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ORIGINAL ARTICLE

Clinical and Histopathological Diagnosis of Superficial Angiomyxoma in a Pregnant Holstein Heifer

Hossein Hamali[1], Monireh Khordadmehr ✉[2], Farinaz Jigari-Asl[2]

[1] *Department of Clinical Sciences, Faculty of Veterinary Medicine, University of Tabriz, Tabriz, Iran.* [2] *Department of Pathobiology, Faculty of Veterinary Medicine, University of Tabriz, Tabriz, Iran.*

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ABSTRACT

Myxomas are tumors of soft tissue with fibroblast origin characterized by their remarkable myxoid matrix rich in mucopolysaccharides. Here, we report the clinical and histopathological characteristics of angiomyxoma in a pregnant two-year-old- Holstein heifer. A notable and palpable mass was found in the right teat of the front quarter with no ulcer or infection. In the gross examination, the mass was soft, solitary, well-circumscribed, and unencapsulated grey to white. The mass was removed by local anesthesia and surgery. Histopathology dominantly demonstrated an unencapsulated and well-differentiated proliferation of spindle to stellate-shaped fibroblasts loosely arranged in a myxoid matrix associated with admixed numerous thin-walled blood vessels. Cellularity was low, mitoses were rare, and there was little cytological atypia. No evidence of hemorrhage, edema, necrosis, and acute inflammation were observed on the tissue sections. Immunohistochemical examinations were positive for S100 and vimentin markers. The surgical removal of the tumor mass with sedation and local anesthesia was suggested as the treatment of choice for optimal recovery.

Introduction

Myxomas are atypical mesenchymal tumors that tend to affect various organs, including the skin, bone, subcutis, aponeuroses, pharynx, tonsil, intestine, retroperitoneum, genitourinary tract, muscle, and joints.[1] These are tumors of soft tissue with fibroblast origin characterized by their dominant myxoid matrix rich in mucopolysaccharides. Three clinicopathologic forms of myxomas are subdivided into intramuscular myxomas, juxta-articular myxomas, and cutaneous myxomas or superficial angiomyxomas.[2] Despite being benign, myxomas display connections to specific syndromes and distinct biological behaviors that might affect prognosis and treatment strategies.[3] To prevent overtreatment and manage by restricted and less invasive procedures, it is essential to differentiate between this benign tumor and malignant neoplasms, such as myxoid leiomyosarcoma, myxoid liposarcoma ossifying fibromyxoid tumor, myxoid chondrosarcoma, and myxofibrosarcoma.[4]

The incidence of tumors in bovines is on the rise. Among all animal species, cattle rank second only to dogs in terms of tumor incidence.[5] Although tumors impacting the soft tissue and skin are the most diagnosed tumors among the various bovine malignancies, myxoma is one of the extremely uncommon bovine tumors with an incidence of only 3.51%.[6] Up to now, it is now well recognized that surgical removal of the mentioned mass is the suggested treatment for optimal recovery to normal function. In the present study, we report the clinical and histopathological characteristics of cutaneous angiomyxoma in a pregnant two-year-old- white Holstein heifer.

✉ Corresponding author. Email: khordadmehr@tabrizu.ac.ir

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Case Description

In April 2023, a pregnant two-year-old white Holstein heifer was admitted to the Large Animal Clinic, Faculty of Veterinary Medicine, University of Tabriz, with a visible mass of approximately 2 × 6 cm in the right front teat (Figure 1A and 1B). Clinical examination demonstrated no other abnormalities. In more detail, the rectal temperature was 38.5 °C, the respiratory rate (27 breaths/minute), heart rate (62 beats/minute), and appetite were normal. In the ultrasonography examination, the animal was about four months pregnant (with a natural mating).

Treatment and Outcome

Surgical excision was the treatment of choice for this case. Therefore, a sedation and then a local anesthesia were performed using 0.05 mg/kg of 2% xylazine hydrochloride (Rompun, Bayer HealthCare, LLC, Germany) by intramuscularly injection and 5 ml of 2% lidocaine hydrochloride (Pasteur Institute, Iran) by subcutaneous infiltration with a circle pattern at the base of the affected teat, respectively. After washing and disinfecting of the teat end by surgical povidone iodine, the tumor mass was removed by making a horizontal incision between the teat-end and tumor mass, and the tumor site was cauterized immediately using a veterinary electrocautery machine(KM62 Medical Veterinary Electrocautery, China). Postoperative care was included the disinfection of the surgical site for three days by using oxytetracyclin spray.

