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NASAL TUMOR IN A FALLOW DEER (DAMA DAMA L)

A CASE REPORT

By

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STEEN, M., C. REHBINDER and T. MÖRNER: *Nasal tumor in a fallow deer (Dama dama L). — A case report.* Acta vet. scand 1985, *26*, 461—465. — A nasal, so called ethmoidal, tumor from a fallow deer is described. It appears to be the first reported case of that species. The etiology is discussed.

ethmoidal; etiology; wild-life; comparative pathology.

Neoplasms of the nasal cavity in cervidae, arising from regio olfactoria covering the ethmoid bones, have been reported from moose (*Borg* 1975) and in rare instances in roe deer (Capreolus capreolus L) (*Borg & Nilsson* to be published).

Only one report on nasal neoplasms from other cervidae than moose and roe deer have been found by the authors; a spotted deer found in Kerala, India (*Anon.* 1980). The objective of the present investigation was to describe a case of a nasal tumor, arising from the olfactory mucosa, in a fallow deer, being the apparently first reported case of that species.

MATERIAL AND METHODS

The animal was killed by a hunter, because of abnormal behaviour, i.e. it did not notice people even at a close distance. It was found grazing in an oat-field but did not react when approached. In addition it appeared to be in a poor condition.

The material obtained consisted of a head with a large swelling over the nasal cavities and frontal sinuses on the left side. The animal was a female, 10½ years old. Age was determined by means of dental wear.

The head was cut longitudinally with a saw and macroscopically inspected.

For microscopy several pieces of tissues were taken and were fixed in 4 % formalin, embedded in paraffin, cut in 4 µm thick sections and stained with haematoxylin-eosin van Gieson, Gomori and Holmes stains.

Bacteriological samples were also obtained.

RESULTS

The animal had a large subcutaneous mass on the left side of the forehead also involving the area of the eye partly embedding it. Sagittal sections of the skull revealed grayish, mottled, rather soft masses extending from the region of the ethmoid bone mostly anteriorly invading the retrobulbar area and posteriorly penetrating and destroying the cribriform plate invading the cranial cavity and compressing the cerebrum of the left side (Figs. 1 & 2). The masses showed considerable areas of necrosis and suppuration indicative of a bacterial infection. The results of the bacteriological investigation revealed a rich growth of Fusobacterium necrophorum from tissue masses in the nasal cavities and a moderate growth of Corynebacterium pyogenes in the mass invading the cranial cavity.

The microscopical investigation revealed two distinct types of tumors, both with invasive growth. Parts of the tumor mass was characterized by rather uniform spindle shaped cells, in the arrangement of which could be distinguished rudimentary palisades, a tendency to rosette formation and lack of fish-bone structure. This tumor was considered a malignant Schwannoma (Fig. 3). Inother parts of the tumor mass consisted of sheets of rather immature epithelial cells surrounded by a vascularized fibrous stroma partly with an almost papilliferous appearance. This tumor was considered a carcinoma (Fig. 4).

DISCUSSION

Enzootic nasal tumors in cattle arising from the olfactory mucosa, and referred to as ethmoidal tumors, have been reported in Sweden as an endemic condition already 1909 by *Stenström*. Today cattle in Sweden are not reported to suffer from this condition while *Borg & Nilsson* (to be published) reported on 35 cases in moose and 4 in roe deer during the period 1947—82.

Figure 1. External view of fallow deer head. Note tumor masses surrounding the left eye.

