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Clinical case

Presence of mastocytoma in auricular pavilion in a canine

Angélica Olivares–Muñoz*[1]; Paloma Cervantes-Pérez[2]; David A. Vanegas-Casallas[2]; Miguel Canales-Rubio[1]; José Luis Bravo-Ramos[1]; Teresa Espín-Iturbe[1].

[1]Universidad Veracruzana, Facultad de Medicina Veterinaria y Zootecnia de la Universidad Veracruzana. Hospital Veterinario de Pequeñas Especies. Veracruz, México.
[2]Hospital Veterinario One Vet, Departamento de Medicina Interna. Guanajuato, México.
*Correspondencia: aolivares@uv.mx

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ABSTRACT

Cutaneous and subcutaneous mast cells tumor are neoplasms composed of mast cells that are part of the skin in canines. It is a very common tumor and the treatment is focused on the aggressiveness that it may present. Sometimes it can be limited to local treatment, but if there are metastases, the prognosis can be favorable. Tumor staging is of great importance to give a diagnosis, treatment and prognosis for those patients affected by this pathology. In this work, we present the clinical case of an 11-year-old German shepherd canine with the presence of an ulcerated mass in the right auricle. The diagnosis was made by cytology and histopathology of canine mastocytoma grade II and low malignancy according to Pakiel's classification. The patient underwent a partial resection of the auricle with the presence of clean borders in the histopathological results. This is the first report of the presence of canine mastocytoma in the pinna in a canine.

Keywords: Canine; mastocytoma; skin (*Source: NLM*).

RESUMEN

Los mastocitos cutáneos y subcutáneos son neoplasias compuestas por mastocitos que forman parte de la piel en los caninos. Es un tumor muy común y el tratamiento va enfocado a la agresividad que pudiera presentar. Ocasionalmente se puede administrar un tratamiento local, sin embargo, este no debe considerarse en pacientes con metástasis. La estadificación del tumor es de gran importancia para dar un diagnóstico, tratamiento y pronóstico para aquellos pacientes afectados por esta patología. En este trabajo se presenta el caso clínico de un canino Pastor Alemán de 11 años con la presencia de una estructura ulcerada en el pabellón auricular derecho. Se realizó diagnóstico por citología e histopatológico de mastocitoma canino grado II y baja malignidad de acuerdo con la clasificación de Pakiel. Al paciente se le realizó una resección parcial del pabellón auricular con presencia de bordes limpios en los resultados del estudio histopatológico. El objetivo de este trabajo es reportar un caso clínico con la presencia de mastocitoma en el pabellón auricular en un perro doméstico.

Palabras clave: Canino; mastocitoma; piel (*Fuente: NLM*).

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INTRODUCTION

Canine mastocytoma (CM) is considered one of the most frequent malignant tumours in dogs. They are round cell tumours, with neoplastic proliferation of mast cells influenced by mutations, deletions and duplications, which implies carcinogenesis in its biological behaviour (1). The dog breeds frequently observed with this pathology are Boxer, Bulldog, Boston Terrier, Cocker Spaniel, Shar-Pei, and Golden Retriever (2). The onset of his pathology occurs from seven months to eighteen years of age, with a mean age of eight years (3). Most of these tumours occur in the skin, originate from the dermis, and extend to the subcutaneous tissue. However, others are limited to subcutaneous fat and visceral organs (4).

Generally, the trunk and the perineal region are the most affected, followed by the limbs and, less frequently, by the head and neck (5). It is common to observe them as single masses and may be more aggressive, accounting for 20 to 50% of cases (6). This way, 6.3% of dogs can exhibit mastocytoma cells as a primary tumour in the gastrointestinal area, liver and spleen (7).

The degree of histological differentiation continues to be the most important predictive technique for the prognosis in dogs, determining metastatic potential, treatment, and prognosis based on the morphological characteristics (5). Before 2011, the classification of malignancy used in veterinary medicine was that proposed by Patnaik (8), which had three categorisations, namely: well; intermediate; and poorly differentiated, which were called GI, GII and GIII.