The removal cutaneous mass was examined grossly, and then it was processed for histopathological and immunohistochemical examinations. For this purpose, the tissue sample was commonly fixed in 10% neutral buffered formalin, processed routinely, sectioned in 5 µm thickness, stained by hematoxylin and eosin (H&E),[7] and studied by light microscopy. The sections were also subjected to immunohistochemistry for S-100 and vimentin markers. The sections were stained using a streptavidin-biotin peroxidase complex method.[7] Sections were finally stained with DNA fluorochrome Hoechst 33342 (0.25 mg/ml, 3 minutes, Sigma, St Louis, USA), washed in phosphate-buffered saline, and a coverslip was applied with aqueous mounting media (Dako, Glostrup, Denmark). Then, the sections were studied by light microscopy.

Clinical Relevance

In the gross examination of the removal mass, it was soft, solitary, well-circumscribed, unencapsulated, and grey to white in color with no superficial ulceration or secondary infection. Moreover, the cut surfaces of the proliferated mass contained round, discrete, and relatively homogeneous tissue with no lobulation or liquefied foci in the centers. Surgical excision is the treatment of choice[1] which was performed in the present study. Also, after surgery, there was no post-excision recurrence in the affected cow after five months. Also, there was normal milk production after parturition. Previous studies reported that recurrence is likely in myxoma cases; metastasis is rare, however.[1]

In the clinical examination of the presented case, there was not found abnormal clinical symptoms. Our results are in agreement with a recent study, which reported superficial angiomyxoma in a three-year-old pregnant Alpine cow in the umbilical region[8] with no clinical symptoms. But, another previous study reported an aggressive angiomyxoma (adhered to the rumen and spleen) in a two-year-old East Flemish cow, associated with the clinical sings, such as diarrhea and weight loss.[9]

In the current case, the tumor was composed of an unencapsulated well-differentiated proliferation of spindle to stellate shaped fibroblasts loosely arranged in a notable myxoid matrix associated with admixed numerous thin-walled blood vessels (Figure 1C and 1D). This matrix routinely stains light blue with common H&E staining. Low cellularity and mitoses to gather with little cytological atypia and, small and hyperchromatic nuclei were observed. Similar results have been previously reported in superficial angiomyxoma in a cow.[8] Moreover, similar histopathological characteristics have been reported in the aggressive angiomyxoma with stellate cells with delicate cytoplasmic processes, almost oval nuclei, with no nuclear atypia and mitotic activity.[9]

Superficial angiomyxoma should be differentiated from similar tumors, such as myxoid peripheral nerve sheath tumor and bovine fibropapillomain. In this regard, myxoid peripheral nerve sheath tumors commonly present a multilobular appearance, and the tumor cells are frequently found in concentric whorls or palisading configuration.[10] in contrast to myxoma, bovine fibropapillomas are notably identified by a dermal proliferation of plump and large fibroblasts haphazardly arranged in whorls and fascicles.[11] On the other hand, other similar superficial lesions should be differentiated with myxoma, like skin tag proliferation and granulation tissue. As more detail, a skin tag with fibroepithelial polyp and acrochordon configuration, is considered since it is typically a lesion consisting of excessive mature dermal fibrous tissue.[12] Exuberant granulation tissue, which is determined by neovascularisation and proliferation of fibroblasts within a proteoglycan-rich matrix[11] is also excluded since the mass is only superficially ulcerated.

