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Authors: SNYDER, S. P., DAVIES, R. B., SPRAKER, T. R., and BROWNING, H.

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## EMBRYONAL NEPHROMA IN A WAPITI

S. P. SNYDER,<sup>□</sup> R. B. DAVIES,<sup>□</sup> T. R. SPRAKER<sup>□</sup> and H. BROWNING<sup>□</sup>

**Abstract:** Embryonal nephroma was diagnosed in a young, free-ranging female wapiti (*Cervus canadensis*) from the San Juan National Forest in southwestern Colorado. Metastases were found in the lung.

### INTRODUCTION

Spontaneous neoplasms of free-ranging wapiti, (*Cervus canadensis*) have been reported infrequently. Two cases of osteosarcoma, one mistakenly diagnosed as actinomycosis, have been published.<sup>2,3</sup> A thyroid adenoma was found in a 9 month-old wapiti calf in western Colorado<sup>1</sup> and a round cell sarcoma was reported in an European red deer.<sup>4</sup> Mention of tumors in wapiti was made by Murie,<sup>7</sup> but the gross descriptions suggested that they were abscesses. Neoplasms of elk were not mentioned in a large survey of captive animals at the San Diego Zoological Gardens.<sup>4</sup> This report describes a neoplasm in a young, free-ranging cow wapiti.

### CASE HISTORY

During February, 1976, a rancher repeatedly observed an emaciated 1.5 year-old female wapiti along the Piedra River in the San Juan National Forest of southwestern Colorado. Officials of the Colorado Division of Wildlife and members of the Wild Animal Disease Center at Colorado State University were notified of her condition. On physical examination the animal was thin, weak and had a dull hair coat. She was captured and died *en route* to the University. A necropsy was performed and tissues

were taken for light microscopic examination.

### GROSS FINDINGS

The animal was emaciated. Ribs and pelvic bones protruded and eyes were sunken in their sockets. There was a marked absence of body fat and serous atrophy of fat of the mesenteries, coronary grooves and bone marrow. The abdominal viscera appeared normal with the exception of a large mass occupying the position of the left kidney in the sublumbal region. The mass was soft, coarsely nodular and mottled white to pink. It weighed 6.6 kg and measured 30 × 20 × 15 cm. A portion of the colon was adherent to the mass and there was extensive infiltration of the adjacent retroperitoneal tissue. Remnants of the kidney were found within the mass as were large, irregular brown to red discolored areas of necrosis and hemorrhage (Fig. 1) and small, fluid-filled cysts. Regional lymph nodes were slightly enlarged and red. The right kidney was enlarged, presumably due to compensatory hypertrophy. A cluster of firm white nodules, ranging from 1 to 10 mm in diameter were found in the right diaphragmatic lung lobe. Three adult *Elaeophora schneideri* were found within the right carotid artery, the intima of which was roughened. A

<sup>□</sup> Wild Animal Disease Center, Department of Pathology, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, Colorado 80523, USA.

<sup>□</sup> Colorado Division of Wildlife, Box 76, Chimney Rock, Colorado 81127, USA.

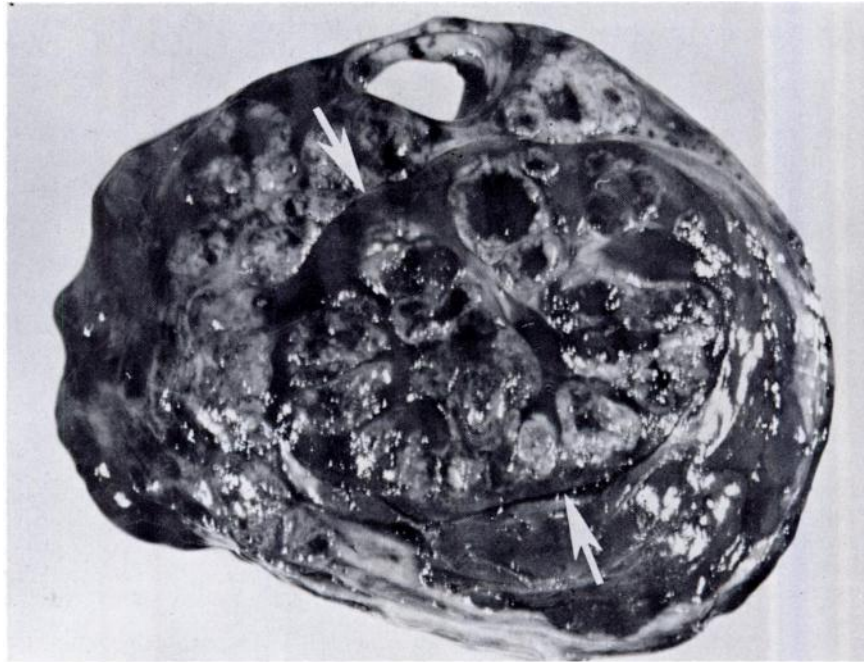


FIGURE 1. Cut surface of neoplasm showing a portion of the left kidney (demarcated by arrows) within the mass.

