Bangladesh Journal of Veterinary and Animal Sciences, Vol. 8, No. 1, January-June 2020

ISSN 2227-6416

Bangladesh Journal of Veterinary and Animal Sciences

Journal homepage: www.bjvas.com

Case Report

Diagnosis and surgical management of mammary adenocarcinoma in a bitch

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A R T I C L E I N F O

Article history:
Received:
Accepted:

Keywords:

Cytopathology, Dog, Mastectomy, Mammary adenocarcinoma.

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A B S T R A C T

Surgical management is considered as primary option for treatment of mammary tumors in dogs in worldwide. A nine-year-old intact (unsprayed) female German Shepherd dog was brought to SAQ Teaching Veterinary Hospital at Chattogram Veterinary and Animal Sciences University, Bangladesh, with a history of gradually enlargement of L-5 mammary gland since last two months. Clinical examination revealed that the dog was active and alert; there was no swelling of prescapular and inguinal lymphnodes but the L-5 mammary gland had an elongated, well capsulated hard mass with irregular borders. Complete cell count, serum biochemistry, radiograhpy and cytopathology were performed. Mild neutrophilia and lymphopenia were observed in differential leucocyte count. Cytopathological features included hypercellularity, anisocytosis, anisokaryosis, coarse chromartin with one or more prominent nucleoli and high nuclear cytoplasm ratio as considered as mammary adenocarcinoma. To justifying the above clinical reports, L-5 mastectomy was considered. Mastectomy was performed successfully under general anaesthesia. The surgical wound was healed within 10 days and there was no evidence of any swelling or recurrence of tumor upto 6 months of post-surgery.

To cite this paper: *T. Paul, S. Biswas, S. Z. T. Bristi, M. S. Pallab and B. C. Das, 2020. Diagnosis and surgical management of mammary adenocarcinoma in a bitch. Bangladesh Journal of Veterinary and Animal Sciences (BJVAS), 8(1):143-146.*

1. INTRODUCTION

The mammary gland tumors are the most frequent progressive neoplasms in dogs and represent a great problem in small animal practice (Misdrop, 2002; Sontas et al., 2009; Al-Akraa et al., 2015). Tumors of canine mammary gland comprise between 25 to 50 percent of all the neoplasms and approximately 50% of mammary tumors frequently show malignancy in bitch (Allen et al., 1986; Sangha et al., 2011). The incidence of developing mammary tumors in bitch is greater in 9 to 12 years of age than early age (Sontas et al., 2009). The intact female dogs are more susceptible to mammary gland neoplasms than spayed dogs (Marconato et al., 2009; Ežerskytė et al., 2011). Considering the high incidence of occurrence, quick spreading nature of growth and poor survival capability of animal, a rapid and early diagnosis is necessary for mammary neoplasms in dog (Sangha et al., 2011). Cytology is one of the very easy, rapid,

inexpensive and minor painful methods for diagnosis of mammary tumor. In this method, the implantation of neoplastic cells is very rare and also shows good diagnostic value (Engzell et al.,1971). The diagnostic accuracy of tumor has resulted about 99% associated with combination of cytology, radiography and clinical examinations (Sangha et al., 2011). Mastectomy is widely considered as gold standard for treatment of mammary tumors in dogs (Papazoglou et al., 2014). It is very effective therapy to control local tumors in dogs except inflammatory carcinoma and distant metastasis (Marconato et al., 2009; Soremno et al., 2013). The aim of this report is to describe cytopathological features as well as surgical management of mammary adenocarcinoma in dog.

2. CASE HISTORY AND OBSERVATION

An intact female German Shepherd dog aged 9 years having 32 kg body weight with a good (3/5) body condition score was presented to the Teaching Veterinary Hospital, Chattogram Veterinary and Animal Sciences University (CVASU), Bangladesh. The primary complaint of the owner was gradually enlargement of L-5 mammary gland since last two months. Physical examination revealed that the bitch was active and alert, normal temperature (101˚F), heart rate (85/min.) and respiration rate (22/min.), pink and moist mucous membranes, with <2 sec capillary refill time (CRT) and also found an elongated, well capsulated hard mass with irregular borders of L-5 mammary gland about 17 cm. long (Figure 1). Hematological and bio-chemical profiles included total erythrocyte count (5.5×10^6/µL), hemoglobin (13 g/dl), PCV (41.4%), neutrophilia (90%), mild lymphopenia (7%), mild hypoproteinaemia (5.1 g/dl), alanine amino transferase (80.76 U/L), aspartate amino transferase (37.54 U/L) and alkaline phosphatase (70.23U/L). Cytopathological findings revealed clusters of neoplastic epithelial cells, hypercellularity, anisocytosis, anisokaryosis, coarse chromatin with one or more prominent nucleoli and high nuclear cytoplasm ratio (Figure 2). No metastasis was found in inguinal lymphnodes and lungs followed by cytology and radiographic examination (Figure 3) respectively. After justifying the above clinical reports, the case was diagnosed as a mammary adenocarcinoma and recommended to perform mastectomy in bitch.

Figure 1: L-5 mammary adenocarcinoma and measuring the size of tumor.

