

AN EVALUATION OF MASTECTOMY FOR REMOVAL OF MAMMARY GLANDS TUMORS IN BITCHES

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ABSTRAT

The aim of this study is an evaluation of mastectomy for removal of mammary glands tumors of bitches referring to histopathological aspect.

During a period of three years extending from March 2007 till March 2010, seventeen bitches were presented to department of surgery-college of veterinary medicine-Baghdad, suffering from mammary glands tumors were treated surgically. Diagnosis of the cases was based on case history, clinical signs, in addition several photographs were taken to denote if there was metastases of the tumor to other organ or not. The definitive diagnosis was confirmed via histopathological examination of tumors biopsies.

The surgical operations were done under the effect of general anesthesia represented by a combination of Ketamine–Xylazine preceding by atropine sulfate. All drugs injected I.M.

Following surgery secondary health problems were happened in seven animals out of (17 treated cases).

Histopathological examination of tumor biopsies obtained from affected glands revealed that the tumor was adenocarcinoma (malignant type).

Finally we can concluded that surgery is an effective method to cure the mammary glands tumors in spite of secondary complications in some bitches, which all responds to treatment with the exception of the dead bitch.

INTRODUCTION

The mammary glands are modified skin sweat gland and there close physiological relationship with reproductive organs rather than with integument. There are five mammary glands on each side joined together in a chain. In bitches with 10 normal teats, the pattern is two pairs of chest teats, two pairs of abdominal teats, and one pair of inguinal or groin teats (1).

Mammary tumors can occurs as single or multiple nodules within a mammary gland or chain and there is a 50% chance that it is malignant and a 50% chance that it is benign. The majority of mammary tumors (60-70%) occur in gland 4 and 5 (2).

Diagnosis of tumors is based on clinical evaluation (complete blood count and serum chemistry profiles), also radiographs are useful to detect metastases (3). Fine needle aspiration biopsy (FNAB) is used to investigate the tumor which is safer and less traumatic than an open surgical biopsy (4). Mammography (mammogram) is used

to aid in the early detection and diagnosis of mammary diseases (5). The definitive diagnosis is based on histopathology on excisional biopsy specimen (6).

Numerous trials are used for tumor treatment such as radiotherapy which is a local painless treatment (7). Also chemotherapy is the systemic (whole body) treatment of cancer with anticancer drugs, it is often used to treat patient with cancer that has spread (metastasized) through the blood or lymph systems to other parts of the body (8). Hormonal therapy is one of the major modalities of medical treatment for cancer through exogenous administration of specific hormones particularly steroid hormones (9). Immunotherapy by various drugs (collectively referred to as immunomodulators) can affect the immune system. Some of these drugs show some promise in cancer treatment, both in topical and systemic use (10). Surgery to remove the tumor completely is the most effective method for treatment of tumor (11).

The present work was conducted to evaluate the using of surgical technique for removal of mammary gland tumors in different species of pure-breed bitches, referring to histopathological aspect.

MATERIALS AND METHODS

During a period extending from march 2007 to march 2010, seventeen bitches, (table 1) were presented to department of surgery-college of veterinary medicine-Baghdad, suffering from mammary gland tumors which were diagnosed based on case history, clinical signs of the tumors which characterized by hard nodules (firmness) in different locations of mammary glands (figure 1), some of them were ulcerated (figure 2). In certain cases we noticed anorexia and generalized weakness (emaciation). To detect metastases, radiographs were used, thoracic (3 views-left and right laterals and ventro-dorsal) and abdominal (2 views-lateral and ventro-dorsal). The definite diagnosis was accomplished by histopathological examination of the tumorized mass. Surgical intervention was used for the treatment of all cases of bitches mammary gland tumors.

