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Phyllodes Tumor of Mammary Gland in a Dog: Case Report

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Abstract: This report describes a rare mammary gland tumor associated with the left uterine horn inguinal hernia in to the tumor. This tumor occurred in a 6-year-old female mixed breed dog. The patient had a masse in the left fourth and fifth mammary glands. Grossly, the masses were rigid, firm and immobile. On cut surface, it was solid and gray-white and shows the cleft-like spaces. Microscopically, the tumor was composed of two distinctive neoplastic components, stromal hypercellularity and the presence of benign glandular elements. According to gross view and two key features this tumor known as phyllodes tumor. All forms of phyllodes tumors are regarded as having malignant potential. This tumor is very fast growing and can increase in size in just a few weeks. The common treatment for phyllodes is wide local excision. In the present case, a good clinical outcome was observed after surgical treatment. Indeed, no recurrence or pulmonary metastasis of tumor tissue was observed during the three months post surgery.

Key words: Mammary Gland · Phyllodes Tumor · Dog

INTRODUCTION

Canine mammary tumors are the most common neoplasm in female dogs and approximately 35% to 50% of them are malignant [1,2]. Mammary tumors can metastasize via lymphatic's and blood vessels to regional lymph nodes but may spread to other organs such as lung, kidneys, bone, adrenal glands, heart, liver, brain and skin [3,4].

The cause of mammary gland neoplasia is unknown; however, many are hormone-dependent and most can be prevented if ovariohysterectomy is performed before 1 year of age. Mammary tumors affect female dogs almost exclusively, with an increasing incidence from 6-7 years of age onwards [5]. The most common site for canine mammary tumors is the caudal mammary glands. The initial diagnosis of canine mammary tumors is based on clinical signs, symptoms and while fine-needle aspiration may be useful [6], histology is necessary for an accurate diagnosis [7]. Malignant canine mammary tumors are more frequent than benign ones [8,9].

Phyllodes tumors, also cystosarcoma phyllodes, are typically large, fast growing masses that form the periductal stroma cells of the breast. They account for less than 1% of all human breast neoplasm's. They are also known as serocystic disease of Brodie [10]. The purpose of this report is to describe the morphological and histological features of an unusual type of breast neoplasm, not yet described in the bitch.

Case History: A six years old mixed breed female dog weighing 8.3 kg, was presented with a history of a rigid, firm and immobile mass in left fourth and fifth mammary glands which had proceeded for four months. This mass measured 7.2 × 5.8 × 4.7 cubic centimeters that was attached to the surrounding tissues. In examination, her body condition and appetite were normal. The rectal temperature was 38.9°C and respiration rate was 18 breaths/minutes. The animal had good general condition and no abnormalities were noted regarding her respiration and pulsation values. During examination of the regional lymph node, it was observed that the left inguinal lymph node was bigger than others. A blood sample was collected for complete blood count and revealed a Hb of 14.5 (g/d), PCV 39%, neutrophils 6800, eosinophils 115, basophils 0, lymphocytes 2700 and monocytes 230. Urinalysis findings were also normal.

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Thoracic and abdominal radiographs performed ruled out the possibility of metastasis with this mammary tumor by the time of diagnosis. The clinical stage of this tumor was evaluated to be $T_3N_1M_0$ after clinical and paraclinical examinations.

Preoperatively cefazolin was administered (22 mg/kg IV). The dog was pre-medicated with atropine sulfate (0.04 mg/kg SC) and anesthesia was induced with ketamine (10 mg/kg IM) plus xylazine (1.1 mg/kg IM). After intubation, general anesthesia was maintained with isoflurane (1-2%) in oxygen (1.5 L /min).

The dog was positioned in dorsal recumbency with the thoracic limbs fixed cranially and the pelvic limbs fixed caudally in a relaxed position. The entire ventral abdomen, caudal thorax and inguinal areas should be clipped and prepared for aseptic surgery.

Affected glands on the left side were removed with regional mastectomy. Left gland numbers 4 and 5 were removed with a margin of normal tissue successfully. During dissection, we found that the left horn of uterus and some segments of omentum were attached to the base of the tumor through the inguinal hernia. Therefore, we had to perform ovariohysterectomy with changing the instruments at the time of tumor removal.

A Penrose drain was placed to help prevent fluid accumulation. After closure of the subcutaneous tissue with vicryl 2/0 and the skin with nylon 2/0, penicillin was administered 22.000 IU/kg IM, daily for 5 days. An Elizabethan collar was used until the skin sutures were removed. An abdominal bandage was used to support the wound, compress dead space and absorb fluid. Bandages were changed daily for the first 2 to 3 days, or as necessary to keep them dry. The wound was being inspected for inflammation, swelling, drainage, seroma, dehiscence and necrosis. Drain was removed when drainage diminishes to a minimal amount. Skin sutures were removed 14 days postoperatively.

On cut surface of the tumor, it was solid and gray-white and shows the cleft-like spaces. Tissue sample was fixed in 10% neutral buffered formalin, processed routinely, embedded in paraffin, sectioned at 5 μm, stained with hematoxylin and eosin and studied by light microscopy. Microscopically, the tumors were composed of two distinctive neoplastic components, stromal hypercellularity and the presence of benign glandular elements. According to gross view and two key features this tumor known as phyllodes tumor.

