Case Report

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Ovarian Fibrothecoma in a Holstein cow: A Case report

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Keywords

bovine; Fibrothecoma; histopathology; Ovary; tumor

Abstract

A 5-year-old Holstein cow was referred to the Veterinary Medicine Hospital, Urmia University, Urmia, Iran, with abnormal estrous cycle. At rectal palpation, the unilateral ovary enlargement was detected. On transrectal ultrasonography view, the left ovary had uniformly hyperechogenic areas. The affected ovary was removed by ovariectomy and sent for histopathological examination. Histopathological evaluation revealed fibroblastic cells producing collagen fibers and theca cells containing lipids. Based on histopathological features, diagnosis of fibrothecoma was confirmed. This case reports an extremely rare fibrothecoma in cow.

Abbreviations

MHz: Megahertz
HCl: Hydrogen chloride
GTCT: Granulosa-theca cell tumors
WHO: Word Health Organization
mg: Milligram
Kg: kilogram

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Introduction

Ovarian tumors are uncommon in domestic animals.However, they have been reported more often in the mare, cow, bitch and chimpanzee [1]. Ovarian tumors are classified based on function, the histological features of tumor cells, similarity to normal cells, and embryological origins of the predominant cellular constituents [1]. Based on embryological origins, ovarian tumors can be related to three cellular subtypes: 1) the epithelium of the ovary consisting the surface modified mesothelium, (also called rete ovarii), for example in papillary and cystic adenomas and papillary adenocarcinomas. These cellular subtypes are less frequently involved in human and animal ovarian tumors; 2) the germ cells (dysgerminoma and teratoma) and; 3) the stroma of the ovary that includes the sex cords [1].

Ovarian fibrothecoma is a type of benign tumor of sex cord–stromal cell origin, but it is rarely malignant and includes both types of ovarian fibroma and ovarian thecoma cells [2]. Ovarian fibroma is a mesenchymal cell tumor which consists of fibroblasts and collagen. It seldom has thecal cells or estrogenic production. Fibromas has less cellularity and collagen content in comparison to fibrothecomas. Edema in organs is one of the main consequences of fibroids cancer which happens in more than 50% of the patients [3]. In comparison, ovarian thecoma which is a sex cord-stromal ovarian tumor, derives from normal cells constituting endocrine apparatus of the ovary. It contains lipid vacuoles with a small component of fibroblasts and has the capacity to produce steroid hormones. Due to histological overlapping between fibroma and thecoma tumors, the term fibrothecoma is used for describing a neoplasm that contains features of both thecomas and fibromas [4]. The present study describes the pathomorphology and ultrasonography findings of fibrothecoma in a Holstein cow presented to the Veterinary Medicine Hospital of Urmia University.

Case Presentation

A 5-year-old Holstein cow was referred to the Veterinary Medicine Hospital of Urmia University, Urmia, Iran being calved seventy-two days ago. The main complaints were abnormal estrous cycle and invisible estrus signs following two hormonal therapies. Perineal and vulvar conformation were examined by transrectal palpation and visual evaluation by vaginoscope and ultrasonography (Pi-medical 100LC, rectal linear probe 7.5 MHz). The routine procedures were applied on the tissue and it was stained with hematoxylin-eosin for histopathological examination. Moreover, immunohistochemical examination was performed with formalin-fixed tissue and various antibodies

