

A disseminated cutaneous plasmacytoma case in a dog

Burçak ÖZKAN^{1*}, Sinem ÜLGEN², Funda YILDIRIM³, Ali Rıza KIZILER⁴, Kürşat ÖZER⁵,
Mehmet Erman OR², Aydın GÜREL³, Ümit Bora BARUTÇU⁶, Hazım Tamer DODURKA²

¹International Pet Hospital Sauk, Tirana, Albania

²Department of Internal Medicine, Faculty of Veterinary Medicine, İstanbul University, İstanbul, Turkey

³Department of Pathology, Faculty of Veterinary Medicine, İstanbul University, İstanbul, Turkey

⁴Department of Biophysics, Faculty of Medicine, Namık Kemal University, Tekirdağ, Turkey

⁵Department of Surgery, Faculty of Veterinary Medicine, İstanbul University, İstanbul, Turkey

⁶Department of Biophysics, Cerrahpaşa Faculty of Medicine, İstanbul University, İstanbul, Turkey

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Abstract: A 5-year-old mixed-breed dog presenting with diffuse lesions was diagnosed with cutaneous plasmacytoma. Sites where tumors occurred most often involved the skin of the facial areas, as well as that of the shoulder, neck, and back of the body. No systemic findings were present in spite of a significant enlargement of the lesions. The tumors varied in diameter, the largest being 5–10 cm. Tissue samples obtained from tumoral masses were fixed in 10% formalin, processed routinely, embedded in paraffin, cut into sections of 4–5 µm, and stained with hematoxylin and eosin. To determine the nature of the tumoral cells, kappa and lambda light chain antibodies were applied to the paraffin sections immunohistochemically. The tumor was diagnosed as cutaneous plasmacytoma according to its morphological and microscopical properties. Tumor cells displayed features of asynchronous plasmacytoma. The patient was cured by medical treatment. The disease and the chemotherapy procedure ended with a favorable prognosis and are discussed here due to the rarity of such cases.

Key words: Dog, cutaneous plasmacytoma, kappa and lambda light chains, immunohistochemistry

1. Introduction

Plasmacytomas (being plasma cell tumors) and cutaneous plasmacytomas have been generally misclassified. Because of their morphologic and clinical similarities, most cutaneous plasmacytomas were likely to have not been included in accounts of cutaneous neoplasia in dogs (1,2). With our report, we describe a disseminated asynchronous canine cutaneous plasmacytoma with diffuse multiple lesions, since any dog having such a tumor is suggested to be screened because of the mentioned tumor's rarity.

2. Case history

Our patient was a 5-year-old male stray dog referred to the Department of Internal Medicine due to multiple lesions of different sizes.

Ulcerative, exudative, and hemorrhagic diffuse lesions with diameters varying from 5 to 10 cm were observed in our patient. They were commonly seen in buccal, ocular, and auricular areas, while the distribution was denser in the skin of the neck, shoulder, and back of the

body (Figures 1–3). Anamnesis revealed that the lesions were getting bigger and more diffuse, although they were neither pruritic nor painful.

Problems related to appetite, water intake, micturition, or defecation were not present. Additionally, there were no systemic complaints. A distinct cachexia was of interest. After a general examination, blood, serum, and urine analyses were evaluated and samples from feces and skin were sent to the appropriate departments for parasitological, microbiological, and histopathological examination.

Both radiologic and ultrasonographic examinations were performed in order to control the presence of any metastasis. Neither of them showed any results making us think so.

3. Results and discussion

Hematologic and blood serum values are represented in Tables 1–3. No anomaly was noticed via urinalysis.

Various *Streptococcus* species were isolated at the end of the bacteriologic examination.

* Correspondence: burcakozkan1974@yahoo.com



Figure 1. Ulcerative facial lesions due to the tumor with varying diameters.

In the macroscopic histological examination, both dermal and subdermal tissues and the extirpated mass revealed macroscopic encapsulated and multinodular structures, the largest of which was 5 cm. At the same time, the cut surfaces were gray-white. All the specimens obtained from the mass were processed routinely after being fixed in 10% formalin. Specimens were embedded in paraffin, sectioned at 4–5 μm , and stained with hematoxylin and eosin. On the basis of light microscopic examination, it was detected that plasma cells and cell groups consisting of 20–30 cells with plasmacytoid structure were surrounded by stromal tissue. Tumoral cells exhibited a pleomorphic structure, with large, eccentric, and densely basophilic nuclei with prominent nucleoli and variable nucleus/cytoplasm ratios (Figure 4). Additionally,



Figure 2. Disseminated lumbal lesions and lesions on the skin of the body.