DISCUSSION

Phyllodes tumors are a fibroepithelial tumor composed of an epithelial and a cellular stroma component. They may be considered benign, borderline, or malignant depending on histological features including stroma cellularity, infiltration at the tumor's edge and mitotic activity. All forms of phyllodes tumors are regarded as having malignant potential. They are also known as serocystic disease of Brodie. These tumors are very fast growing and can increase in size in just a few weeks [10]. The common treatment for phyllodes is wide local excision. Other than surgery, there is no cure for phyllodes, as chemotherapy and radiation therapy are not effective. The risk of developing local recurrence or metastases is related to the histological grade,

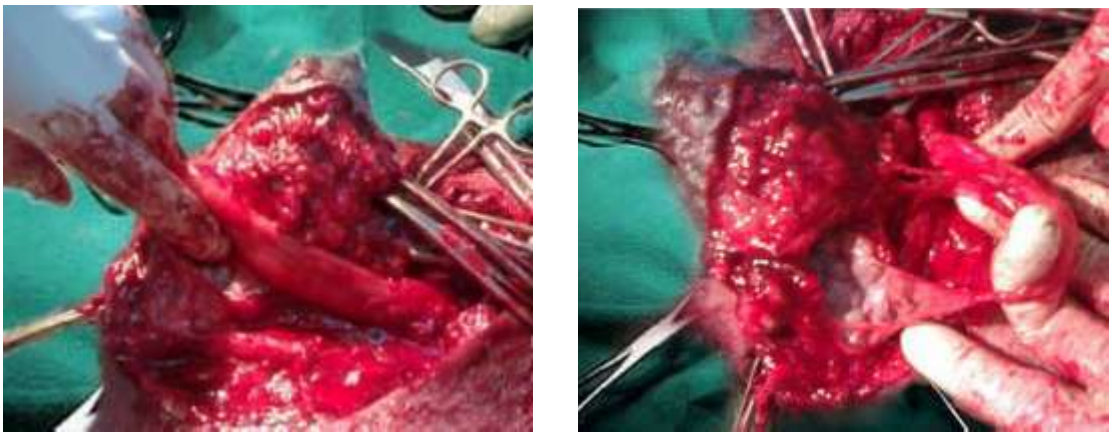

Fig. 1: During dissection, the left horn of uterus and some segments of omentum found that were attached to the base of the tumor.

Fig. 2: Macroscopic appearance of the tumor showed a lobular pattern delineated by fibrous septa.

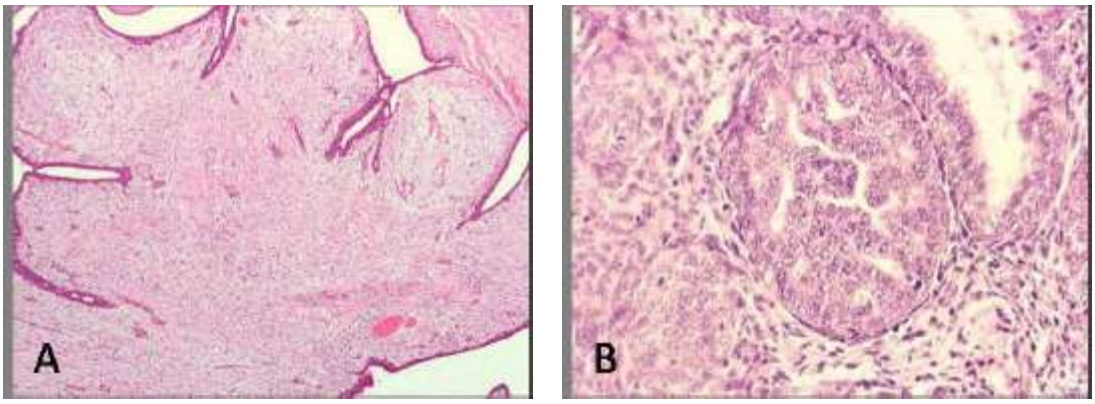

Fig. 3: Section of the mammary phyllodes tumor in dog (H and E). phyllodes tumor showing 'leaf-like' appearance (A, ×100) and mitoses (B, × 250) on microscopy.

according to the above-named features. Despite wide excision a very high percentage of surgeries yielded incomplete excision margins that required revision surgery [10]. A large recent study has derived a risk calculator for relapse risk of phyllodes tumors after surgery [11]. One study has suggested that total mastectomy is more effective than breast-conserving surgery [12]. A recent study by Barth *et al.* [13] suggests that radiation treatment after breast-conserving surgery with negative margins significantly reduces the local recurrence rate for borderline and malignant tumors.

The histological finding observed in this case was similar with previous observations for this rare human breast tumor and agree with the diagnosis of phyllodes tumors. This is the first case of this tumor described in dogs. Although there are well established differences between canine and human breast tumors, veterinary pathologists should be prepared to diagnose rare cases of mammary tumors similar to that observed in humans, as described in this paper.

The effect of ovariohysterectomy at the time of tumor removal is extremely controversial on local tumor recurrence and survival. Previous studies have found no effect; however, recent studies by Sorenmo *et al.* [14] have found an increase in survival for dogs that underwent ovariohysterectomy at the time of their primary mammary gland tumor removal or ≤ 2 years of the time of their primary mammary gland tumor removal.

In the present case, a good clinical outcome was observed after surgical treatment. Indeed, no recurrence or pulmonary metastasis of tumor tissue was observed during the three months post surgery.

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