

Case Report

A Rare Case of Multicentric Liposarcoma and Associated Reproductive Aberrations in a Nonpregnant Holstein-Friesian Crossbred Cow

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A five-and-a-half-year-old Holstein-Friesian crossbred cow was repeatedly treated for termination of overgestation, but without any success. On laparotomy, the site indicating fetal-like ballottement on transrectal palpation was occupied by three to four separate caseous and lobulated masses with adhered uterine horns in the omentum. Separation of the utero-omental adhesions retrieved normal-sized uterine horns into pelvic cavity. The right ovary was cystic. Ultrasonography detected another growth in the ventral abdominal musculature. Histopathologically, the omental growths suggested a pleomorphic type of liposarcoma. Presence of omental and muscular liposarcoma along with deep uterine-omental adhesions and a cystic ovary makes this paper a unique addition to the literature.

Benign lipomas of adipose tissue in cattle are not uncommon. They are usually found single and may be present at a variety of sites [1, 2]. In contrast, malignant and metastatic liposarcomas are a rare occurrence in animals [3] and have been documented in two separate reports in cattle [4, 5]. The latter has also been reported in the companion [6, 7] and wild [8] animals including reptiles [9], rat [10], and chameleon [11]. The present paper adds to the literature the presence of a multicentric and metastatic liposarcoma in omentum and ventral abdominal musculature along with an associated uterine-mesenteric adhesions and cystic ovary in a cow.

A five-and-a-half-year-old Holstein-Friesian crossbred cow was referred to the State Clinical and Referral Hospital of Veterinary College, Palampur, India, with a history of failure of termination of overgestation (9.75 months) using hormones. The induction protocol comprised of a combination of 500 mcg cloprostenol (Clostenol; Sarabhai

Zydus, India) intramuscularly and 40 mg dexamethasone sodium phosphate (Decamycin; Ranbaxy Laboratories Limited, India) intravenously, repeated once at an interval of five days. The cow was presented in the Clinics one week after the second hormonal treatment.

On general examination, the cow was alert, active and normal in feeding, defecation, and urination. There were no external indications of impending parturition. On transrectal palpation, the external os was palpable deep in the abdomen, whereas the uterine horns could not be appreciated. A distinct fetal bump kind of ballottement was felt deep ahead of the cervix in the abdomen.

Speculating a therapeutic failure to induce parturition and relying on the clinical observations, a hormonal treatment comprising of 25 mg dinoprost tromethamine (Lutalyse; Pfizer Animal Health, India) and 40 mg dexamethasone sodium phosphate (Curadex; Concept Pharma, India) was

given to the cow at the College Clinic. Thereafter, the cow was repeatedly examined every 12 h, but without any change in the genital status. The cow was discharged from the clinics with a caveat of reexamination one month later. Meanwhile, two blood samples were collected at fortnight interval through jugular venipuncture for progesterone estimation using radioimmunoassay.

Reexamination of the cow 30 days later did not reveal any change, and the cow was subjected to laparotomy in lateral recumbency. The incision line was parallel to the milk vein. Exploration of abdomen did not reveal any fetal mass/contents. Instead, the site, indicating fetal-like sensation on transrectal palpation, was occupied by three to four separately localized caseous and lobulated masses of 10–13 cm diameter in the mesentery (Figure 1). A similar kind of tissue mass was also found in and adjacent to the omentum. Furthermore, during incision, mild adhesions were detected in the musculature adjacent to as well as in peritoneum and omentum. On tracking the cervix, both the uterine horns were found to be adhered to the mesenteric growths in the abdomen. The adhered uterine horns were easily separated manually, following which the entire genitalia retrieved back into pelvic cavity. The two uterine horns were nonpregnant and of similar size, but the right ovary was three to four times larger than the contra lateral ovary and had a large fluid-filled structure on it. On corroborating the ovarian structure to the plasma progesterone concentrations of 2.4 and 1.5 ng/mL, it was diagnosed to be a luteal cyst.

Incisional biopsies were collected from the multiple sites of the different tissue growths in 10% buffered formal saline for histopathological investigation [12]. The operative site was sutured in a routine manner and the postsurgical treatment comprised of administration of 3000 mg ceftriaxone and 375 tazobactam (Intacef Tazo; Intas Pharmaceuticals Limited, India) for 5 days and 150 mg meloxicam, 4500 mg paracetamol, and 333 mL lignocaine (Melonex Plus; Intas Pharmaceuticals Limited, India) for 3 days, by intramuscular route.

Transabdominal ultrasonography (3.5 MHz) of ventral abdomen anterior to navicular region revealed a well-defined hyperechoic, hyperattenuating, and relatively uniform mass (Figure 2). Infiltrating echogenicity and shadowing were the prominent features of the mass. The hyperechoic and hypoechoic foci within the mass represented areas of haemorrhage and necrosis, respectively. The absence of fine echogenic lines within the mass indicates that it was not a well-differentiated structure.

