

Primary vaginal fibroleiomyosarcoma in a 4-year-old Holstein-Friesian cow

Hamdi AVCI^{1,*}, Güneş SERİN², Ahmet AYDOĞAN¹, Serap BİRİNCİOĞLU¹

¹Department of Pathology, Faculty of Veterinary Medicine, Adnan Menderes University, 09016 Aydın - TURKEY

²Department of Obstetrics and Reproductive Diseases, Faculty of Veterinary Medicine, Adnan Menderes University, 09016 Aydın - TURKEY

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Abstract: A case of fibroleiomyosarcoma of the vagina in a 4-year-old Holstein-Friesian cow is described. The tumour was 6.5 × 5 × 4.2 cm in size, weighed 87.73 g, and had a solid appearance. Histologically, the tumour was composed of smooth muscle and fibrous tissue components with spindle-shaped cells with eosinophilic fibrillary cytoplasm. Immunohistochemically, the tumour cells reacted with antibodies to α-SMA, desmin, and vimentin but not with antibodies to CD34, CD68, and S-100 protein. Both histologically and immunohistochemically it showed the features of a fibroleiomyosarcoma.

Key words: Cow, fibroleiomyosarcoma, immunohistochemistry, vagina

Dört yaşlı Siyah-Alaca ırkı bir sığırda vaginal fibroleiyomiyosarkom

Özet: Bu çalışmada, dört yaşlı Siyah-Alaca bir sığırda, vaginal fibroleiyomiyosarkom olgusu tanımlandı. Solid yapılı tümöral kitle 6,5 × 5 × 4,2 cm boyutlarında ve 87,73 g ağırlığında idi. Histopatolojik olarak, tümör dokusunun eozinofilik sitoplazmalı, iğ şekilli kas ve bağ doku hücrelerinden oluştuğu görüldü. İmmunohistokimyasal incelemede; tümör hücreleri, α-SMA, desmin ve vimentin antikorları ile pozitif, CD34, CD68 ve S-100 antikorları ile negatif boyandı. Olgu, histopatolojik ve immunohistokimyasal bulgulara göre fibroleiyomiyosarkom olarak tanımlandı.

Anahtar sözcükler: Sığır, fibroleiyomiyosarkom, immunohistokimya, vagina

Introduction

A variety of primary malign vaginal tumours including leiomyosarcoma and fibrosarcoma are described in domestic animals (1-5). Leiomyosarcomas are one of the most common types of vaginal sarcomas (1,4-6). Fibrosarcomas are less commonly observed than leiomyosarcomas (5,7-9); other malignant vaginal tumours occur rarely in

animal species (2,5,7). In animals a few reports of spontaneous fibroleiomyoma have been described (10-12) but there have been no previous reports of a fibroleiomyosarcoma arising from the vagina or other parts of the genital tract of animals.

The tumour in the present case arose from the vagina, and is the first case of a fibroleiomyosarcoma reported in Holstein-Friesian cows.

* E-mail: havci@adu.edu.tr

Case history

A 4-year-old female Holstein-Friesian cow at around 110-120 days postpartum was admitted to the Department of Obstetrics and Reproductive Disease, Faculty of Veterinary Medicine, Adnan Menderes University, with a history of difficulty in artificial insemination. The cow was in first oestrus and suffering from intermittent vulvar haemorrhage since the finishing of the lochia. The cow was clinically examined by rectal palpation and introducing a vaginal speculum. A round, firm mass at the dorsal vaginal wall was determined, and no lesions were found in the other genital tracts of the cow. For treatment, the vaginal mass was removed surgically under epidural anaesthesia, and postoperatively antibacterial therapy was applied with a penicillin-streptomycin combination daily for 3 days.

For histologic evaluation, tissue samples taken from the mass were fixed in 10% neutral buffered formalin, embedded in paraffin, sectioned at 5 µm, and stained with haematoxylin and eosin (H&E), Masson's trichrome, and van Gieson's stains. The selected sections were used for immunohistochemical staining in order to determine the cellular origin of the tumour.