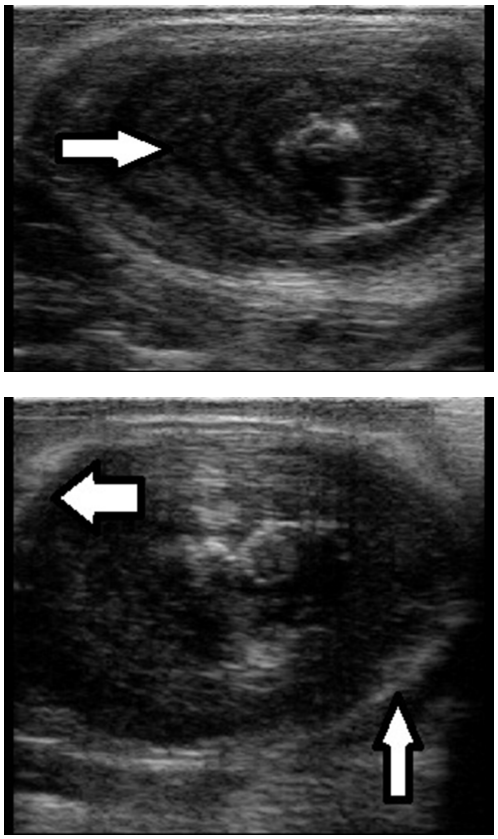

Figure 1
Ultrasonography picture of left ovary. Cyst, with the central anechoic area, covered by a hyperechoic wall with 0.5 cm thickness.

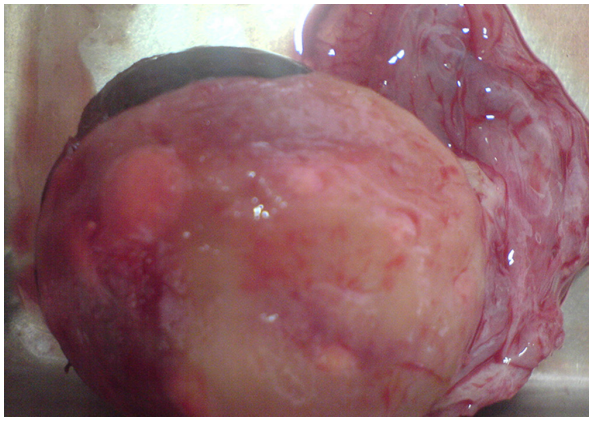

Figure 2
Ovarian fibrothecoma appears as a solid mass with smooth surface

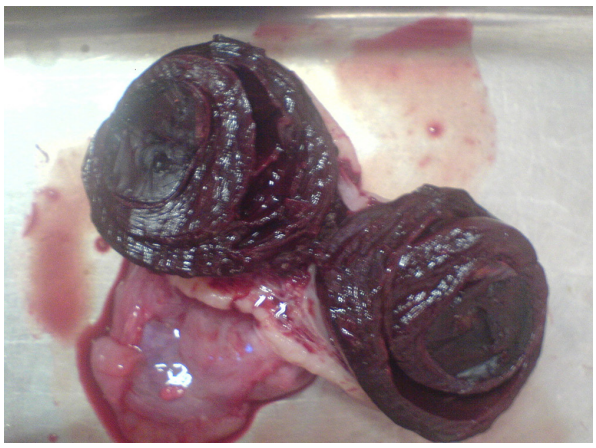

Figure 3
Macroscopic image of the cut of the ovarian fibrothecoma, surrounded by thick and firm consistency wall.

(vimentin and calretinin) were used to define the immune profile of the fibrothecoma [5].

Results and Discussion

Vaginoscopy indicated that vulvar and perineal regions were normal, however, the vulvar region was edematous. Uterus and right ovary were normal in size and consistency and no remarkable

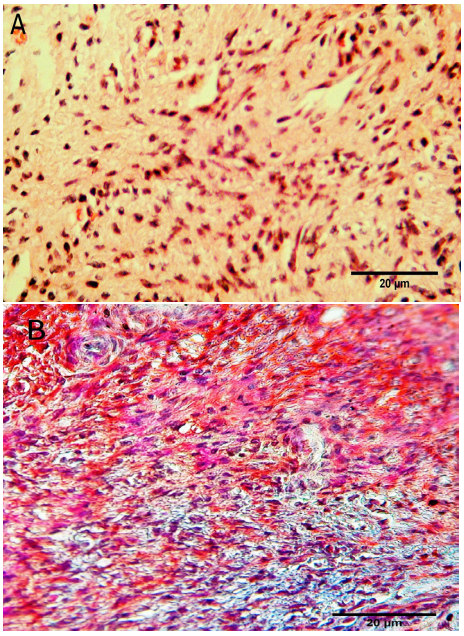

Figure 5
Fibrothecoma tumor cells are positive for vimentin (A) and Calretinin (B) (Immunohistochemistry, 400x).