Table -1- Species of bitches and locations of mammary tumors

Species of dogs	Age (years)	Size of tumor (cm)	Locations
Terrior	11	5	Left inguinal mammary gland
Terrior	9	6	Left inguinal mammary gland
Terrior	12	8	Right inguinal mammary gland
Terrior	8	4	Left caudal abdominal mammary gland
Terrior	13	5	Right caudal abdominal mammary gland
Terrior	7.5	4	Right cranial thoracic mammary gland
Pekingese	10	7	Right inguinal mammary gland
Pekingese	6	4.5	Right inguinal mammary gland
Pekingese	8	5	Left cranial abdominal mammary gland
Poodle	13	6.5	Left caudal thoracic mammary gland
Poodle	7	4	Right inguinal mammary gland
Sheep dog	14	9	Left inguinal mammary gland
Sheep dog	9	5.5	Left caudal abdominal mammary gland
Germanshepherd	8.5	6	Right caudal thoracic mammary gland
Germanshepherd	11	10	Left inguinal mammary gland
Doberman	6	4.5	Right cranial abdominal mammary gland
Boxer	9.5	7	Right inguinal mammary gland

Surgical Technique (Mastectomy)

1. Bitches withheld from food for 24 hours and from water for 6-12 hours prior to surgery.
2. The operative site was prepared for aseptic surgery (figure 3).
3. Intravenous fluid therapy had been used for emaciated case before and during surgery.
4. Atropine sulphate as a premedication was injected IM in a dose of 0.03 mg/kg B.W. Fifteen minutes later, general anesthesia represented by a mixture of Ketamine–Xylazine in a dose of 15mg/kg and 5mg/kg B.W. respectively was injected via IM route (in the thigh muscle) (12).
5. Surgery begun with a sharp circular incision in the skin adjacent to the hard mass (Figures 4). Bleeding was controlled by routine manner.

6. Blunt dissection with surgical scissors was performed to separate the mass from its attachment with the abdominal wall (Figure 5), when this had been achieved (figure 6), the tumor mass was removed (figure 7).
7. The skin incision is restitched with simple interrupted suture via silk (No. Zero) (Figure 8).

Post-Surgical Cares:

1. Head collar was used to prevent animal interrupt the surgical site.
2. Animal put in a clean place and the skin wound was inspected periodically.
3. Broad spectrum antibiotic represented by penicillin – streptomycin in a dose of 20000 I.U. and 10mg/kg B.W. respectively was administered I.M. for five days.
4. Skin suture were removed in (8-10) days post surgery.

Microscopic Examination

Biopsies of 1cm³ were harvested from the surgically removed mass and were fixed in 10% neutral buffered formalin for 72 hours then routinely processed and embedded in paraffin. The paraffin embedded block were cut at 5-6 micrometer and stained by Hematoxyline and Eosine Stain according to technique used by (13).Then the section were examined under the light microscope.



Figure 1: The tumor mass located between 4 and 5 mammary glands.



Figure 2: Bitch with ulcerated mammary gland tumor.



Figure 3: The site was prepared for aseptic surgery.



Figure 4: Circular incision was made around the tumor.

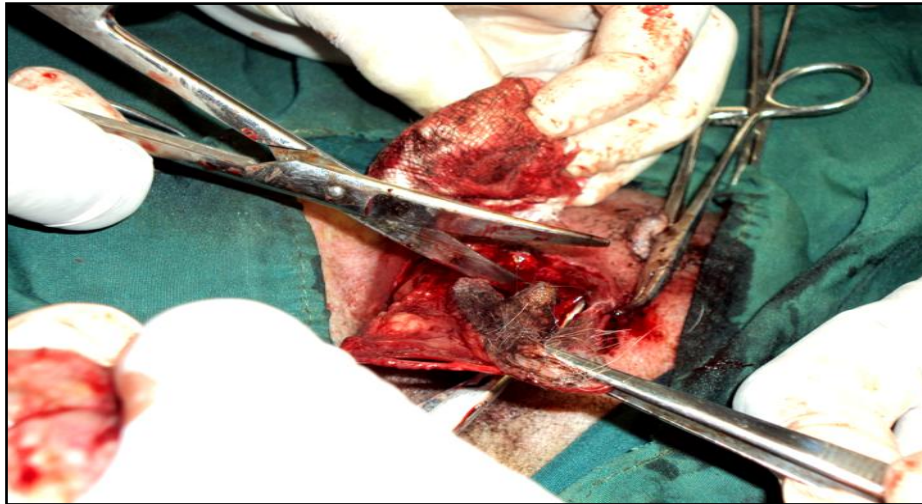


Figure 5: Blunt dissection to remove the tumor from the surrounding tissues.

