

## Uterine Leiomyosarcoma in a Sambar Deer (*Cervus Unicolor*)

**D.Basheer Ahamad<sup>1\*</sup>, Shagufta Azmi, M.S.Bhadwal, C.Balachandran<sup>2</sup>, B.Puvarajan<sup>2</sup>,  
Shilpa Sood and Nawab Nashirullah**

<sup>1</sup>Division of Veterinary Pathology

Faculty of Veterinary Sciences & Animal Husbandry (F.V.Sc & AH)

Sher-e- Kashmir University of Agricultural Sciences & Technology- Jammu (SKUAST-J)

R.S.Pura 181 102. Jammu

<sup>2</sup>Tamil Nadu Veterinary and Animal Sciences University, Chennai

### Abstract

*Tumours of the female genital system are rarely reported in Sambar deer. The present paper reports a case of uterine leiomyosarcoma in a 7 years old Sambar deer. The deer was treated for several months for anorexia and debilitation. The deer was never conceived during her stay in Mini Zoo, Manda, Jammu and was found dead. At necropsy, lungs, liver, spleen revealed moderate congestion but the kidneys showed severe paleness. The uterus showed diffuse solid growth from the cervix and body of the uterus and weighing approximately 3.450 Kg. The lumen of the uterus was unable to locate. The growth was diffuse pinkish and fleshy. On cytopathological examination, the nucleus of the cells were anisokaryosis. On histopathological examination, the growth revealed leiomyosarcomas exhibit cellular atypia, strap like smooth muscle fibre to anaplastic round cells and a relatively high mitotic index. The cytoplasm of leiomyosarcoma cells tends to be more eosinophilic and abundant and can have a bubbly or vacuolar appearance. The mitotic figure index was 2.45+ -0.75/phf. Based on gross and histopathological changes, growth in the uterus was diagnosed as the uterine leiomyosarcoma in Sambar deer.*

### Introduction

Uterine neoplasm is rare among deer (Robert and Posthaus, 1999; Duncan *et al.*, 2007) among domestic animals; uterine leiomyosarcoma is recorded in Holstein Frisian cow and goat (Noordsy *et al.*, 1973; Ryan 1980). Leiomyosarcomas are malignant neoplasms of smooth muscle cell origin. Morphologic features of this neoplasm that support the diagnosis include the arrangement of interlacing fascicles or bundles of spindle-shaped cells occurring in both long and transverse section and often forming a herringbone pattern. Typical cytologic features include cells which resemble smooth muscle with a moderate amount of eosinophilic, fibrillar cytoplasm and elongate, oval nuclei with characteristic blunt ends (Moulton, 1990). Among wild animals, a large mesenteric leiomyosarcoma tumour in a Rusa hind (*Cervus timoriensis*) was diagnosed on the basis of tumour size, degree of necrosis, cellular pleomorphism, anaplasia, mitotic activity and evidence of local invasion. The present report describes about a case of uterine leiomyosarcoma in a Indian Sambar deer (*Cervus unicolor*).

---

\*Email: dbahamad@gmail.com

### Materials and Methods

A 7 years old captive Indian Sambar deer was maintained at Mini Zoo, Manda, Jammu. The animal was treated for several months for anorexia and debilitation.

There was only abdominal distension, general weakness and emaciation (Fig. 1) because of its huge volume but not any general symptoms and suspected for the pregnancy.



**Fig.1: Indian Sambar deer with abdominal distension, general weakness and emaciation**

The deer was never conceived during her stay in the zoo and it was found dead. At necropsy, the carcass was examined externally and internally. Gross lesions in all vital organs were recorded. The cytological impression smear was also taken from the growth and stained with Leishman's staining. Representative tissues samples from the vital organs including lymph nodes were collected for histopathological studies with H&E staining. Additional sections were stained with Masson's Trichrome connective tissue stain (Luna, 1966).