For immunohistochemistry, the avidin biotin-peroxidase complex (ABC) method was used with primary antibodies to mouse anti-human alpha smooth muscle actin (α -SMA) (Dako), mouse anti-vimentin (Dako), mouse anti-human desmin (Dako),

S-100 protein (Novocastra), CD34 (Dako), and CD68 (Dako). Serial sections (5 µm) were placed on poly-L-lysine (Sigma) coated slides. Following incubation for 12 h at 37 °C, sections were deparaffinized with xylene, and rehydrated through graded ethanol and pretreatment with protease. Endogenous peroxidase activity was blocked by incubation with 3% H₂O₂/methanol. To reduce nonspecific staining, the sections were incubated with 5% normal goat serum before exposure to primary antisera. After the sections were incubated with the primary antibodies overnight at 4 °C in a humidified chamber, slides were washed with phosphate-buffered saline (PBS) and were incubated with the biotinylated secondary antibody for 30 min at room temperature in a humidified chamber. The sections were then rinsed with PBS, and reacted with streptavidin-peroxidase conjugate for 30 min. After the slides were washed with PBS, they were treated with the substrate chromogen (3,3'-diaminobenzidine, DAKO), counterstained with Mayer's haematoxylin, dehydrated, and mounted in a synthetic medium.

Results and discussion

On gross examination, the vaginal mass was well demarcated, nonencapsulated, and could be protruded from the vulva (Figure 1A). It measured 6.5 × 5 × 4.2 cm and weighed 87.7 g. On cross-section it was solid, smooth, and firm with a homogeneous greyish white colour (Figure 1B).

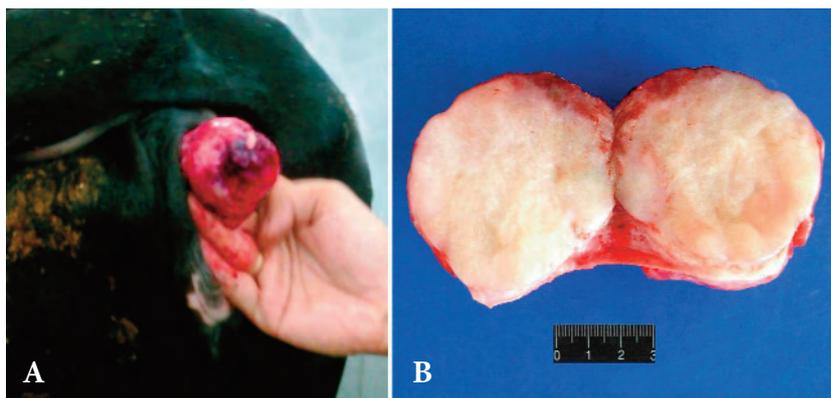


Figure 1. A. Appearance of the tumour at presentation. The mass was located at the dorsal vaginal wall and protruded through the vulva. B. The cut surface of the tumour was smooth and homogeneous greyish white.

Histologically, the tumour was composed primarily of spindle-shaped cells with fibrillary eosinophilic cytoplasm (Figure 2A) and basophilic nuclei with cell atypism (Figure 2B). These cells had fusiform, round, or elongate euchromatic nuclei with 1-3 clear nucleoli and moderate mitotic activity (2-3 mitoses per 40× power field) was observed together with binucleated or multinucleated giant cell and mononuclear cell infiltrations including lymphocytes. The cytoplasm of the spindle-shaped cells was composed of muscle fibrils and collagen visible with Masson's trichrome and van Gieson's stains.

Immunohistochemically the cells had strong positive immunoreactivity for α -SMA (Figure 3A) and desmin (Figure 3B). Vimentin positivity was also observed in some of the neoplastic cells (Figure 4). No labelling was observed with antibody to CD34, CD68, or S-100. Positive immunoreactivity was also observed in the vascular structures of the tumour sections, which were used as positive internal controls for the above antibodies.

Based on these histopathological and immunohistochemical results fibroleiomyosarcoma was diagnosed. However, 6 months after surgery, the

owner reported that there had been no recurrence of vulvar discharge or bleeding, and the cow appeared clinically normal.

