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Intermammary mass in a 13-year-old intact female Spanish Alano dog

Keywords: dog, plasmacytoma, extramedullary, cutaneous, tumor

History

A 13-year-old intact female Spanish Alano was presented to the dermatology service of the Veterinary Hospital, School of Veterinary Medicine, Zaragoza, Spain, for evaluation of the presence of an intermammary cutaneous mass located on the left ventrocaudal area, which had been growing for several months.

Clinical and Gross Findings

At the initial physical examination, the dog was alert, with a bodyweight of 14 kg and body condition score of 3/5, normothermic, properly hydrated with pink mucous membranes. The dog's abdomen was distended without painful palpation, with absence of organomegaly or the presence of internal abdominal cavity palpable masses. Cardiac auscultation was within normal limits. Respiratory sounds were also normal, and there was no evidence of lymph node enlargement. On dermatological examination, 2 X 2 cm, erythematous and ulcerative nodular mass located on the left caudal intermammary zone was detected **(Figure 1)**. Different clinical pathology tests were performed including a CBC, complete serum biochemical profile, urinalysis, and serum protein electrophoresis. However, all parameters were within the reference ranges. Abdominal ultrasonography did not reveal the presence of abnormalities of the echogenicity in the abdominal organs.

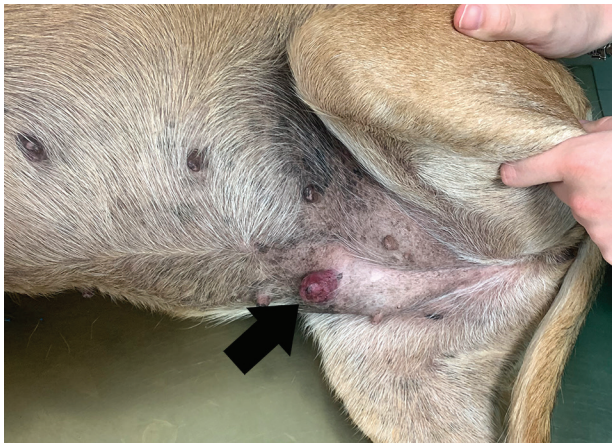

Figure 1—Photograph of an erythematous and ulcerative nodular cutaneous mass (arrow) of a 13-year-old intact female Spanish Alano detected during the physical examination.

Formulate differential diagnoses, then continue reading.

Cytologic and Histopathologic Findings

Fine-needle aspirate preparations were submitted for cytological evaluation. Microscopically, a high cellular population of round cells was observed, with discrete cell borders and no intercellular junctions **(Figure 2)**. These cells were characterized by a moderate nuclear-to-cytoplasmic ratio. The nuclei were rounded and generally located eccentrically or toward 1 cellular pole, displaying a pattern of thick chromatin and inconspicuous nucleoli. Moreover, the presence of anisocytosis and anisokaryosis was detected. Numerous binucleated, trinucleated, and even multinucleated cells were observed (Figure 2). The cytoplasm was basophilic, devoid of any granulation, and some cells showed a halo or clear/pale perinuclear area corresponding

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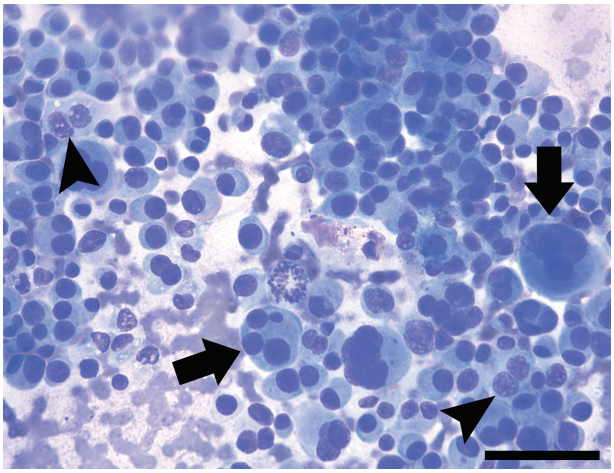

Figure 2—Photomicrograph of fine-needle aspirate preparations from the nodular cutaneous mass. There is a highly cellular population of round cells. Numerous multinucleated cells are observed (arrows). Dutcher bodies are detected in some nuclei of these cells (arrowhead). Modified Wright stain; bar = 100 µm.

to the Golgi zone. Dutcher bodies, intracytoplasmic rounded pale pseudo inclusions overlying the nucleus composed by excessive immunoglobulins, were detected in some of these cells (Figure 2). Occasionally, pink amorphous material interpreted as amyloid was observed.

Furthermore, an excisional biopsy was obtained to characterize the nature of the lesion. Tissues were fixed in 10% neutral buffered formalin and routinely processed. Histologically, a densely cellular mass expanding from the superficial dermis to the subcutaneous tissue was detected **(Figure 3)**, compressing the adjacent mammary tissue. The mass was moderately demarcated, non-encapsulated, expansile and densely cellular, composed of solid sheets of round cells and occasional packets with sparse fibrovascular stroma admixed (Figure 3). Cells showed discrete cell borders with moderate to abundant eosinophilic cytoplasm, round nucleus, coarsely stippled chromatin and small, round, central basophilic nucleolus. Anisocytosis and anisokaryosis were marked, with frequent multinucleated and occasional karyomegalic cells (Figure 3). Multifocally, multinucleated cells presented Dutcher bodies (Figure 3). Two mitoses in 2.37 mm^2 were detected. The mass did not involve the surgical margins in the sections examined.

Morphologic Diagnosis and Case Summary

Morphological diagnosis: subcutaneous tissue of left caudal intermammary zone, cutaneous plasma cell tumor (extramedullary plasmacytoma).