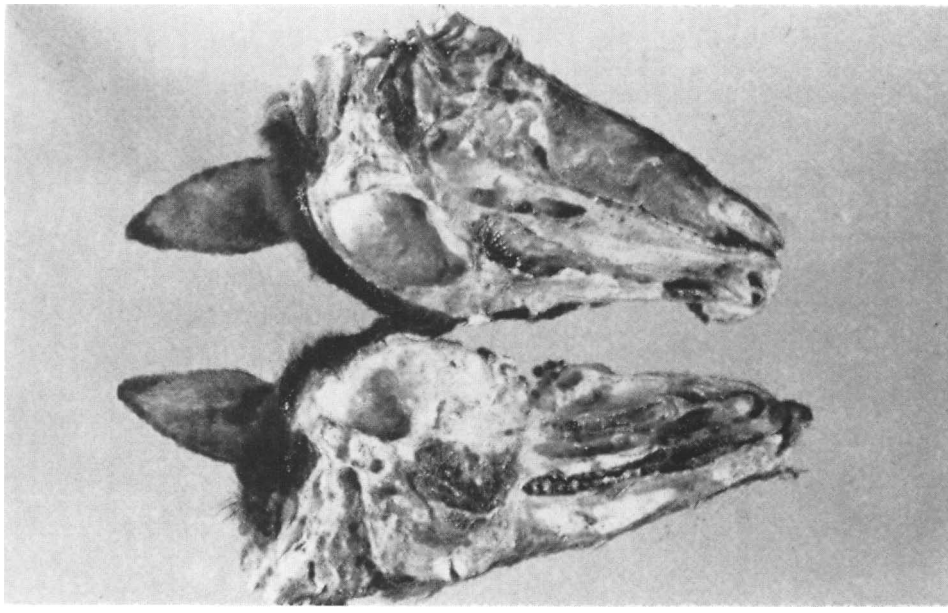

Figure 2. Tumor masses in the nasal cavities of fallow deer. Note compression of the brain on the left side and the penetration of the frontal bones.

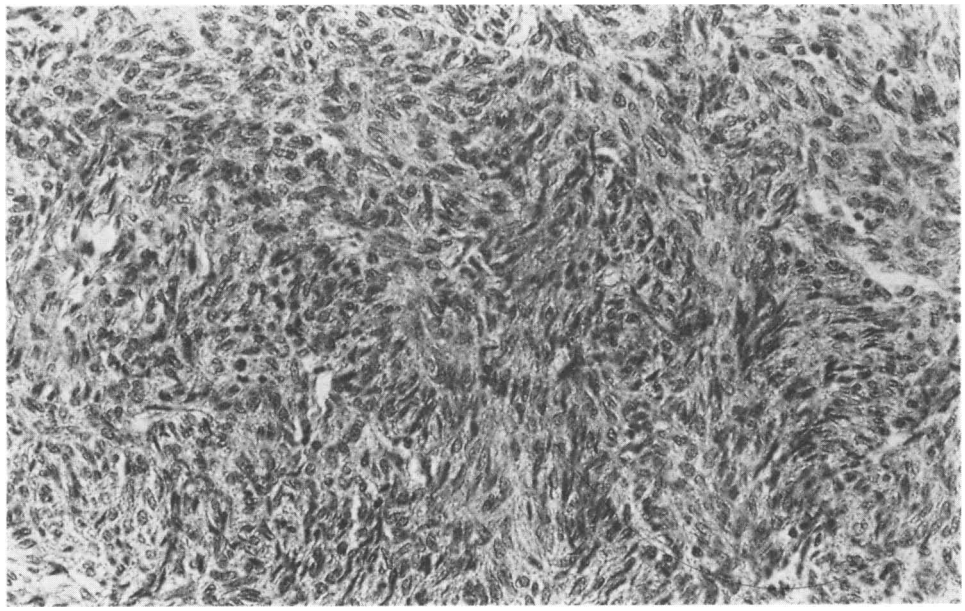

Figure 3. Tumor from fallow deer characterized by rather uniform spindle shaped cells. Note tendency to palisades. Holmes x 280.