Until today, histological classification can provide information on the metastatic potential, but it does not allow determining biological behaviours. This way, molecular screening methods, proliferation markers (Ki67, AgNORs, PCNA and KIT) and detection of the active mutation of the c-KIT gene by RT-PCR (3) are needed to obtain complete characterisations.

The prognosis of the disease can be low or highly aggressive, which leads to death (9). It has been demonstrated that dogs with high-grade solitary mastocytoma have had favourable prognoses (10). Therefore, the goal of the present study was to report and describe the clinical case of canine mastocytoma in an isolated area such as the auricle, but little observed in domestic dogs.

Presentation of the clinical case

An 11-year-old, non-neutered male German shepherd dog was brought to consultation. The owner reported a clinical history stating that he had noticed a decrease in physical activity, in addition to having observed a wart on the right auricle without pain during handling. No abnormalities were found by means of general physical examination. The dog did not exhibit any enlargement of the lymph nodes. The dermatological examination on the right auricle indicated a non-displaceable, painless mass of 0.5 cm in diameter. At that time, it was decided not to perform further examinations. Four months later, the dog was brought to the clinic again. The mass was nodular, firm, haemorrhagic, ulcerated, pink, and had grown to 1.9 x 1.7 x 1.2 cm in dimensions, i.e., now rapidly growing (Figure 1a). When handling it, the patient exhibited intense pruritus. Fine-needle puncture was performed for cytological assessment.

The cytological diagnosis indicated a clean background with abundant cellularity composed of discohesive neoplastic round cells or arranged in small groups. They presented moderate to abundant cytoplasm with well-defined edges, ovoid nucleus, with fine granular chromatin and occasional evident nucleoli. In some cells, it was possible to observe scant intracytoplasmic metachromatic fine granules, and loss of nucleus relationship: cytoplasm; anisocytosis; anisokaryosis; binucleosis; and multiple nucleoli (Figure 2a).

Subsequently, chemical studies, blood biometry and urine analysis were performed, indicating no apparent changes. Chest X-ray and abdominal ultrasonography examinations were performed prior to the surgical procedure without apparent radiological and ultrasonographic changes. Then, the surgical procedure was performed extracting the structure of the auricle and submitting it for histopathological examination.

The auricle was partially removed, with edges approximately of 1.5 cm lateral x 2 cm wide of healthy tissue, including the mass (Figure 1b). The post-operative period was managed with cephalexin antibiotic (30 mg/kg, BID), and a single dose of dexamethasone (1mg/kg, BID) intravenously. The mass was submitted for histopathological examination. The results of the microscopic examination indicated that

the area of the dermis was expanded and replaced by an undefined neoplastic tissue, composed of round cells arranged in cords, supported by fibrocollagenous stroma that caused fragmentation of the collagen fibres. They exhibited moderate cytoplasm with well-defined edges, and ovoid and euchromatic nucleus (Figure 2b). Some contained scant fine metachromatic granules (mast cells). They exhibited slight anisocytosis, anisokaryosis, nuclear pleomorphism, and a 0-2 mitotic count was performed. The morphological diagnosis was "low grade (Kiupel); grade-II cutaneous mastocytoma (Patnaik)". The edges sent to the histopathological examination were clean.

Figure 1. (a) Presence of ulcerated mastocytoma in the right auricle of a dog; (b) Partial surgical resection of the tumour in the auricle.

Abdominal ultrasonography and chest X-rays were performed without apparent ultrasonographic and radiological changes. The dog was brought for a follow-up consultation six months later. There was no presence of a mass in the auricle, and blood chemistry and biometry had no alterations.