### Results and Discussion

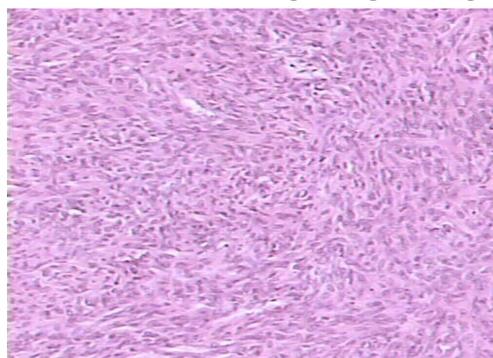
In the present study, there was abdominal distension, dyspnea and general dullness because of the huge volume of the

neoplastic growth mass. The uterus showed diffuse solid growth from the cervix to the horns of the uterus measuring 14 cm in diameter and weighing approximately 3.450 Kg (Fig.2). The lumen of the uterus was unable to locate.



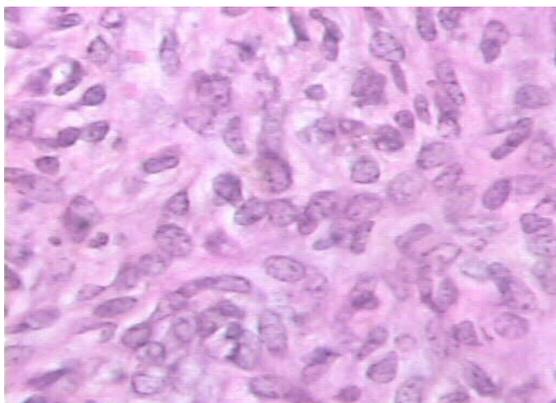
**Fig.2: The uterus of deer showed diffuse solid growth from the cervix to the horns of the uterus.**

The growth was diffusing pinkish and fleshy. On cytopathological examination, the neoplastic cells showed anisokaryosis. On histopathological examination, the growth consisted of interlacing bundles of spindle-shaped to strap-like cells with a tendency for the bundles to intersect at right angles (Fig. 3).



**Fig.3: Uterine leiomyosarcoma consisted of interlacing bundles of spindle-shaped to strap-like cells with a tendency for the bundles to intersect at right angles H&E100X**

These cells were characterised by distinctive cigar-shaped, centrally placed nuclei. There were areas of marked cellular pleomorphism with anaplastic stellate or round cells (Fig. 4) and substantial numbers of a few multinucleate giant cells.



**Fig.4: Uterine leiomyosarcoma: Distinctive pleomorphic cells with vesicular nuclei H&E X 400**

The anisokaryosis of the neoplastic cells showed variation in size of nuclei with large to small round cells with hyperchromatic nuclei and scant cytoplasm. The nucleus showed multiple nucleoli. A few mitotic figures were frequent. The mitotic figure index was 2.45+/- 0.75/phf. Collagenous fibrous stroma was minimal. Masson's Trichrome connective tissue stain revealed collagen bundles in the tumour area. Histopathologically, a well-differentiated leiomyosarcoma was diagnosed.

Neoplasms of the female genital system especially uterine tumors are rarely reported in deer. Robert and Posthaus, (1999) reported uterine adenocarcinoma in a 4-year-old captive sika deer that had a focal uterine mass with peritoneal carcinomatosis and metastases to the lung, liver, spleen, urinary bladder,