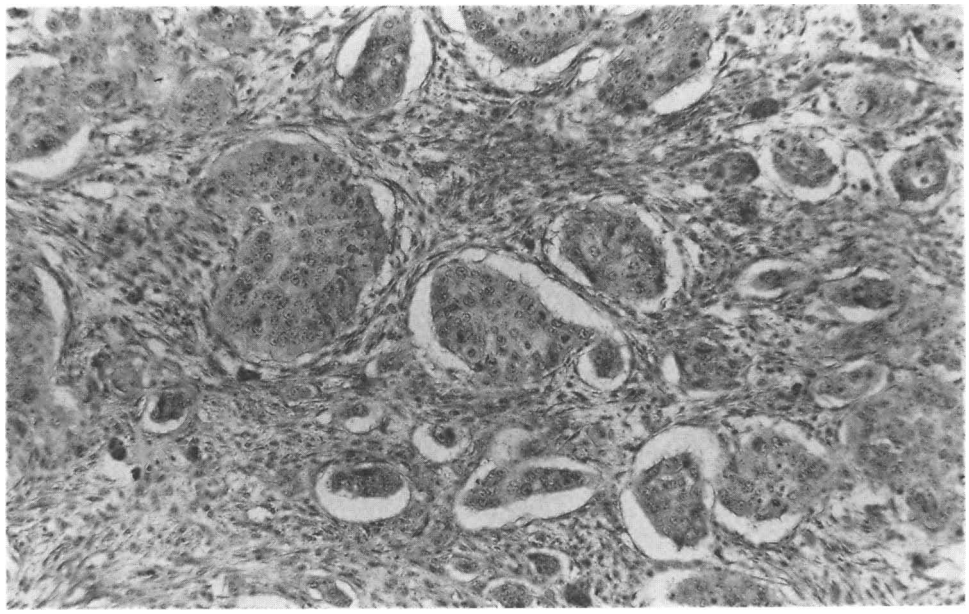

Figure 4. Tumor from fallow deer consisting of immature epithelial cells surrounded by fibrous stroma. HE x 110.

Nasal tumors are rare but known from man (*Heffner* 1983) and from many domestic animals as dog and cat (*Madewell et al.* 1976, *Patnaik* 1983) and horse, cattle, buffaloe, goat, sheep, and pig (*Rajan et al.* 1972, *Njoku & Chineme* 1983). In cattle reports on endemic or enzootic tumors have originated from many parts of the world including Hongkong, India, South Africa, Switzerland, Portugal, Brazil, and Dominican Republic. In sheep ethmoidal tumors are said to constitute a specific disease. Epizootics of ethmoidal tumors in sheep have been reported from France, Germany, Brazil, Japan, Ghana, Nigeria, South Africa, USA, Canada, and India (*Duncan et al.* 1967, *Rajan et al.* 1972, *Njoku & Chineme* 1983).

Concerning the histopathologic classification a variety of different tumor types have been diagnosed. In cattle and sheep are reported, however, mainly three types; adenocarcinoma, undifferentiated carcinoma and squamous cell carcinom. Also in moose a variety of different tumors, carcinomas and sarcomas have been diagnosed, the only common feature being immaturity (*Borg & Nilssen* to be published). Most probably the case of the fallow deer is a collision tumor. Concerning ethmoidal tumors in moose and roe deer the authors have only found reports from Sweden. The only reported case found from another cervidae species is from a spotted deer (Axis axis) in Kerala, India (*Anon.* 1980). It thus seems possible that cervidae in Sweden may carry the disease while it since long ha been eradicated in domestic ruminants. It is possible that changed husbandry and grazing condition, i.e. livestock is no longer grazing in forests, is the major factor why the disease has disappeared in domestic ruminants. The more pronounced prevalence in moose compared to that of roe deer indicates that moose is more susceptible to the disease than roe deer as in the middle of Sweden, from which area most of the cases in moose emanate (*Borg & Nilsson* to be published), the number and density of roe deer has to be considered higher than that of moose. The incidental finding of an ethmoidal tumor in a fallow deer may suggest a lower susceptibility than in moose but may solely depend upon the fact that wild fallow deer are not numerous in Sweden.

In moose all affected animals were middle-aged or old females while in roe deer middle-aged and old males and females were found (*Borg & Nilsson* to be published).

The sex disposition seen in moose is not found in other ru-

minants (*Rajan et al.* 1972, *Madewell et al.* 1976, *Njoku & Chineme* 1983).

The etiology of the disease is still obscure. The epidemiological features of these neoplasms are suggestive of an infectious agent (*Nair et al.* 1981). *Cohrs* (1952, 1953) without isolating virus was able to reproduce the disease in sheep by intranasal instillation of cellfree aqueous extracts of emulsified tumor. *Yonemichi et al.* (1978) found virusparticles, indistinguishable from visnamaedi-virus, in ethmoid tumors of sheep. However, in sheep differently from other ruminants including moose (*Borg* 1975), the development of nasal tumors is not correlated with age (*Njoku & Chineme* 1983). In cattle *Sulochana et al.* (1980) were able to isolate haemagglutinating agents from ethmoid tumor tissues of India cattle. Also in material from Indian cattle *Nair et al.* (1981) found budding virus particles without being able to determine its etiological role. The possibility of virus, solely or as a factor in a multifactorial genesis, mycotoixns (*Lewis et al.* 1967) or other factors, has to be considered in all affected species.

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SAMMANFATTNING

Nästumör hos en dovhjort (Dama dama L). Fallbeskrivning

En nästumör, s k ethmoidaltumör, hos en dovhjort beskrives. Det beskrivna fallet synes vara det först rapporterade från denna hjortart. Etiologin diskuteras.

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