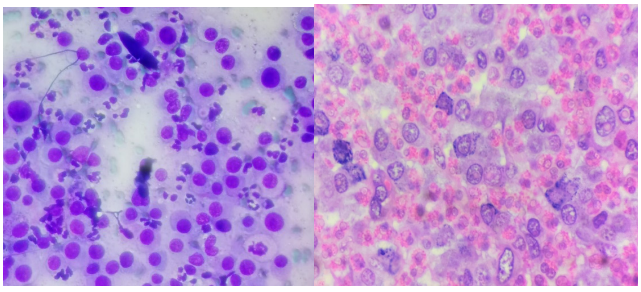

Figure 2. (a) Cytological examination of the mass in the auricle with Giemsa staining. A population of round cells with loss of relationship between the nuclei is observed; (b) Histopathological examination indicating proliferation of round cells with nuclei and cytoplasmic granulation. Haematoxylin and eosin staining (100x objective).

DISCUSSION

Canine mastocytoma occurs in subcutaneous and cutaneous tissues.[9] The frequency varies depending on the area. In the region of the trunk and the perineal, inguinal and genital areas it can be observed in 50% of cases, followed by the limbs with 40%, and the region of the head with 10 to 19% (9,11). Venkervan and Van der Gaag (12) showed that the most common tumours in the auricles were histiocytomas, sebaceous adenomas, fibromas, and nonspecific sarcomas. The reasons for the development of neoplasms in the external ear are related to the presence of permanent wounds on the tissue (13), as well as chronic inflammation and irritating substances, representing an important risk factor for the presence of benign and malignant tumours such as mastocytoma cells (14). Although the owners did not report ear problems, some type of damage and chronic inflammation prior to the appearance of the mass could not be ruled out. On its surface, the auricular region of the cartilage has a thin layer of highly condensed connective tissue where mastocytoma cells are present, thus allowing the presence and proliferation of tumours (15).

The metastatic potential varies between the correct differentiations in the histopathological classification, presenting less than 10% in well-differentiated mast cells (9). In the present study, the cytological assessment indicated little differentiation, but the presence of the tumour was confirmed by the histopathological examination. Radiological and ultrasomographic images did not show the presence of metastases in lymph nodes, thorax, or in organs such as the spleen and liver, neither in the pre-surgery nor in during follow-up.

Part of the treatment and favourable prognosis is the removal of the tumours with a lateral margin of up to 4 cm and a deep facial layer, previously staged between grade 1 or 2, presenting low recurrence (4%). When they are classified as high grade, recurrence rises to 36% (11). In the case of the auricle, the recommendation is to perform total cartilage ablation (12). In the patient of the present study, the removal was performed partially, covering the edges (lateral = 1.5 cm; width = 2 cm) around the mass. Chu et al (16) stated that there was no statistically significant difference between 3 cm wide lateral surgical edges and those ≥2 cm. In the present study, the histopathological report confirmed the presence of edges free of tumour cells. Although

a favourable result was obtained, the suggestions of Pratschke et al (11) should be taken into consideration. In this case, the decision to implement these measures was made because the goal was to have fewer complications and less post-surgical pain. However, if the area allows it, edges free of tumour cells should be ensured with wider surgical edges.

In conclusion, although the first differential diagnosis of tumours in the auricles of dogs is histiocytoma, in the present study the presence of mastocytoma cells was reported, which is a very common malignant tumour, though rarely observed in this area. Therefore, it is important to conduct further cytological and histopathological studies in the presence of tumours of this category for a diagnosis and treatment with better prognosis for patients.

Conflict of interests

The manuscript was prepared and reviewed with the participation of all the authors, who declare that there is no conflict of interest that can jeopardise the validity of the results presented.