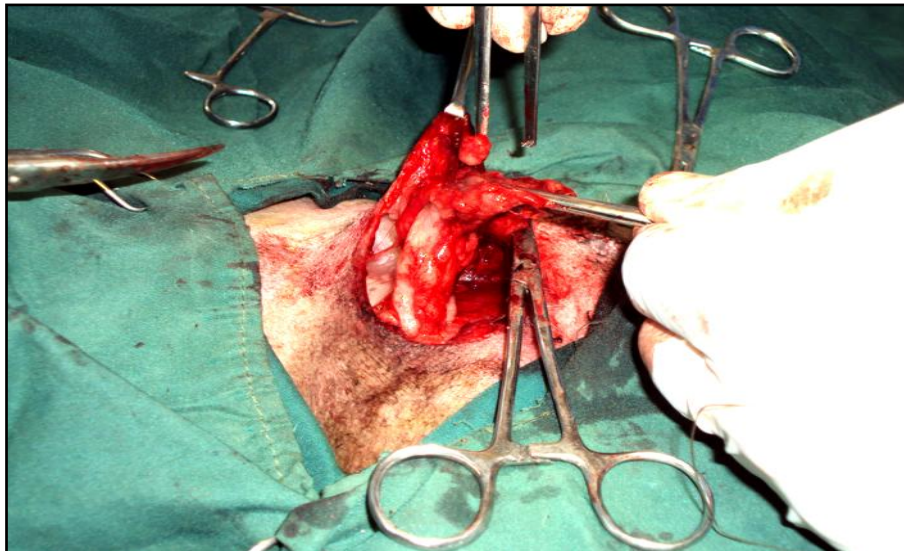


Figure 6: The dissection of the tumor was completed.

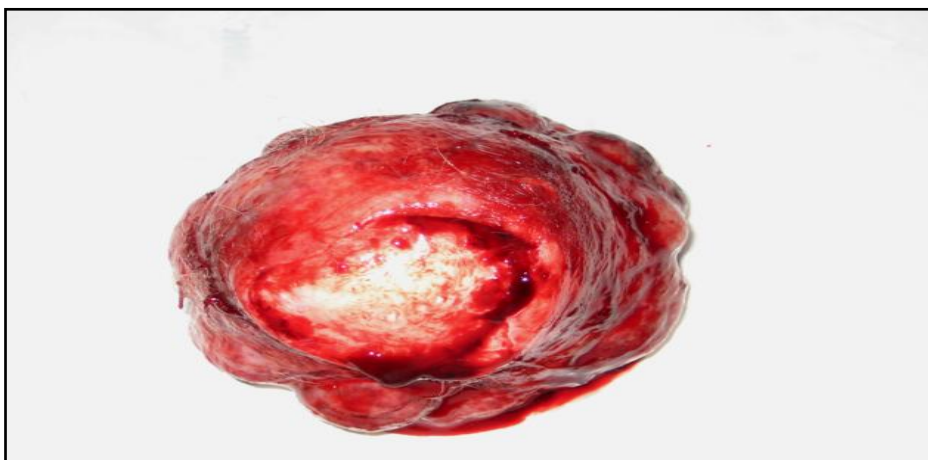


Figure 7: The removed tumor is about 6 cm. length.

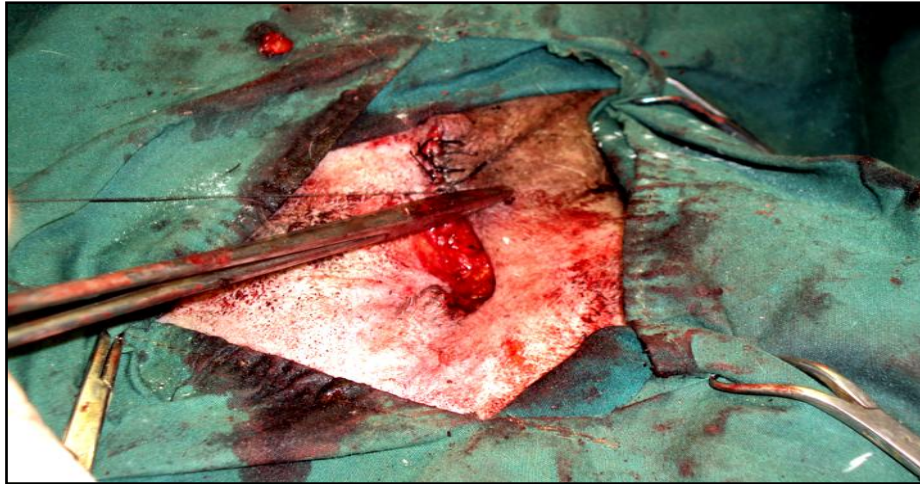


Figure 8: The skin incision was closed with non absorbable suture material (silk No.0).