The cow exhibited uneventful recovery and was discharged after three days.

Histologically, the mass was composed of neoplastic lipocytes containing intracytoplasmic lipid vacuoles of variable sizes, interstitial stroma, and encompassing remnants of mesothelial lining. Cells exhibited large, round to oval nuclei with coarsely clumped chromatin pattern and anisokaryosis. Steatonecrosis was also present (Figure 3). Based on the histological pattern and cell morphology, the findings in the present case were typical for a liposarcoma.

Estrus was observed 35 days after surgery; the cow was diagnosed and treated for endometritis using antibiotics at

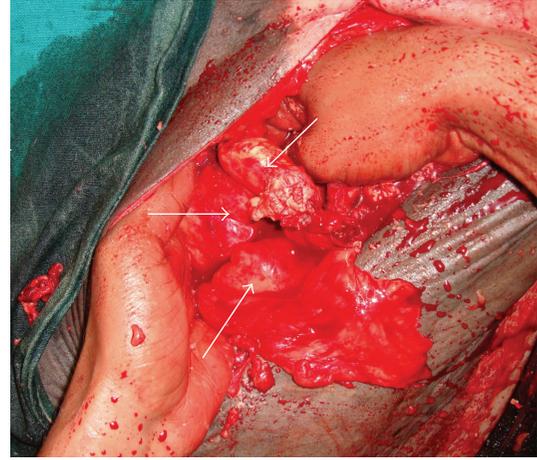


FIGURE 1: Liposarcoma growths (arrows) in omentum detected after laparotomy in a Holstein-Friesian crossbred cow.

farmer's location. Subsequently, the cow was inseminated on two occasions and as per the latest information the cow was nonpregnant four months after the last insemination.

The histopathological features of the tumorous tissue in the present case suggested it to be a pleomorphic type of liposarcoma; the other types reported include well-differentiated and myxoid type of liposarcomas [13]. Presence of lipoblast-like cells in the tumour mass is the most definitive for diagnosis of liposarcoma [14] and helps to differentiate it from almost similar malignant fibrous histiocytoma [15].

Liposarcoma is one of the most common malignant mesenchymal tumour and accounts for 20 percent of all sarcomas in humans [16]. Unlike humans, liposarcomas are rare neoplasms in domestic animals [5]. Location of liposarcomas in the mesentery and ventral abdominal muscles in the present case is different from previous reports indicating liposarcomas mainly in the pelvic region, with some growths in the abdominal parietal surfaces, the pleura, the pluck, and the intercostal muscles and throughout the lymphatics of head and neck of a cow [4]. In another cow, liposarcomas were reported in the nasal cavity with local invasions into the oral cavity [5].

Transabdominal sonography confirmed a uniform mass with foci of varying echogenicity. These foci can be areas of haemorrhages and necrosis [17]. The presence of fine echogenic lines within the tumour is a useful sign for diagnosing a well-differentiated liposarcoma. Presence of numerous fine fibrous septa in the lipomatous tumour tissue is thought to be responsible for this interesting phenomenon [18]. In contrast, pleomorphic liposarcoma does not show this type of sign as evident in the present sonogram, which also corroborates to the histopathological findings.

Functional irritation of liposarcomas with the adjacent organs is the cause of adhesion [19] which justifies the uterine-mesenteric adhesions in the present case. However, the descend of the uterus in the abdominal cavity to an extent that it was undetectable by repeated transrectal palpation is inexplicable. On freeing of uterus from adhesions, no external/internal tumorous growths or any other contents

