² (1,5 mL PO q24h) for 5 days. There was no history of other previous health problems. On presentation at the veterinary hospital, the animal, weighing 760 g, was poorly responsive, mildly dehydrated and had moderate body condition. Physical examination revealed pale mucous membranes, body temperature of 36.4°C and an increased volume, soft upon palpation, near inguinal area. The mass in the right axillary region was adhered, soft and ulcerated (Figure 1).

A fine-needle aspiration was performed and the animal was sent home with instructions to perform forced feeding until the citology results were obtained, which were inconclusive. At the owner’s request, no other diagnostic tests were performed. Six days after initial examination, the animal lost 5% of its body weight as anorexy, lethargy and locomotion difficulties progressed, at which point the owner requested euthanasia. The animal was sent for post-mortem examination.

At the time of the necropsy the animal presented great abdominal distention. Gross inspection revealed a slightly firm nodule in the right axillary region measuring 5x5x3 cm, with an area of ulceration of 1 cm in diameter. Another slightly firm nodule of 1 cm in diameter, dark red when cut, was observed in the right inguinal region. The lungs contained multiple soft nodules of 0.3 cm in diameter, white on the surface and dark red when cut, draining moderate amounts of whitish frothy content. In the liver, three well delimited, diffusely white and soft nodules were found, measuring between 0.2 to 0.6 cm in diameter, on the cut surface, the axillary lymph nodes presented multiple yellowish foci measuring 0.3 to 0.8 cm in diameter as we can see in Figure 2a. One of the oviducts contained a fetus in normal development stage and the other showed accentuated amounts of rose-colored paste-like content. There was a whitish nodule in the cortical region of the right kidney measuring 0.3 cm in diameter. No macroscopic alterations were found in other organs.

Histopathological examination of the mammary gland revealed a delimitated and unencapsulated neoplastic proliferation, organized in multiple lobules separated by moderate to severe fibrovascular stroma. Neoplastic cells were arranged in acinar and tubular structures, showing moderate anisokaryosis and anisocytosis, with nuclei ranging from round to oval with one to two evident nucleoli. Cytoplasm was scanty and eosinophilic, with undefined cell borders. Focal areas of coagulative necrosis were present. The epidermis showed moderate irregular diffuse hyperplasia (Figure 2b). Based on these findings, the tumor was characterized as a mammary adenocarcinoma. Metastatic nodules with the same cellular features were found in the lungs (Figure 3), liver (Figure 4) and kidney (Figure 5). The uterus was distended and contained a marked amount of blood clots, fibrin and necrotic debris. There was a moderate amount of trophoblastic cells, distributed diffusely in the endometrium, characterized morpholo-
gically as a site of uterine subinvolution. Other organs did not present any significant histological changes.

**DISCUSSION**

Despite the long life span of chinchillas compared with other rodents, reports of neoplasia are very scarce. It is unknown if this is due to few reports or a low tumor incidence [5] although retrospective studies suggest that chinchillas have a true low frequency of tumors in comparison to rabbits or other rodents [8]. Postmortem examination from over 2000 chinchillas did not list neoplasia as a cause of death [2] and in another study with 325 chinchillas, only 1% of the animals presented any type of neoplasia [3]. Tumors such as neuroblastoma, carcinoma, adenoma of the pituitary gland, lipoma, leiomyoma and hemangioma were listed as occurring in chinchillas [8]. A malignant lymphoma was reported in 1957 with neoplastic cells infiltration in multiple organs [9]. Other types of neoplasia reported in chinchillas include uterine leiomyosarcoma [4], hepatic carcinoma [10], lymphosarcoma and adenocarcinoma of the lung [5], lumbar osteosarcoma [11], carcinoma of the salivary gland [12], infiltrative gastric adenocarcinoma [7]. Neoplasia of the mammary gland has been reported in only three cases out of 300 biopsy and necropsy samples from chinchillas [1], but no further information about metastatic behavior in these animals is available.

Features of malignancy in carcinomas include cellular pilling, variability in cell shape and size and nuclear size with a large and proeminent nucleoli [6], as described in this case. More common in other laboratory animals, mammary carcinoma is frequently seen in rabbits and hormone-responsive tumors such as uterus adenocarcinoma are the most prevalent neoplasia seen in clinical practice in lagomorphs as in practice or laboratory animals and mammary adenocarcinoma is occasionally seen [13].

In other species neoplasms are seen more frequently and in dogs they are clearly hormone dependent [6]. There is scarce data about the cause and incidence of mammary neoplasia among rodent species but a study with ovariectomized rats with 90 days of age revealed the lower incidence of mammary gland tumors (4%) when compared to intact animals (47%) [5] demonstrating that mammary tumors are sensitive to hormone stimuli in this specie. The ovariohysterectomy procedure of young female rodents could decrease the incidence of mammary tumors although this has not been documented in hystricomorph rodents [1], but supports the hypothesis that it could also be the case in chinchillas. In guinea pigs, the common mammary

![Figure 1. Chinchilla (C. laniger) mammary adenocarcinoma (5x5x3 cm) in right axillary region, ulcerated (arrow).](image1)

![Figure 2. Chinchilla (C. laniger) mammary adenocarcinoma. A- Cut surface showing slightly firm, reddish nodule. B- Acinar and tubular pattern proliferation (arrow) [HE, 40x].](image2)
tumor is benign fibroadenoma, but approximately 30% are adenocarcinomas that rarely metastasize [5].

There is limited data about metastatic behavior in chinchillas. In a chinchilla with malignant lymphoma, metastasis was evident in the liver, spleen and kidneys with enlarged lymph nodes [9]. In an infiltrative gastric adenocarcinoma numerous white, irregular plaques and nodules (implantation metastasis) were observed.
on the mesentery, visceral surface of the diaphragm, renal capsule, and uterine serosa [1]. In our report it were found both macro and microscopically, the same cellular patterns in mammary gland, kidney, liver and lungs. With these animals being kept as pets and becoming geriatric patients, it is expected that the number of neoplasias will increase considerably in the future. It is important to considerate adenocarcinoma as a different diagnosis in abdominal volume increase. To the author’s knowledge, this is the first report of a mammary adenocarcinoma with metastatic sites in Chinchilla laniger.

REFERENCES