Leiomyosarcoma and fibrosarcoma are the most commonly reported tumours of the vagina (1,2,4-8). Classification of both tumours is based on their tissue components; if the tumour is composed of smooth muscle cells, it is classified as leiomyosarcoma (1,5,7), and if it is composed of fibrous tissue, it is identified as fibrosarcoma (5,7-9). In this report, van Gieson's and Masson's trichrome staining and immunohistochemical labelling of α -SMA, desmin, and vimentin together with the use of other antibodies were used to further identify this tumour. Based on histopathological and immunohistochemical findings the tumour was described as fibroleiomyosarcoma, which consists of both smooth muscle and fibrous tissues components with increased cellular pleomorphism and atypia, and mitotic activity. To our knowledge, spontaneous uterine or vaginal fibroleiomyoma has been reported in animals (10-12) but fibroleiomyosarcoma has not been described previously in cows or other animals. Some authors have suggested that in these tumours if

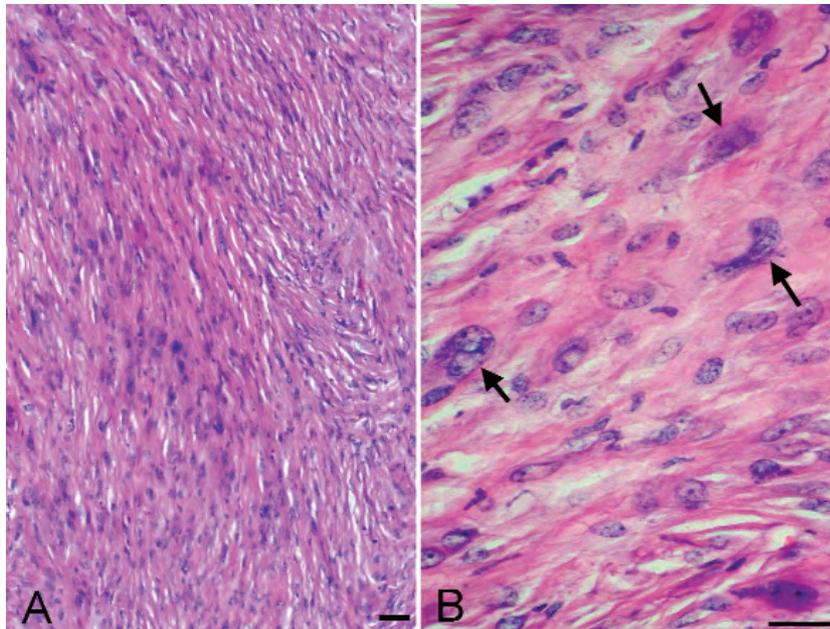


Figure 2. A. The tumour is composed of spindle-shaped cells. H&E. Bar = 50 μ m
B. Many of the tumour cells showed cellular pleomorphism and atypia (arrows). H&E. Bar = 30 μ m.

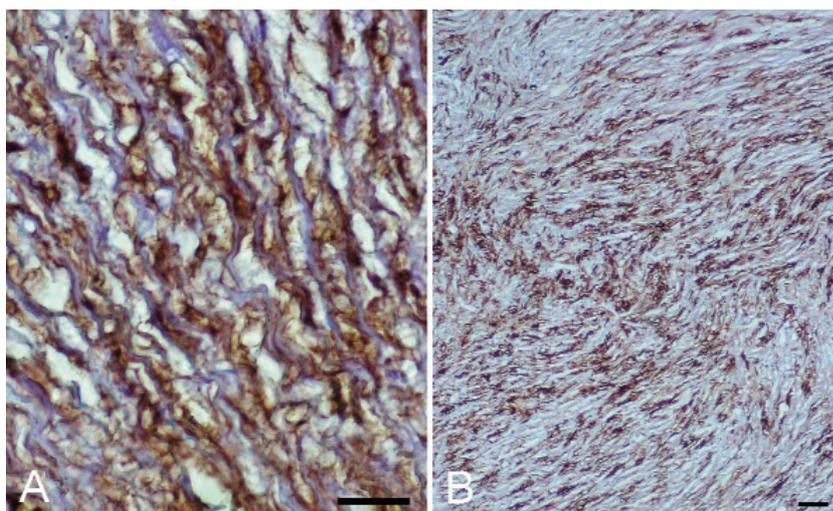


Figure 3. A. Immunoperoxidase labelling with antibody to α -smooth muscle actin, Avidin-biotin peroxidase complex method, Haematoxylin counterstain. Bar = 30 μ m, B. Immunoperoxidase labelling with antibody to desmin. Avidin-biotin peroxidase complex method, Haematoxylin counterstain. Bar = 50 μ m.

