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Nasal Carcinoma in a Captive Eld's Deer

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SUMMARY

A 7-year-old Eld's deer *(Cervus eldii)* developed a swelling rostromedial to the left eye in association with signs of weakness, blindness, and discomfort. By means of radiography and biopsy, the swelling was found to be a carcinoma of lining epithelium of the caudal nasal cavity and left frontal sinus. Within 2 weeks of initial observation, signs of neurologic involvement developed and the deer was euthanatized. Necropsy revealed metastasis to lungs, liver, kidneys, and abdominal lymph nodes.

THERE ARE no published accounts of malignancies of nasal epithelium in wild ruminants. Ethmoturbinate carcinomas of the domestic ruminant have been reported in cattle in Sweden[5,7,9,10] and in sheep in the United States and Germany.[8,11] This is a case report of such a neoplasm in a captive Eld's deer *(Cervus eldii)*.

History and Clinical Findings

A 7-year-old female Eld's deer obtained from the Rangoon Zoo, Burma, had been maintained in a small breeding herd at the National Zoological Park, Washington, DC, for the past 2 years.

Fifteen months after the deer's arrival, it delivered a stillborn calf. Physical examination at that time was unremarkable. Eleven months later the deer began to shiver, became weak, and seemed blind when approached. Discomfort was manifested by persistent vocalization and teeth grinding. A firm 7- by 2-cm swelling rostromedial to the left eye appeared to involve the frontal sinus and surrounding bone. Both pupillary responses were diminished and the left eye had evidence of retinal hemorrhage. Seromucoid fluid (8 ml) was aspirated from the swelling. Results of culture and microscopic examination of the fluid were negative. Initial treatment consisted of antibiotics and corticosteroids.

During the next week the deer developed neurologic deterioration, as indicated by periodic head pushing. Radiography revealed a dense, irregular soft tissue mass occupying the caudal nasal cavity, with obliteration of the normal turbinate architecture and erosion of surrounding bone (Fig 1). Biopsy revealed an anaplastic carcinoma that appeared to originate from lining epithelium of the nasal mucosa.

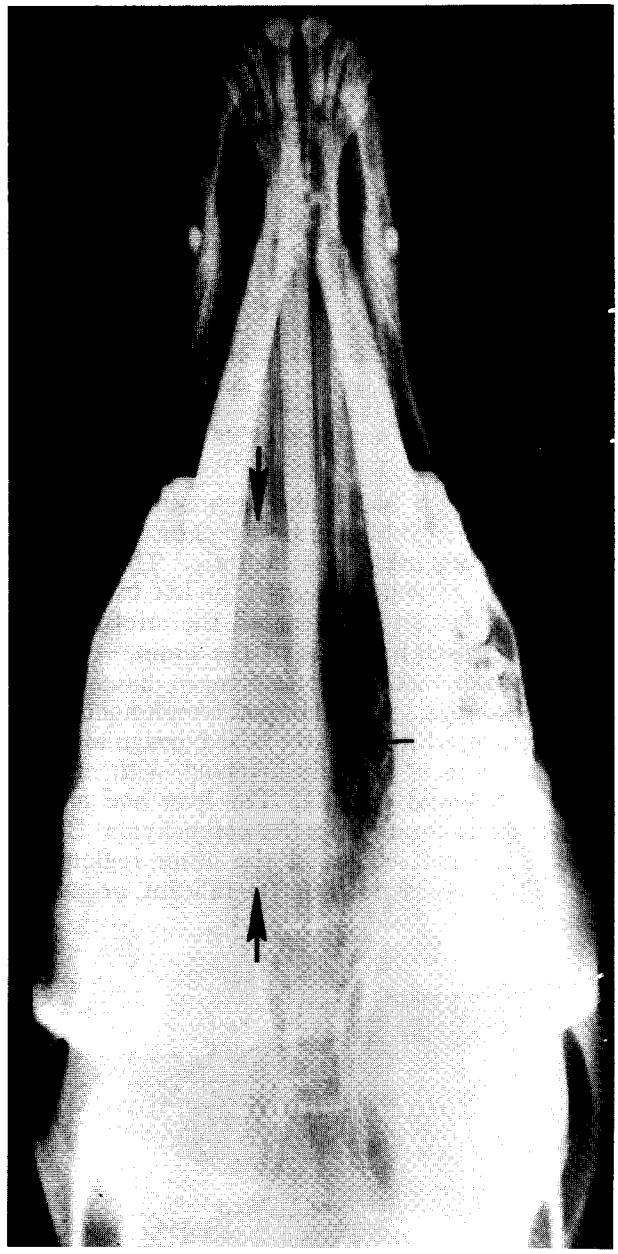

Fig 1—Ventrodorsal radiograph of Eld's deer skull, showing dense mass occupying left caudal nasal passage (arrows), with destruction of ethmoturbinates and erosion and displacement of perpendicular plate of palatine bone.

Five days later the deer was dropping its cud and had a right nasal discharge of rumen contents. The deer was euthanatized and necropsied.