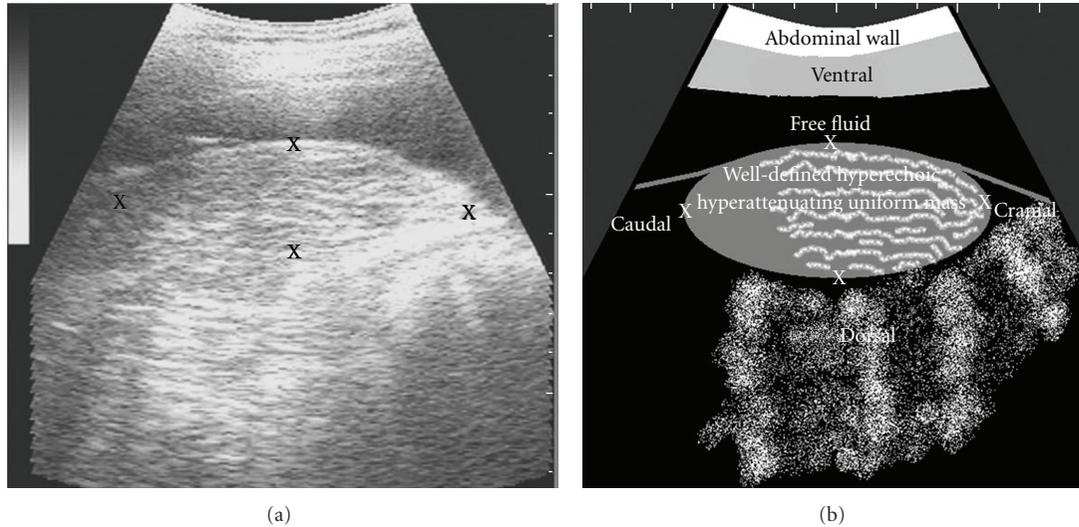


FIGURE 2: Ventral abdominal sonogram (cranial to navicular region) and its schematic depiction of a well-differentiated hyperechoic hyperattenuating uniform mass with infiltrating echogenicity and hypoechogenic fluid surrounding it.

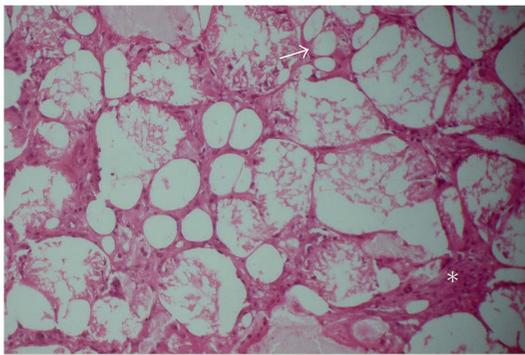


FIGURE 3: Pleomorphic lipocytes (arrows) encompassed in interstitial stroma and serosal lining (asterisk) along with some steatonecrosis (H&E 132X).

in uterine lumen were detectable, which otherwise could have been the potential reason of uterine descent in the abdomen. Failure to palpate uterine horns and the presence of tumorous mass in mesentery, whose size remained similar on repeated transrectal palpations, resulted in an erroneous diagnosis of presence of fetal mass. Failure of the transrectal ultrasonic probe to reach the tumorous site in abdomen and large size of the cow eluded a conclusive diagnosis of fetal presence. Liposarcomas in the abdominal cavity may be large enough to create intestinal obstruction [19] which, however, was not recorded in the present case due to smaller size of the tumors.

Presence of cystic ovary in the cow could be attributed to endometritis which perturbs the hypothalamo-pituitary axis [20]. The progesterone concentration of >1 ng/mL in the two blood samples was suggestive of a luteal cyst, which resolved after endometritis treatment during the post surgery estrous period, and the cow exhibited recurrent estrous cycles.

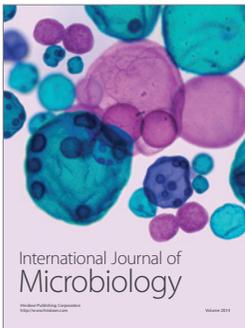
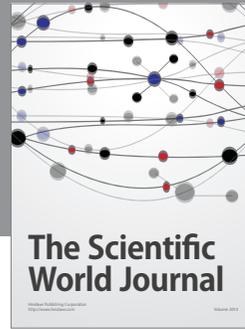
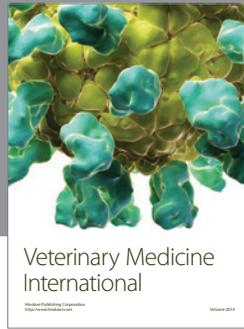
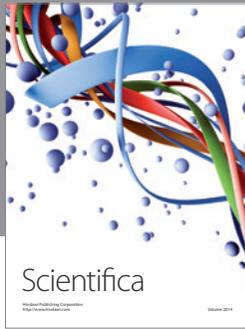
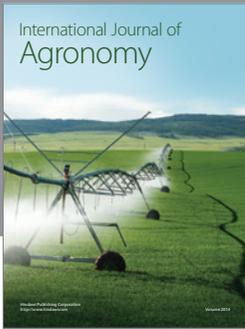
Most described cases of liposarcomas in animals are considered spontaneous, but some reports have suggested possible inciting agents. Benign liposarcomas surrounding foreign bodies, such as liposarcoma around 1.5-year-old implanted microchip in a dog [21] and liposarcoma around 10-years-old glass fragment in another dog [22], are on record. However, virus-associated liposarcomas of benign type in a hamster [23] and malignant type in a kitten [24] have also been reported. No attempts to isolate a virus or foreign body in the present paper obscure the probable etiology.

In conclusion, the gross, histopathological, and ultrasonic findings in this case are consistent with a malignant liposarcoma, which misled into the presence of fetus-like mass in deep abdomen; failure to trace the uterine horns due to their adhesions with omentum and presence of cystic ovary were the other features of the affected cow.

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