RESULTS

The time nessediated for surgery to remove tumor from the mammary glands ranged between (50 ± 12) minutes. Then the animals recovered from anesthesia smoothly with no apparent complications, but after clinically post-surgical follow-up, some complications which listed in table (2) were encountered. All complications were responded to treatment with the exception of one (dead bitch).

Table -2- Secondary complications in (7) out of (17) mastectomized bitches.

Type of complications	No. of affected bitches	Time of occurrence (days)	Fate after treatment
Seroma	2	5-7	Responded to multiple aseptic aspiration of the serous fluid twice/daily, and the bitches resumed it normal activity after three days of treatment.
Wound dehiscence	2	2-4	In first bitch, the dehiscence was not extensive thus, it lifted to heal by second intention, while the wound in another bitch nessediated debridement and closure.
Oedema of the rear limb	1	4	The bitch subjected to moderate exercise, warm compresses and diuretics which result in resolution of oedema.
Recurrence of the tumor	1	75	The bitch required second operation to remove the tumor. also spaying (ovariohystrectomy) had been done.
Death	1	92	One bitch dead due to metastasis of tumor to the lung (invasive lesion) were seen in post morton examination.

Histopathological Findings:

Histopathological sections revealed that the type of the tumors affected the bitches were adenocarcinoma .

The main microscopic finding are characterized by the proliferation of tumor cells with hyperchromatic nuclei arranged as sheets with vacuolation of their cytoplasm as well as mitotic figures index (figure 9). Other sections showed that the tumor cells filled the acini with proliferation of fibrous connective tissue in stroma (figure 10). Sometimes the hyper chromatic pleomorphic tumor cells form mass in the interstitial tissue. Mononuclear cells infiltrate in the proliferated connective tissue of interstitial tissue of mammary gland (figure 11).

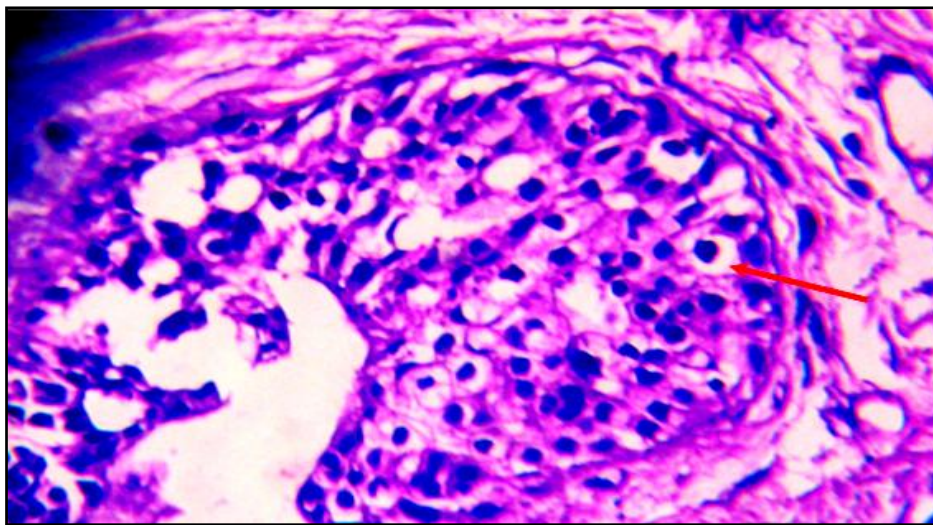


Figure 9: Hyper chromatic tumor cells arranged as sheets with vacuolated cytoplasm (arrow) and mitotic figure index (H&E 40X).