macerated fetus, judged to be 2 to 2.5 months of age, was found in the right uterine horn.

#### HISTOPATHOLOGY

In most areas the retroperitoneal mass was sharply separated from the surviving renal parenchyma by a dense fibrous capsule. In other areas the capsule was inapparent and neoplastic cells freely invaded the normal renal tissue. The tumor was composed of both epithelial and mesenchymal tissues; the former predominated in most areas of the mass. Likewise, mitotic figures were found in both types of cells and were more numerous in epithelial components. Neoplastic epithelial cells were arranged in clusters of variable-sized, branching tubules. Glomerulus-like structures, formed where tufts of

epithelial cells protruded into tubular lumens (Fig. 2), were seen occasionally. The cells were cuboidal to columnar and each contained a hyperchromatic, round to oval nucleus positioned in the center or towards the base of the cell.

Mesenchymal portions of the neoplasm existed mainly as supporting stroma. In some areas, however, the connective tissue component was more extensive and contained islands of myxomatous, cartilagenous and adipose tissue. Irregular zones of hemorrhage and necrosis were scattered throughout the neoplasm. Centers of necrotic foci were frequently calcified. Although the regional lymph nodes were enlarged and hyperplastic, no neoplastic cells were found within them. The metastatic nodules in the lungs were similar histologically to the primary renal mass.

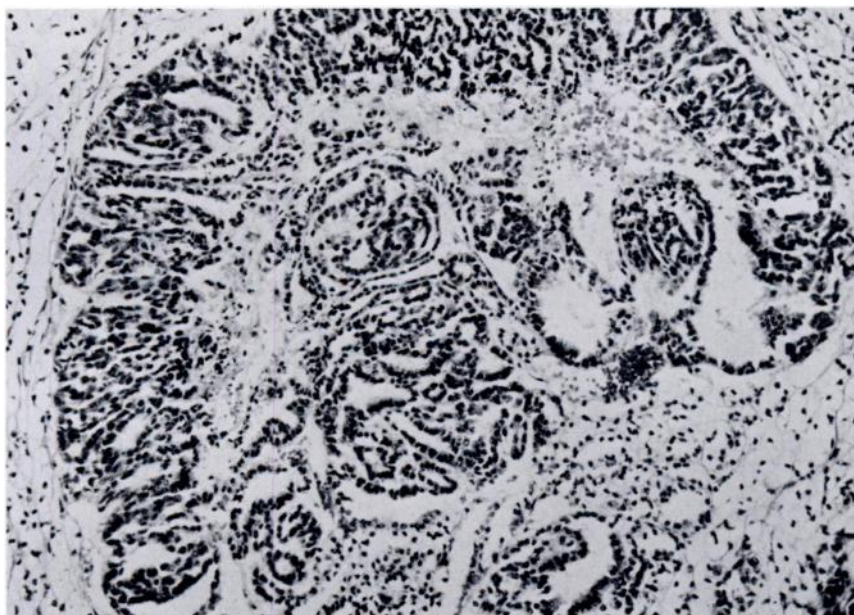


FIGURE 2. Photomicrograph of neoplasm showing tubular and glomerulus-like structures embedded in a myxomatous stroma, H&E  $\times 200$ .

#### DISCUSSION

Embryonal nephroma (Wilm's tumor, nephroblastoma) is an uncommon neoplasm of man and most domestic animals, but occurs frequently in the pig and chicken.<sup>6</sup> It usually affects a younger age group than do other tumors, but may grow so slowly as to not become apparent until the individual is several years old.

The tumor is usually unilateral and enlarges mainly by expansion; metastases are uncommon.

This case closely resembles descriptions of embryonal nephromas of man and domestic animals in gross and microscopic features. To our knowledge, this neoplasm has not been described previously in free-ranging wild cervids.

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