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REFERENCES

1. Downing S, Chien MB, Kass PH, Moore PE, London CA. Prevalence and importance of internal tandem duplications in exons 11 and 12 of c-kit in mast cell tumors of dogs. Am J Vet Res. 2002; 63(12):1718-23. https://doi.org/10.2460/ajvr.2002.63.1718

2. Bellamy E, Berlato D. Canine cutaneous and subcutaneous mast cell tumours: a narrative review. J Small Anim Pract. 2022; 63(7):497-511. https://doi.org/10.1111/jsap.13444

3. Oliveira MT, Campos M, Lamego L, Magalhães D, Menezes R, Oliveira R, et al. Canine and feline cutaneous mast cell tumor: A Comprehensive Review of Treatments and Outcomes. Top Companion Anim Med. 2020; 41. https://doi.org/10.1016/j.tcam.2020.100472

4. Salvi M, Molinari F, Iussich S, Muscatello LV, Pazzini L, Benali S, et al. Histopathological classification of canine cutaneous round cell tumors using deep learning: A Multi-Center Study. Front Vet Sci. 2021; 26(8):640944. https://doi.org/10.3389/fvets.2021.640944

5. Śmiech A, Ślaska B, Łopuszyński W, Jasik A, Bochyńska D, Dąbrowski R. Epidemiological assessment of the risk of canine mast cell tumours based on the Kiupel two-grade malignancy classification. Acta Vet Scand. 2018; 60(1):70. https://doi.org/10.1186/s13028-018-0424-2

6. Rinaldi V, Crisi PE, Vignoli M, Pierini A, Terragni R, Cabibbo E, et al. The role of fine needle aspiration of liver and spleen in the staging of low-grade canine cutaneous mast cell tumor. Vet Sci. 2022; 9(9):473. https://doi.org/10.3390/vetsci9090473

7. Brown M, Hokamp J, Selmic L E, Kovac R. Utility of spleen and liver cytology in staging of canine mast cell tumors. J Am Anim Hosp Assoc. 2022; 58(4):168–175. https://doi.org/10.5326/JAAHA-MS-7006

8. Patnaik AK, Ehler WJ, Macewen EG. Canine cutaneous mast cell tumor: morphologic grading and survival time in 83 dogs. Vet Pathol. 1984; 21(5):469–474. https://doi.org/10.1177/030098588402100503

9. de Nardi AB, Dos Santos Horta R, Fonseca-Alves CE, de Paiva FN, Linhares LCM, Firmo BF, et al. Diagnosis, Prognosis and Treatment of Canine Cutaneous and Subcutaneous Mast Cell Tumors. Cells. 2022; 11(4):618. https://doi.org/10.3390/cells11040618

10. Berlato D, Bulman-Fleming J, Clifford CA, Garrett L, Intile J, Jones P, et al, Limitations and Recommendations for Grading of Canine Cutaneous Mast Cell Tumors: A Consensus of the Oncology-Pathology Working Group. Vet Pathol. 2021; 58(5):858-863. https://doi.org/10.1177/03009858211009785

11. Pratschke KM, Atherton MJ, Sillito JA, Lamm CG. Evaluation of a modified proportional margins approach for surgical resection of mast cell tumors in dogs: 40 cases (2008-2012). J Am Vet Med Assoc. 2013; 243(10):1436-1441. https://doi.org/10.2460/javma.243.10.1436

12. Vernker-Van HAJ, Van DGI. Tumors of the external ear. Vet Q. 1998; 20(1):S7. https://doi.org/10.1080/01652176.1998.10807380

13. Molino-Díaz VM. Adenocarcinoma de glándulas ceruminosas en un canino: reporte de caso. Rev Med Vet. 2018; (37):95-102. https://doi.org/10.19052/mv.vol1.iss37.11

14. Ríos A. Mastocitoma canino y felino. Clín Vet Peq An. 2008; 28(2):35-142. https://ddd.uab.cat/pub/clivetpeqani/11307064v28n2/11307064v28n2p135.pdf

15. Álvarez CF, Castro I, Álvarez F. Dermatología en perros y gatos. México: Ed. Jaiser; 2001.

16. Chu ML, Hayes GM, Henry JG, Oblak ML. Comparison of lateral surgical margins of up to two centimeters with margins of three centimeters for achieving tumor-free histologic margins following excision of grade I or II cutaneous mast cell tumors in dogs. J Am Vet Med Assoc. 2020; 256(5):567-572. https://doi.org/10.2460/javma.256.5.567