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## Bronchioloalveolar Carcinoma with Renal and Hepatic Metastases in a Degu (*Octodon degus*)

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**ABSTRACT:** A primary bronchioloalveolar carcinoma with renal and hepatic metastases was diagnosed in a mature male degu (*Octodon degus*) that was found dead in a zoological exhibit (Buffalo Zoological Gardens, Buffalo, New York, USA). Grossly, a discrete 0.5 cm diameter nodule was seen in the lung. Smaller, but similar nodules were present scattered in the liver and kidneys. Histologically, nests and sheets of an infiltrating population of cuboidal to low columnar neoplastic epithelial cells partially effaced pulmonary architecture. Vascular invasion was evident. Similar nests and sheets of neoplastic cells were present within the renal cortex and medulla, and a small nest was present within

the hepatic parenchyma. This is the first record of this neoplasm in a degu.

**Key words:** Bronchioloalveolar carcinoma, renal, hepatic metastases, degu, *Octodon degus*, case report, pathology, neoplasia.

The degu (*Octodon degus*) is a rodent indigenous to South America. It can be found on exhibit in many zoological parks. Limited information on neoplastic disorders in this species has been published. A review article documenting spontaneous lesions in the degu listed seven neoplasms, a reticulum cell sarcoma of a cervical

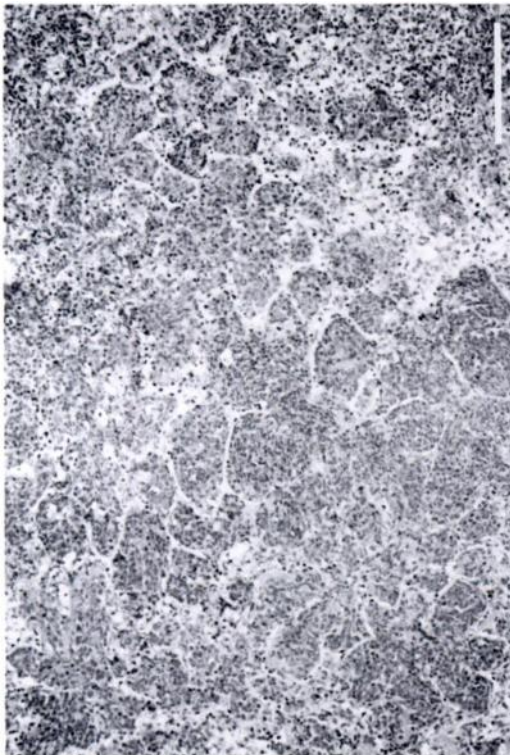


FIGURE 1. Diffuse effacement of pulmonary architecture by an infiltrating population of neoplastic cells forming occasional acini in a degu. Bar = 75  $\mu$ m.

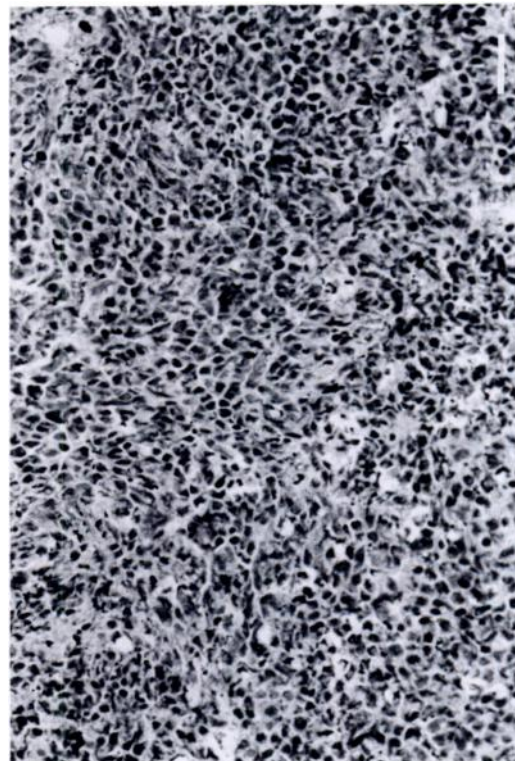


FIGURE 2. Detail photomicrograph of Figure 1 showing histological appearance of neoplastic cells within the pulmonary parenchyma. Bar = 25  $\mu$ m.