Comments

Plasma cells, originating from B lymphocytes in the bone marrow, are specialized cells that produce immunoglobulins. When these cells undergo neoplastic changes, they lead to the development of monoclonal plasmocytic tumors.[1] These neoplasms can manifest in various forms in canines, such as extramedullary plasmacytomas, solitary osseous plasmacytomas, and multiple myeloma, each exhibiting distinct characteristics.[1]

Plasma cell tumors often have distinct cytological features, such as a deep basophilic cytoplasm,

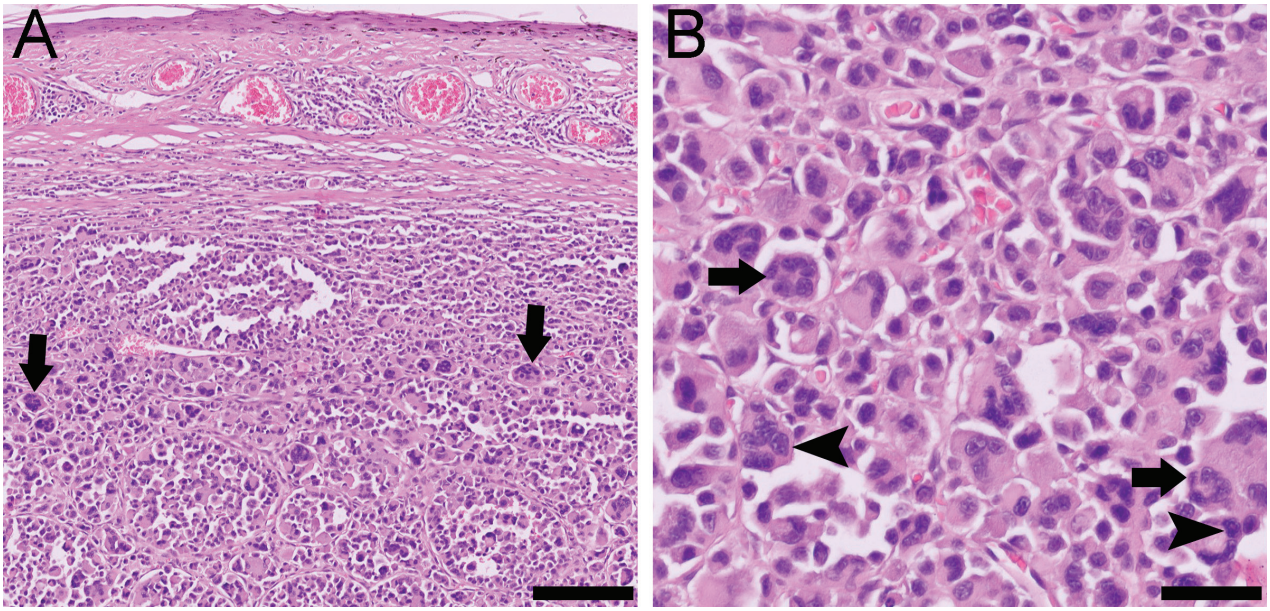

Figure 3—Photomicrographs of a biopsy from the nodular cutaneous mass. A—Expanding the dermis and elevating the overlying epidermis there is a mostly well-demarcated, unencapsulated and densely cellular neoplasia, composed by cells closely packed in sheets and islands surrounded by a thin fibrovascular stroma. Multifocally, there are multinucleated cells (arrows). H&E; bar = 300 µm. B—Numerous neoplastic cells are multinucleated (arrows) and show Dutcher bodies (arrowheads). H&E; bar = 100 µm.

an eccentric nucleus, and a perinuclear clear zone containing the Golgi zone. In this sense, diagnosis through fine needle aspirate cytology is usually straightforward.[2] However, in certain cases, histopathology, and specific immunohistochemistry such as multiple myeloma oncogene-1 (MUM-1), CD79a, and CD20 may be necessary to differentiate plasma cell tumors from other similar round cell neoplasms.[3] Additionally, PCR for antigen receptor rearrangement can confirm B-cell clonality, although the use of this molecular test is less commonly utilized and this technique would not allow it to be distinguished from lymphoma.[4]

In dogs, extramedullary plasmacytoma mainly develops in soft tissues including the skin (head, limbs, or trunk) followed by the mucous membranes of the oral cavity and the gastrointestinal tract such as the rectum and colon.[1] Extramedullary plasmacytoma often lacks associated clinical signs. Generally, cutaneous and oral plasmacytomas are regarded as having a benign nature, while gastrointestinal plasmacytomas tend to exhibit a more aggressive clinical progression.[1,2] However, there are exceptions to this pattern and, for instance, cutaneous plasmacytosis, characterized by multiple cutaneous plasmacytomas in the absence of multiple myeloma, tends to have a more aggressive course.[5] Since solitary cutaneous plasmacytomas generally demonstrate a benign nature, routine further investigations or staging are not typically undertaken. However, in instances where multiple masses raise concerns for cutaneous plasmacytosis or exhibit other features indicating a systemic myeloma-related disorder, additional investigations are warranted and will be addressed after the diagnosis.[5] In this case, described cutaneous plasma cell tumor clinical appearance should be differentiated from other neoplasms, such as mammary gland adenoma or adenocarcinoma, hemangioma/hemangiosarcoma or mast cell tumor, therefore mentioned diagnostic techniques are necessary to differentiate the cellular origin of the tumor.

This case provides an excellent clinicopathological example of a cutaneous plasma cell tumor in a rare anatomical location. As described, although there are multiple immunohistochemical and molecular techniques to identify extramedullary plasmacytomas, cytology and histopathology are necessary in the first steps of the diagnostic protocol.

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