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Necropsy Findings

The deer was thin, having lost 7 kg during the course of the illness. There was a poorly circumscribed mass in the left periorbital region. A midsaggital section through the skull revealed the mass to occupy the caudal respiratory and olfactory portions of the nasal cavity as well as the left frontal sinus. It measured 6 by 4 by 4 cm (Fig 2). The cut surface of the tumor was white

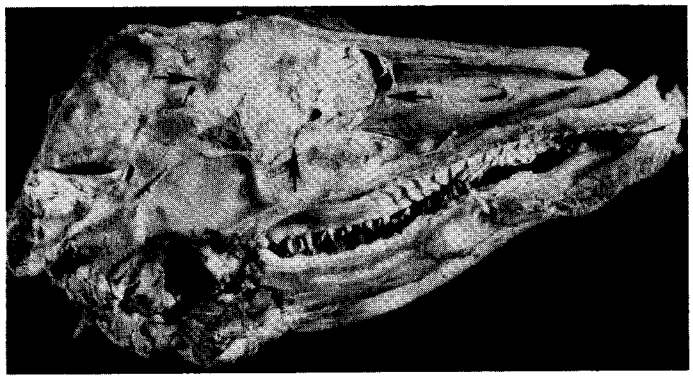

Fig 2—Sagittal section through head, showing neoplasm (arrows) occupying the caudal nasal cavity, with invasion of frontal and nasal bones and penetration of the cribriform plate to involve the brain.

and glistening and it had a fibrous texture. There were several superficial cysts containing clear, mucoid fluid. The center of the mass was necrotic. The highly invasive neoplasm extended through the left frontal, nasal, and lacrimal bones and penetrated the cribriform plate to involve the rostral portion of the brain.

There were metastases up to 3 cm in diameter in the lungs, liver, kidneys, and abdominal lymph nodes. These appeared as firm, white, slightly raised, irregular nodules. The lungs were most severely involved, with most nodules being subpleural (Fig 3). The liver had numerous foci of metastasis throughout the parenchyma. The kidneys had a few metastases in the outer region of the cortices. There were no other significant or pertinent gross findings.

Fig 3—Metastases in lungs. Most metastases are subpleural (lower); a few deeper metastases are on the cut surface (upper).

Fig 4—Photomicrograph of primary tumor. Notice cords of invading malignant epithelial cells, with displacement and necrosis of brain tissue. H&E stain; × 150.

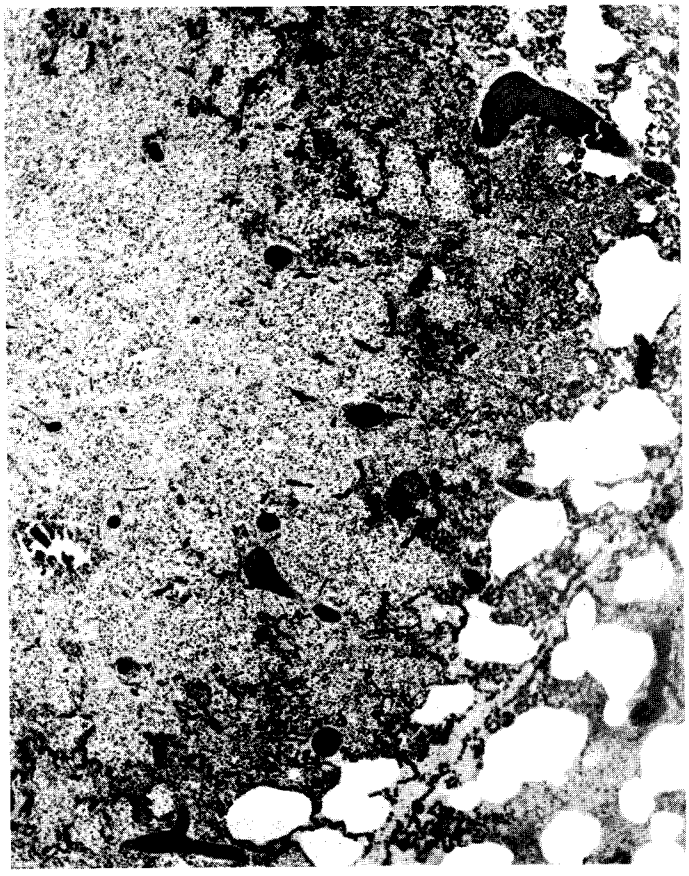

Fig 5—Photomicrograph of metastatic tumor in lung. Notice marked sclerosis in the center. H&E stain; × 60.

Histopathologic Findings

The neoplasm in the nasal cavity consisted of invasive nests and cords of poorly differentiated epithelial cells within dense collagenous stroma (Fig 4). There were areas that suggested transition from respiratory epithelium to tumor but in situ changes in the mucosa could not be demonstrated. Some of the cells contained cytoplasmic vacuoles and small amounts of periodic acid-Schiff-positive material, but did not react with other mucin stains. Metastatic sites were similar morphologically, although they were more sclerotic, especially in the lungs (Fig 5).

Discussion

Carcinomas of the nasal epithelium in man and lower animals are often highly malignant and tend to metastasize rapidly.[1,6] The rapid progression of clinical signs over a 2-week period in this deer reflects this tendency.

The advanced state of the tumor at the time of necropsy made the precise site of origin impossible to determine. This problem has been encountered in canine nasal tumors and reflects the insidious intranasal development.[2-4] These tumors tend to be far advanced before they are recognized clinically.

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