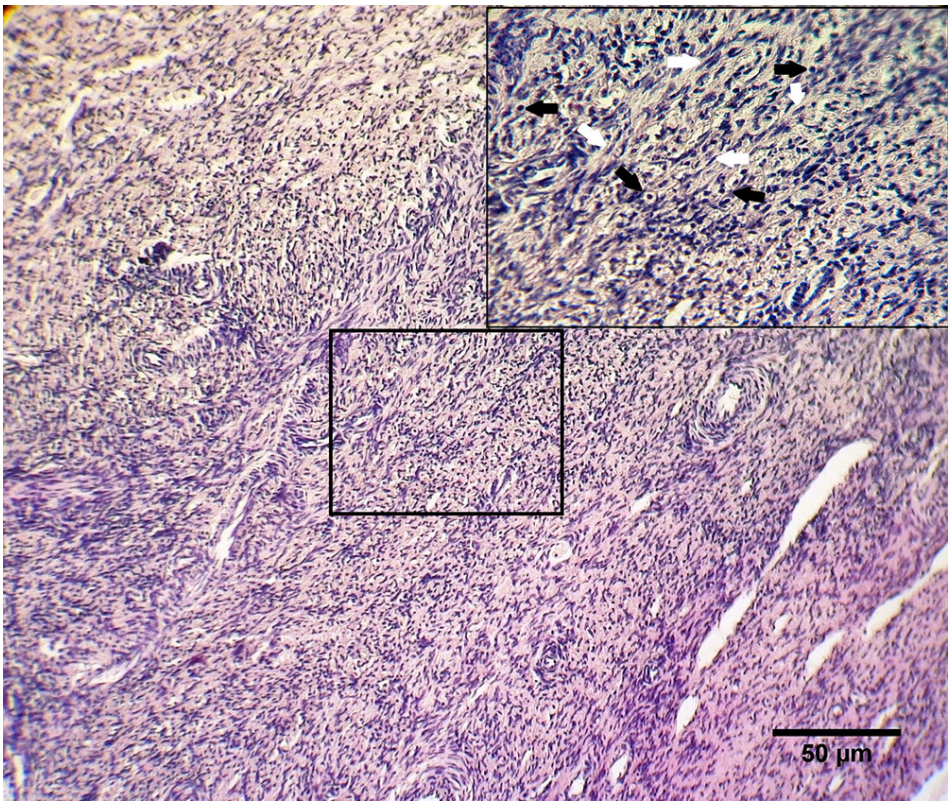

Figure 4
Microscopic examination of ovarian fibrothecoma shows hypercellularity, with two cellular patterns; as seen with higher magnification in right corner (H&E; 400x), fibroma that contained spindle-shaped cells with longed nuclei in a fibrocollagenous stroma (white arrows), and the thecoma that contained compressed oval-round or fusiform cells with vacuolated cytoplasm (dark arrows); (H&E; 100x).

structure (follicle or corpus luteum) was recognized during transrectal palpation. In contrast, the left ovary was massive and smooth. On transrectal ultrasonographic imaging, uterus (without edema) was normal, but there were small abcesses in the middle part of the cervix. The left ovary had uniformly hyperechogenic areas on the ultrasonography (Figure 1). Based on the rectal palpation and ultrasonographic findings, the left ovary tumor was suspected.