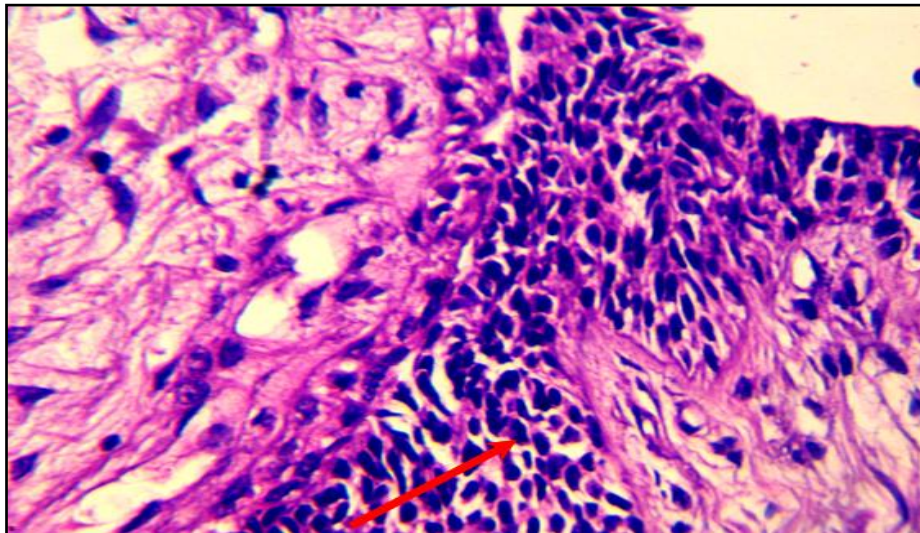


Figure 10: The tumor cells filled the acini with proliferation of fibrous connective tissue in stroma (arrow) (H&E 40X).

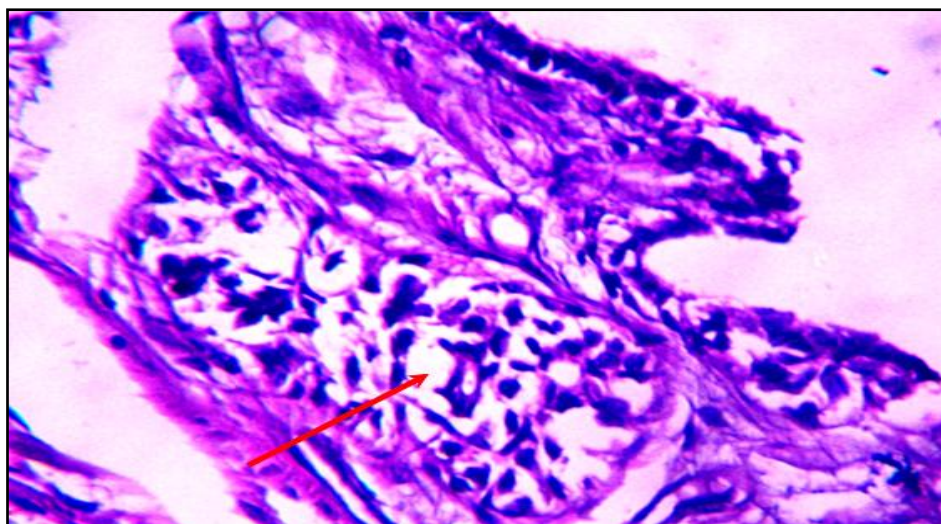


Figure 11: hyper chromatic pleomorphic tumor cells form mass in the interstitial tissue (arrow) (H&E 40X).

DISUSSION

Mammary gland tumors are the second most common group of neoplasms in bitches following skin tumors, and comprising 52% of all neoplasms of the mammary gland tumors diagnosed in bitches, 40 to 50% are malignant (14).

In the present study, the clinically treated bitches were old ages, and this finding is agreed with (15), who stated that the median age for diagnosis of mammary tumors in dogs is 10 years; neoplasms rarely occur in dog < 4 years of age. At 6 years of age, the risk of developing a mammary tumor appears to increase markedly. It also noticed that after 14 years of age, the incidence of benign mammary tumors level off while the incidence of malignant tumors continues to increase.

We noticed that the majority of mammary glands tumors occur in glands 4 and 5 (60-70%) possibly due to the fact that the two most caudal pairs of glands contain the most mammary tissue (16).