lymph nodes, diaphragm, and muscular layers of the forestomachs. Soft tissue tumours comprised a group of proliferative lesions arising from mesenchymal cells. In the present study, a little collagenous fibrous stroma, interlacing bundles of spindle-shaped to strap-like cells with a tendency for the bundles to intersect at right angles, a few mitotic figure with poikilocaryosis such as spindle, round, oval shaped cells, lack of either vascular or lymphatic invasion by neoplastic cells and mildly infiltrative neoplastic cells along the tumour's margins favor a diagnosis of leiomyosarcoma over leiomyoma. Metastases to regional lymph nodes were not identified. Leiomyosarcomas are slow-growing malignant tumours of smooth muscle origin found primarily in the liver, spleen, caecum, small intestine, as well as in the bladder, uterus and deep soft dogs (Kapatkin *et al.*, 1992). Mitchell (1982) recorded a large mesenteric tumour a leiomyosarcoma, in a Rusa hind (*Cervus timoriensis*) was diagnosed as on the basis of tumour size, degree of necrosis, cellular pleomorphism, anaplasia, mitotic activity and evidence of local invasion. Rupture of the tumour and consequent haemorrhage was the immediate cause of death. This malignant neoplasm showed extensive areas of necrosis and haemorrhage, high cellularity, marked pleomorphism, atypical giant cells and numerous mitoses with occasional abnormal figures (Hanzaike *et al.*, 1995). Among the domestic animals, tumour incidence in retrospective study showed a lower incidence of bovine genital smooth muscle tumors. A report of a tumor incidence from an abattoir survey,

encompassing more than one million animals, found five smooth muscle tumors among 302 genital tumors. Among 2,408 genital neoplasms in cows documented within a literature review included in the same paper, 10 were smooth muscle tumors, 3 of which were considered malignant (Anderson and Sandison, 1969). Whitney *et al.* (2000) observed Saanen breed goats predisposition for caprine genital leiomyosarcoma and diagnosis in two sibling does. Several heritable mechanisms of increased neoplastic susceptibility offer explanations for apparent breed related tumors. Increased incidence of an oncogene or tumor suppressor mutation within an inbred animal population can affect rate of tumorigenesis. Uterine leiomyosarcoma is rare tumors of domestic and wild animals and previously unreported in elk. The spontaneous uterine leiomyosarcoma in captive Sambar deer (*Cervus unicolor*) is reported

### References

- Anderson, J.L. and Sandison, A.T. 1969. Tumours of the female genitalia in cattle, sheep and pigs found in a British abattoir survey. *J. Comp. Pathol.* **79**: 53–63.
- Duncan, C., Powers, J., Davis, T. and Spraker, T. 2007. Abomasal and uterine adenocarcinomas with ovarian metastasis in a captive elk (*Cervus elaphus nelsoni*). *J. Vet. Diagn. Invest.* **19**(5):560.
- Hanzaike, T., Ito, I., Ishikawa, T., Ishikawa, Y. and Kadota, K. 1995. Leiomyosarcoma of soft tissue in a cow. *J. Comp Pathol.* **112**(3): 237.
- Kapatkin, A.S., Mullen, H.S. and Mathiessen, D.T. 1992. Leiomyosarcoma in dogs: 44 cases (1983–1988). *J. Americ. Vet. Med. Assoc.* **7**: 1077.
- Luna, L.G. 1966. Manual of histologic staining methods of the Armed Forces Institute of Pathology, 3rd ed. Bannerstone House, Springfield, Illinois, pp. 94-95.
- Mitchell, G. 1982. Leiomyosarcoma and perirenal osseous metaplasia in a Rusa hind (*Cervus timoriensis*). *J. Wildl. Dis.*, **18**(1): 95.
- Moulton, J.E. 1990. *Tumors in Domestic Animals*, 3rd ed. University of California Press, Berkeley.
- Noordsy, J.L., Leipold, H.W., Cook, J.E. and Downing, C.W. 1973. Leiomyosarcoma of the uterus in a Holstein cow (a case report). *Vet. Med Small Anim Clin.* **68**(2): 176.
- Robert, N and Posthaus, H. 1999. Uterine adenocarcinoma in a captive sika deer. *J. Wildl. Dis.* **35**(1): 141.
- Ryan, M.J. 1980. Leiomyosarcoma of the uterus in a goat. *Vet. Pathol.*, **17**: 389–390.
- Whitney, K.M., Valentine, B.A. and Schlafer, D.H. 2000. Caprine genital leiomyosarcoma. *Vet. Pathol.* **37**: 89–94.