It was removed with standing laparoscopic ovariectomy method. Left-flank approach in caudal area of paralumbar fossa was scraped, shaved and made ready for operation. L–block anesthesia was used and inverted with 10 ml of lidocaine HCl 2% (0.22 mg/kg; 5.5 ml/500 kg) (Pasteur Institute, Tehran, Iran) [6]. After ovary was externalized on peritoneum cavity and exposed to proper space, the mesovarium was ligated with 2 polyglycolic acid (Supa, Tehran, Iran), by using a sliding half-hitch knotting technique. The ovary was removed with mayo scissors over the ligatedregion and the abdominal wall was closed with a 3-plan suture in a simple continuous pattern with 2 polyglycolic acid.

In macroscopic study, the tumor weighted 254 grams and solid mass diameter was approximately 4.67×4.87×3.03 cm^3. The outer surface of the ovary was smooth (Figure 2). After the tumor was opened, we noticed that it was surrounded by a thick, firm, and consistent wall and the interior section was composed of a solid mass along with a necrosed and a hemorrhaged part (Figure 3). Histologically, a benign neoplasm was observed which consisted of two cellular patterns. The stroma revealed a dense fibromatous area that was composed of fibroblastic cells in an interwoven pattern (Figure 4). Results of immunohistochemical staining delineates that the spindle-shaped neoplastic cells were positive to vimentin (Figure 5A), while tumor cells were strongly positive for calretinin (Figure 5B).

Discussion

Fibromas and Fibrothecomas are the sex cord-stromal origin tumors [1]. In addition, according to WHO (World Health Organization) classification of ovarian tumors, they are a subgroup of granulosa-theca cell tumors (GTCT) which belong to the thecoma-fibroma group [7].

In this study, fibrothecoma was detected after ultrasonography, histopathological examination, and rectal palpation. Conte and colleagues examined 11 cases of fibrothecoma and suggested some diagnostic sonographic patterns [4]. The presence of homogeneous echogenic patterns that marks the posterior acoustic shadowing along with the lack of calcification, is highly suggestive that a fibrous ovarian fibrothecoma exists.

To the best of our knowledge, this is the first fibrothecoma report in cow, but there were several reports about other animals. Ovarian tumors in mares are almost unilateral and are present at an incidence of 5-6 % in comparison to other ovarian tumors and the fibrothecomas is extremely rare in this sub-group [8]. Changes in behavior will happen in mares in case of tumor's activity and hormonal production, and it should be noted that high estrogen secretion by thecomal section of tumor leads to behavioral changes. Abnormal clinical signs such as defects in ovulation or implantation may appear which lead to infertility, prolonged anestrus, aggressiveness, masculine behavior, or nymphomania [9]. Azizi et al. reported an ovarian fibrothecoma in a 10-year-old Arabian mare that had a similar gross lesion and microscopic feature as shown in the present study [10]. Jorritsma and colleagues has reported granulosa-theca tumor in a 2-years-old cow [11]. The case didn't show pregnancy after artificial insemination and enterd into estrus again, but after the blood and histopathological examination thecoma tumors was diagnosed. This case and another similar case reported by Tontis and colleagues had nonspecific and definitive diagnostic clinical signs similar to our report and the tumor classified as a Thecomas after histopathological examination [12]. Different types of solid benign ovarian cysts and tumors, such as Brenner tumor, thecoma, fibroma, and fibrothecoma, may manifest similar echogenicity on ultrasonography [13]. Thus, it is suggested that other more specific tests such as, histopathological evaluation and immunohistochemical examination [14] should be performed in order to obtain a more accurate diagnosis [15]. Immunohistochemically, the tumor cells in this case were strongly positive for calretinin and vimentin.

In conclusion, the cow in this report, with an enlarged ovary includes a tumor that has metastasized to the ovary. To the best of our knowledge, it is the first ovarian fibrothecoma reported in Holstein cow which was confirmed by histopatholog-

ical and immunohistochemical examination.

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Author Contributions

Conceived and designed the experiments, performed the experiments, and wrote the paper: A.S., R.B., A.N. and B.P. Analyzed the data: A.S.

Conflict of Interest

The authors declare that they have no conflict of interest.

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