Postoperative complications associated with mastectomy include seroma wound dehiscence, oedema of rear limb recurrence of the neoplasm and death of one bitch.

Seroma formation is most common in groin region; it may be ascribed to large size of tumor which causes pressure on the blood vessels supplying the area lead to ooze of serous fluid or excessive dissection while separating the tumor from its attachment with abdominal wall, and improper control of bleeding, this result was in accordance with (17).

Rear limb edema may occur because of the surgery or the tumor. Removal of inguinal mammary tumors temporarily interrupts lymphatic drainage (18).

Wound dehiscence may be attributed to infection or interruption of the wound by the limbs of the animals although collars on the head were used for all treated bitches.

Recurrence of the tumor noticed in one bitch which may be resulted from large size tumor (8cm). Moulton (1) found that when the tumor is less than 3cm in size the recurrence rate is relatively low, versus greater than 3cm has a fairly high recurrence rate, while (19), indicated that normal mammary tissue and a majority of tumors

express both estrogen and progesterone receptors, also 50% of mammary carcinomas express either of these receptors. Recurrence treated by re-operation in addition we performed spaying with best result. Millanta *et al* ., (20) stated that bitch spayed before the first heat cycle there is about a 0% chance that it will develop mammary tumors. The risk of developing mammary tumors increase with each successive heat of the bitch, thus one heat cycle (0-5%), two heat cycles (8%) and three heats cycle (26%).

Death of one operative case, three months post-surgery, and when performed post-mortem, we found metastases of the tumor to the lung. Greenacre, (21) refers that mammary tumors can metastasize to regional lymph nodes such as inguinal lymph node. Metastases can continue to pudendal and the internal iliac lymph nodes causing pressure and stenosis of colon. In some instances carcinoma is metastasized to the lung.

Upon collecting clinical tumor samples, the decision as to which tissue specimen is chosen for further examination is based on macroscopic and palpatory inspection and is consequently prone to error. Therefore, histopathological examination is an important prerequisite for successful generation of reproducible data. In order to take this into account, we examined each of sections used in the study histopathologically by using a randomized selection protocol for the section portions analyzed.

The main histopathological findings showed that there is a breakdown of lobular pattern with all signs of histologic criteria of malignancy and formation of extensive fibrous stroma and that agreed with (1) who described the main histologic features in adenocarcinoma in dog, in which the infiltrating cells are arranged as small tubules in about 50% of the tumors, as solid tubules with or without necrotic centers in 25%, as thin cords of cells or cells infiltrating individually mucin-producing cells in less than 1%. In conclusion although surgery is an old method of treatment of the tumor. Its use in the present study provided successful outcome.

تقييم عملية الإزالة الجراحية للغدة اللبنية المصابة بالسرطان في أنثى الكلاب

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الخلاصة

استهدفت الدراسة تقييم الإزالة الجراحية للأورام السرطانية في الغدد اللبنية لإناث الكلاب خلال فترة ثلاث سنوات امتدت من آذار - 2007 إلى آذار 2010 حيث عولجت (17) حالة لإناث كلاب وردت إلى فرع الجراحة-كلية الطب البيطري-بغداد، وكانت مصابة بسرطان الغدة اللبنية، شخّصت الحالات بالاعتماد على تاريخ الحالة والأعراض السريرية بالإضافة إلى الصور الشعاعية للتأكد من انتقال الآفة إلى أعضاء أخرى من الجسم كذلك اعتمد الفحص النسجي - المرضي لتحديد نوع الورم السرطاني. عولجت كافة الحالات جراحياً وتحت تأثير التخدير العام وهو مزيج الكيتامين - الزايلزين مسبقاً بكبريتات، حيث حقنت جميع العقاقير بالعضلة.

حصلت بعض المضاعفات الجراحية بعد إكمال التداخل الجراحي في سبعة حيوانات من أصل 17 حيوان. أظهر الفحص النسجي - المرضي للعينات المأخوذة من الورم (Adenocarcinoma) وهو من الأورام الخبيثة.

يمكن الخلاصة إلى القول بأن التداخل الجراحي أعطى نتائج مشجعة رغم المضاعفات الثانوية التي حصلت لبعض الحيوانات والتي استجابت جميعها للعلاج عدا حالة النفوق.

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