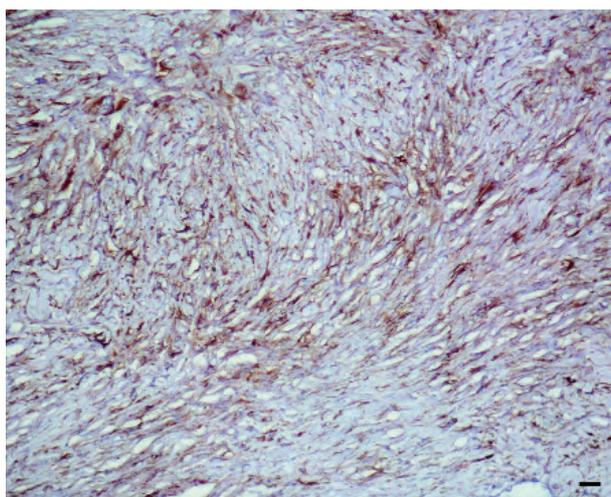


Figure 4. Immunoperoxidase labelling with antibody to vimentin. Avidin-biotin peroxidase complex method, Haematoxylin counterstain. Bar = 50 μ m.

smooth muscle differentiation is prominent, the tumour is classified as a special type of leiomyosarcoma (5,7). However, in our case, the tumour differs from the histological and immunohistochemical characteristics displayed by a well or less differentiated primary leiomyoma.

A protruding vulvar mass and vulvar discharge or bleeding in the vaginal tumours and other tumours of the genital tract have been reported as common clinical presentations (1,2,8,13). In the present report, the clinical findings of the tumour were consistent with the results of previous cases.

Histologically the amount of mitotic activity, cellular pleomorphism, atypia, and necrosis are the most important identifying features of malign tumours (5,7). In our case the growth showed a marked cellular pleomorphism and atypia and had a moderate mitotic rate, but no necrosis was detected. Despite the highly malignant characteristics of this tumour, local tissue invasion, metastasis, and recurrence did not appear to have occurred 6 months after its removal.

In a large number of tumour cases, immunohistochemical identification is essential for an accurate histopathologic diagnosis (4,5,12,14). In this case, immunohistochemical staining for α -SMA, desmin, vimentin, CD34, CD68, and S-100 protein was used to characterize the immunophenotype of the tumour and the results indicate that the tumour originated from both smooth muscle and fibrous tissues.

Morphologically, this tumour could be confused with other neoplasms, including schwannoma (7,14), malignant fibrous histiocytoma (5,15), and hemangiopericytoma (5,7,16). Schwannoma exhibits variable morphology referred to as Antoni A and/or Antoni B patterns, and it gave a positive immunoreaction for S-100 protein (7,14). In this case, the tumour cells did not react with S-100 protein and no findings of schwannoma were observed. Malignant fibrous histiocytoma is composed of a mixture of spindled fibroblast-like cells (storiform patterns) and rounded histiocyte-like cells that are together with multinucleated giant cells and inflammatory cells (5,7,15). None of these characteristic findings were detected in our case and the tumour cells stained negatively to CD68 antibody. Hemangiopericytoma is

characterised microscopically by spindle cells containing cytoplasmic processes arranged in whorls around blood vessels with a fingerprint pattern formed by neoplastic cells (7,16). In this case, these histopathological findings were not observed and the tumour cells gave a negative reaction to CD34 antibody.

As far as we know, this is the first description of a vaginal primary fibroleiomyosarcoma presenting in a Holstein-Friesian cow, which was evaluated both histopathologically and immunohistochemically. However, the results indicate that for the differential diagnosis of this type of vaginal tumour, histopathological findings could be supported by immunohistochemical staining.

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