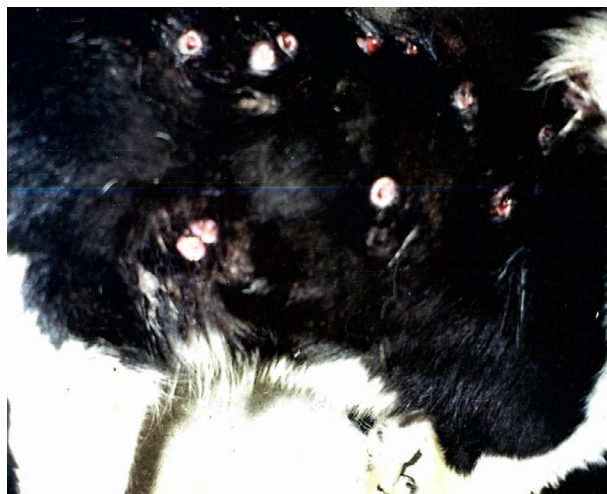


Figure 3. Disseminated ulcerative and hemorrhagic lesions of thoracic and lumbar areas.

a huge amount of mitotic figures were observed. For immunohistochemistry, sections were transferred to poly-L-lysine-coated microscope slides and stained according to the label streptavidin biotin method. Kappa light chains (DAKO, Denmark) and lambda light chains (DAKO) were used in order to detect the cellular characteristics of the tumor. Dog tonsil sections were used as a positive control. Positive controls showed strong reaction to both antibodies. Tumor sections showed positive reactions to lambda light chains in all areas and to kappa light chains, especially in peripheral areas where the tumor had infiltrated into healthy tissue. When comparing lambda and kappa light chain staining characteristics, lambda light chain positivity was notably reported (Figure 5). The cellular morphologic characteristics were reported to have features consistent with those previously described (1,2) for asynchronous plasmacytomas.

Tricyclic chemotherapy consisting of vincristine (vincristine sulfate), doxorubicin (doxorubicin HCl), and cyclophosphamide was applied (3,4). An antibiotic (amoxicillin) was also used. Complete recovery occurred at the end of a 1-month treatment. No side effects were noticed. Blood serum values were reevaluated following the treatment and were detected to reach normal values.

Canine plasmacytomas have been rarely reported and our patient exhibited an uncommon example of such disseminated lesions. Both their size and localization in our patient were striking compared to the classic literature (5).

Diagnosis of plasmacytoma confirmation is based on the presence of cytoplasmic immunoglobulins (6). The characteristics of dog plasma cells are the domination of lambda light chains (7). Both histopathological and

Table 1. Hemogram values of our patient before and after the treatment procedure.

Parameter/unit	Measured value before the treatment	Measured value after the treatment	Reference value
Red blood cells (10 ⁶ /mm ³)	7.8	8.2	5.5–8.5
White blood cells (10 ³ /mm ³)	14.7	12.4	6.0–17.0
Hemoglobin (g/dL)	12.1	13.7	12–18
Hematocrit (%)	44	40	37–55
Mean corpuscular volume (fL)	65	67	60–77
Mean corpuscular hemoglobin concentration (%)	36	34	32–36
Mean corpuscular hemoglobin (pg)	31	30	19.5–26

Table 2. Serum biochemistry values showing changes before and after the treatment.

Parameter/unit	Measured value before the treatment	Measured value after the treatment	Reference value
Aspartate transferase (IU/L)	76	50	5–55
Alanine transferase (IU/L)	101	54	5–60
Alkaline phosphatase (IU/L)	48	52	10–150
Total protein (g/dL)	5.2	5.4	5.1–7.8
Creatinine (mg/dL)	3.8	1.7	0.4–1.8
Urea (mg/dL)	70	22	7–27
Glucose (mg/dL)	70	75	62–125

Table 3. Serum mineral values compared before and after the treatment.

Parameter/unit	Measured value before the treatment	Measured value after the treatment	Reference value
Cu (µg/dL)	44.1	45.4	53.87 ± 17.41
Zn (µg/dL)	87.6	83.7	73.85 ± 24.04

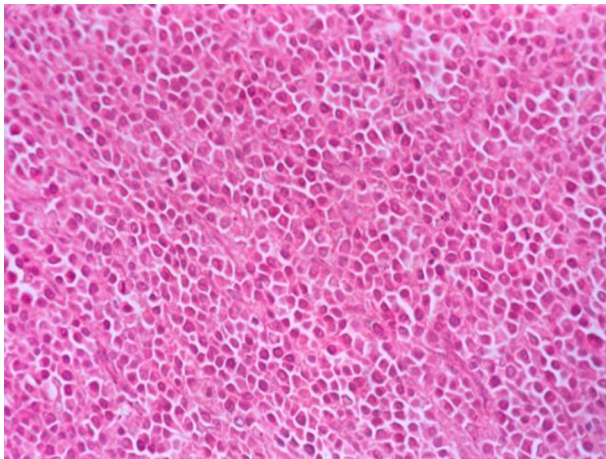


Figure 4. Tumoral cells that had large, eccentric, and densely basophilic nuclei with prominent nucleoli and variable nucleus/cytoplasm ratio, hematoxylin and eosin, 400×.