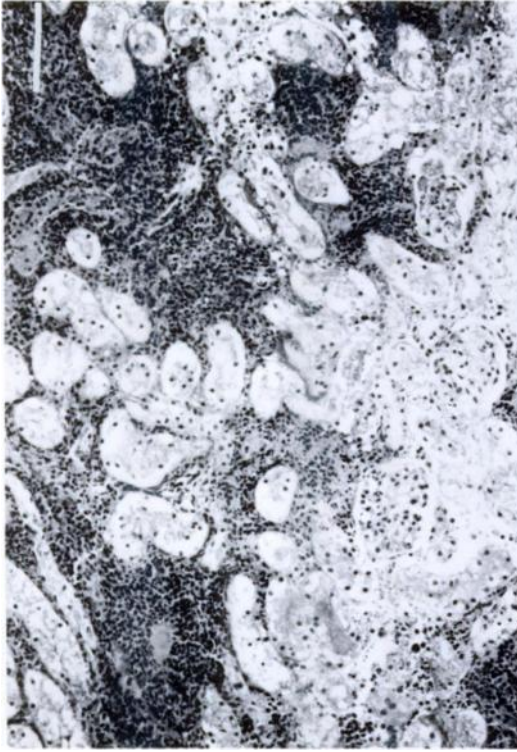


FIGURE 3. Sheets and nests of neoplastic cells infiltrating the renal cortical interstitium in a degu. Bar = 75  $\mu$ m.

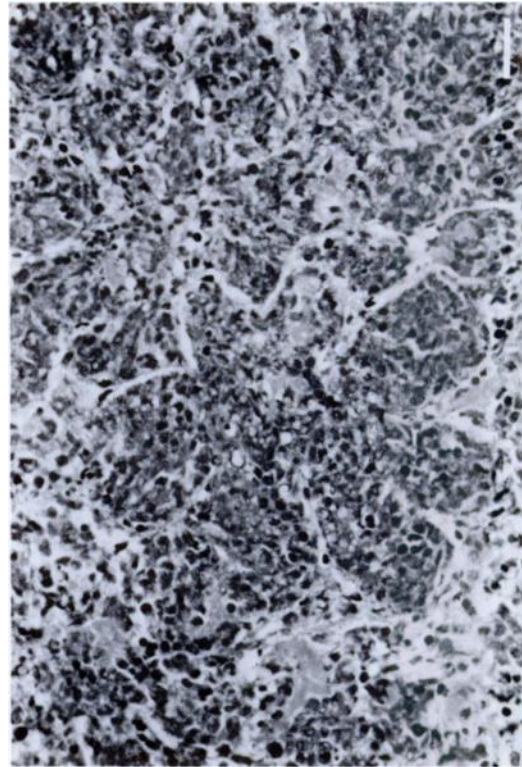


FIGURE 4. Detail of photomicrograph of neoplastic cells from Figure 3. Bar = 25  $\mu$ m.

lymph node, a splenic hemangioma, an abdominal lipoma, two hepatocellular carcinomas (one with renal and pulmonary metastases), and two hepatomas (Murphy et al., 1980). In this same text, a focal pulmonary adenomatous change also was characterized. The present report describes the occurrence of a primary bronchioloalveolar carcinoma with renal and hepatic metastases.

A mature, male degu on exhibit at the Buffalo Zoological Gardens (Buffalo, New York 14214, USA), with no significant previous medical history, was found dead. A necropsy revealed the presence of a 0.5 cm diameter, irregularly-shaped, tan and white nodule within the pulmonary parenchyma. Similar nodules ranging from 0.1 to 0.25 cm in size were scattered within the kidneys and liver. Other gross lesions were not detected. Tissue samples of lung,

liver, kidneys and spleen were fixed in 10% buffered formalin and submitted for histopathological evaluation. Samples were routinely processed, sectioned at 4  $\mu$ m and stained with hematoxylin and eosin.

Histologically, the pulmonary parenchyma was effaced by nests and small sheets of an infiltrating population of low columnar to cuboidal epithelial cells with basophilic cytoplasm and generally indistinct cell boundaries. Nuclei were round and hyperchromatic. Mitotic figures were uncommon. Nests of epithelial cells occasionally formed acini (Figs. 1, 2). Aggregates of similar cells were present within lumina of multiple bronchioles, and vascular invasion was evident. There was multifocal necrosis and hemorrhage within the neoplastic infiltrate. A diagnosis of bronchioloalveolar carcinoma was made. Within the parenchyma of renal cortex



and medulla, there were multifocal to coalescing nests and sheets of a similar population of infiltrating neoplastic epithelial cells (Figs. 3, 4). A single small focus of neoplastic cells was present within a section of liver. The spleen was histologically normal. Representative tissue blocks from this case are deposited in the Registry of Comparative Pathology (Armed Forces Institute of Pathology, Washington, D.C. 20306, USA; Accession Number 2223076).

To our knowledge, the present report represents the first documented case of a bronchioloalveolar carcinoma with renal and hepatic metastases in a degu. Spontaneous pulmonary neoplasms are uncommon in domestic rats and hamsters. Adenocarcinomas of alveolar origin have been described. In guinea pigs, lung tumors are

common. Both papillary adenomas and adenocarcinomas have been documented. Various strains of mice have a high incidence of pulmonary neoplasia; the type II alveolar pneumocyte being the most common cell of origin.

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