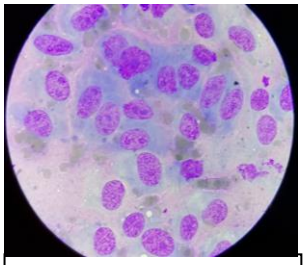

Figure 2: Cytopathology of mammary adenocarcinoma (hypercellularity, pleomorphism, coarse chromatin with one or more prominent nucleoli; Wright-Giemsa stain. 100X).

Figure 3:Radiographic examination- no evidence of any pathologic lesions.

3. ANAESTHESIA AND OPRATIVE TECHNIQUE

The patient was fasted about 6 hours prior to surgery. Shaving was performed on surgical area and prepared the patient aseptically by using 7.5% providone iodine and 70% alcohol. Xylazine hydrochloride (1mg/kg, xylaxin@, Indian Immunologicals Limited, India) was administered intramuscularly at the dose rate 1.0 mg/kg body weight as a pre-medicating agent. The patient was kept in ventro-dorsal position on operative table and 5% dextrose saline was infused intravenously at slow rate. Ketamine hydrochloride (Ketalar @, Popular Pharmaceuticals Limited, Dhaka) was considered as general anaesthetic intravenously at the dose rate 8mg/kg body weight. An elliptical incision was made on skin tissue around the mammary tumor with 2 cm. margins of healthy tissues. A blunt dissection was placed on subcutaneous tissue continuing upto external

abdominal wall by elevating the skin cranially and traction was applied caudually. Hemorrhage was controlled by applying electocauterizer. After ligating the caudal superficial epigastric vessels, external pudental vessels and others superficial vessels, the mammary tumor was excised (Figure 4) with underlying affected tissues. The surgical wound was lavaged with normal saline solution and assessed whether any tumor tissue presented. The surgical wound was closed by suturing of muscle layers (Figure 5), fascia and subcutaneous tissues with simple continuous sutures using sterile absorbable 1/0 catgut suture materials. Finally, the skin edges were sutured with cross mattress pattern by using non-absorbable suture materials (Figure 6). The wound was covered by a sterile pad after application of topical ointment povidone iodine and then applied a bandage.

Post-operative treatment of the patient included antibiotics ceftriaxone (30mg/kg, Triject vet[@], SK+F Pharmaceuticals Limited, Dhaka; intramuscular once daily for 7 days); an analgesic, meloxicam (0.3mg/kg, Mel vet[@], ACME Pharmaceuticals Limited, Dhaka; subcutaneously once daily for 3 days) and an antihistamine, pheneramine meleate (0.3mg/kg, Allerin[@,] SK+F Pharmaceuticals Limited, Dhaka; intramuscular once daily for 7 days). Simultaneously cold application was advised three times daily for 3 days and reviewed the patient at different interval.

Figure 4: Removal of tumor.

Figure 5: Closed the muscle layers by simple continuous suture.

Figure 6: Closed the skin by cross mattress sutures.

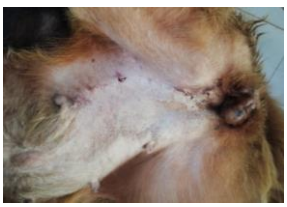

Figure 7: Stitches removed at 10th postoperative day.

Figure 8: No recurrence of tumor in 6 months of post-operative observation.

4. RESULTS AND DISCUSSION

The cytopathological features of this study revealed clusters of neoplastic epithelial cells with hypercellularity, pleomorphism, naked cells with coarse chromatin, one or more prominent nucleoli and high nuclear cytoplasm ratio. These features considered as mammary adenocarcinoma. Similar findings were reported by Mouriquand et al., 1986; Simeonov and Stoikov, 2006; Simon et al., 2009; Sangha et al., 2011)

The present case study, affected dog was intact and 9 years old that factors are susceptible for mammary tumor. Similar factors are also mentioned by Sontas et al. (2009), Ežerskytė et al. (2011). The mammary tumor was excised successfully by single mastectomy of L-5 mammary gland with underlying affected tissues. Surgical wound was healed without any wound complications (Figure 7) and there was no evidence of recurrence of tumor in any adjacent mammary gland until six months of post-operative observations (Figure 8). Similarly, single or regional mastectomy also was performed in case of mammary adenocarcinoma that was reported by Papazoglou et al. (2014); Al-Akraa et al, (2015). Stratmann et al. (2008) reported that 58% recurrence of benign and malignant tumor were ranged from 1 to 60 months after 1st surgery where excision of single mastectomy was performed in 99 female dogs.

5. CONCLUSIONS

The clinical case study concluded that cytology is a very easy, rapid, inexpensive and most useful method to diagnose neoplasms in veterinary practice. The surgical management of mammary tumor is recommended based on cytological

features and radiographic examination. The radical surgery, mastectomy is the best option for mammary adenocarcinoma treatment.

ACKNOWLEDGEMENTS

The authors are grateful to the pet owner for well cooperation by providing valuable information and postoperative follow up until six months. The authors also grateful to Director of Clinics, CVASU, for all kinds of technical supports to successfully perform this work.

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