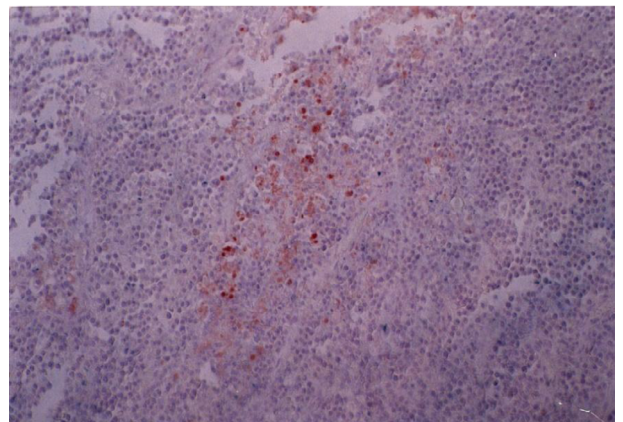


Figure 5. Positive staining with lambda light chain antibody, immunohistochemistry, 200×.

immunohistochemical findings for our patient's tumor were in concordance with previous data.

In spite of some researchers (8) defining blood parameter levels within normal limits, the mild increase in liver and kidney parameters was related to the poor living conditions of our patient before being brought to us, and appropriate treatment was planned.

Previous reports (9) explained that the risk of death from cancer is about 4 times higher for subjects with the highest serum levels of copper, despite there being no significant risk for those with low or high baseline levels of serum zinc. However, a protective effect of a high zinc status against the risk of cancer is accepted. Since the values of our patient for both parameters were accepted as being close to normal (10), we suggest that further investigation be organized in order to establish a better correlation between these parameters.

The cases are not accompanied by generalized symptoms unless organ infiltration is present. Our patient did not exhibit any infiltration, despite diffuse and large lesions. Both abdominal radiography and ultrasonography revealed that all internal organs' sizes and shapes were normal and they were not presenting any views of pathologic lesions. The cachexia was related to the tumors, as were the depression, the apathy, and the lameness. Oral plasmacytomas cause anorexia, vomiting, diarrhea, and gingivitis (11). Perlmann et al. (7) reported mucopurulent discharge, hyperemia, and corneal pigmentation in a dog with third eyelid gland plasmacytoma. Our patient did not manifest similar signs, in spite of the presence of lesions in ocular and oral cavity regions.

Chemotherapy being accepted as the most effective cure, the tricyclic chemotherapy applied in our case according to the literature (8,11) ensured total recovery without causing any side effects, and neither relapse nor similar symptoms of the disease were noticed (Figures 6 and 7).

Though plasmacytomas are well documented in humans, they remain misclassified and poorly reported in veterinary medicine, and the paucity of published articles makes it difficult to present detailed information. Since they are uncommon in dogs, careful morphologic assessment and therapeutic procedure organization are supposed to ameliorate the prognosis. This case report describes a canine-disseminated plasmacytoma and a favorable cure.



Figure 6. Frontal view after treatment, with complete recovery, free of lesions.

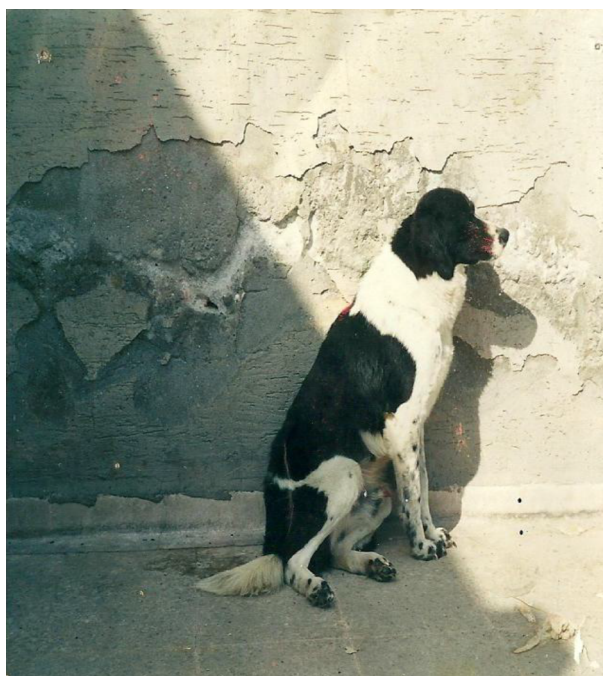


Figure 7. Lateral view after treatment with total recovery of both the body and facial area without any lesions.

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