Herein, in the immunohistochemical examination, proliferating stromal and vascular cells in this tumor presented the immunoreactivity for S100 (Figure 1E) and vimentin (Figure 1F) markers. But, CD34 markers were

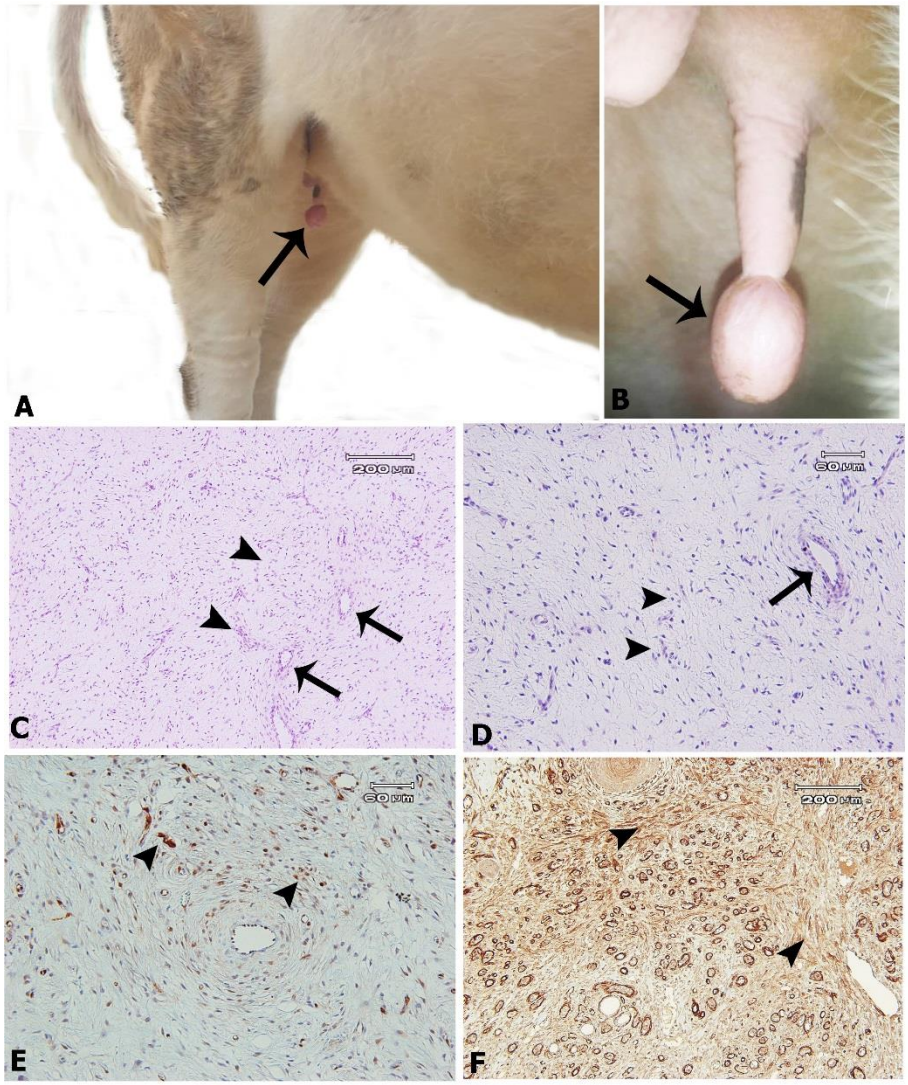

Figure 1. Superficial angiomyxoma in a Holstein heifer. A and B: a visible mass in the right front teat with grey to white in color and no superficial ulceration or secondary infection. C and D: The tumor was composed of an unencapsulated well-differentiated proliferation of spindle to stellate shaped fibroblasts (arrow heads) loosely arranged in a notable myxoid matrix associated with admixed numerous thin-walled blood vessels (arrows), H&E staining. E and F: In the immunohistochemical examination, proliferating stromal and vascular cells in this tumor presented the immunoreactivity for S100 (E) and vimentin (F) markers, IHC staining.

negative in this evaluation.

In a previous reports on aggressive angiomyxoma, the authors did not observed staining with smooth muscle actin, von Willebrand factor, antisera against oestrogen and progesterone receptors.[9] However, in superficial angiomyxoma, the tumor cells were positive for vimentin, desmin, and α-smoth muscle actin.[8] In immunohistochemical examinations, neoplastic cells of angiomyxoma frequently present variable positivity for α-smoth muscle actin and desmin,[13-16] and a myofibroblastic configuration has been considered.[13]

We presented a cutaneous superficial angiomyxoma with macroscopic and microscopic morphology, for which complete surgical excision was successfully conducted, resulting to rapid recovery of the affected heifer.

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Conflict of Interest

None.

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