

Extramedullary plasmacytoma in a captive collared peccary (*Pecari tajacu*)¹

Roberio G. Olinda^{2*}, Geysa A. Viana³, Carla M.F. Rodrigues³, Taciana M.F. Silva³,
Ricardo B. Lucena⁴, Francisco S.B. Bezerra³ and Jael S. Batista³

ABSTRACT- Olinda R.G., Viana G.A., Rodrigues C.M.F., Silva T.M.F., Lucena R.B., Bezerra F.S.B. & Batista J.S. 2016. **Extramedullary plasmacytoma in a captive collared peccary (*Pecari tajacu*)**. *Pesquisa Veterinária Brasileira* 36(6):516-519. Departamento de Ciências Animais, Universidade Federal Rural do Semi-Árido, BR-110 Km 47, Mossoró, RN 59625-900, Brazil. E-mail: rgumes@hotmail.com

An extramedullary plasmacytoma case in a captive collared peccary (*Pecari tajacu*) is reported. The animal, a female aging three years old, had a medical history of diffusely distributed skin and mucocutaneous junction lesions, associated with swollen lymph nodes. Clinical examination and complementary exams (complete blood count, biochemical analysis, skin scraping to search mites and fungal culture) were performed. Thirty days after examination, the animal died. At necropsy, multiple consistent nodules, aseptic pustules and swollen lymph nodes were found. On histological exams of the skin and oral mucosa, we observed a large number of round cells forming masses organized in nests, sheets, and cords of cells in a well-vascularized fibrovascular tissue. Neoplastic plasma cells infiltrated between the fibers and the lamina propria of smooth muscle. Spaces among the cell masses were filled with some eosinophil and fluid. Most of the cells were well differentiated, presenting a perinuclear clear zone. In some points, the cells were pleomorphic. The plasma cells presented eccentric, basophilic and spherical nuclei, showing a dense to organized chromatin with distinct nucleoli. Binucleate cells were observed, but multinucleated giant cells were rare. Oral mucosa and lymph nodes tested by immunohistochemical analyses were positive for Mb-1, with a multifocal distribution. In regard to Bcl-2, the neoplastic cells were intermittent weakly positive. So, an extramedullary plasmacytoma was diagnosed in the collared peccary considering the location, the histopathological and immunohistochemical findings.

INDEX TERMS: Collared peccary, *Pecari tajacu*, mucocutaneous plasmacytoma, immunohistochemistry.

RESUMO.- [Plasmocitoma extramedular em cateto criado em cativeiro (*Pecari tajacu*).] Um caso de plasmocitoma extramedular em cateto criado em cativeiro (*Pecari tajacu*) está sendo relatado. O animal, uma fêmea com três anos de idade, apresentou um histórico médico de lesões de pele, envolvendo junção mucocutânea e de aumento de linfonodos. Exame clínico e exames complemen-

tares (hemograma completo, análise bioquímica, raspado de pele para pesquisa de ácaros e cultura fúngica) foram realizados. Após 30 dias, o animal morreu. Na necropsia, verificou-se a presença de múltiplos nódulos, pústulas assépticas e aumento dos linfonodos. Na pele e mucosa oral, histologicamente as massas consistiam em ninhos, lençóis e cordões de células redondas, e um estroma fibrovascular bem vascularizado. Os plasmócitos foram observados infiltrados entre as fibras e músculo liso da lâmina própria. Espaços contendo eosinófilos, fluido e células livres estavam presentes na massa. A maioria das células estava bem diferenciada, com uma zona perinuclear clara, mas algumas células demonstraram-se pleomórficas. Os plasmócitos apresentavam núcleo excêntrico, redondo, basófilo, e pontilhado, com cromatina variando de densa a grosseiramente organizada e nucléolos distintos. O citoplasma

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² Programa de Pós-Graduação em Medicina Veterinária (PPGMV), Universidade Federal de Campina. Grande (UFCG), Campus de Patos, Patos, PB 58700-000, Brazil. *Corresponding author: rgumes@hotmail.com

³ Departamento de Ciências Animais, Universidade Federal Rural do Semi-Árido, BR-10 Km 47, Mossoró, RN 59625-900, Brazil.

⁴ Departamento de Ciências Veterinárias, Universidade Federal da Paraíba, Centro de Ciências Agrárias, Campus III, Areia, PB 58397-000, Brazil.

finamente granular de anfífilico para basofílico. As células foram interpretadas como plasmócitos neoplásicos. Células binucleadas foram observadas e células gigantes multinucleadas eram raras. Na imunohistoquímica de tecidos da mucosa oral e de linfonodos observou-se positividade moderada e multifocal para Mb-1. As células tumorais revelaram positividade fraca e intermitente para Bcl-2. Com base na localização, achados histopatológicos e imuno-histoquímicos, um plasmocitoma extramedular foi diagnosticado.

TERMOS DE INDEXAÇÃO: Cateto, *Pecari tajacu*, plasmocitoma mucocutâneo, imuno-histoquímica.

INTRODUCTION

Collared peccaries (*Pecari tajacu*) are members of the Tayassuidae family and inhabit deserts, arid savannahs, and forests spanning across the United States to Argentina. They face constant threats of deforestation and are victims of predatory hunting. In Latin-American countries, meat and pelt trading of this species are important for local economy. Thus, *Pecari tajacu* has been considered a suitable species for inclusion in the captive breeding programs (Bodmer et al. 1997). However, the occurrence of diseases is one barrier for the success in breeding of wildlife under captivity conditions. In addition, the knowledge of the most often diseases in collared peccaries could serve as basis to establish the prognosis, diagnosis and even protocols of treatment (Batista et al. 2011).

Neoplasms in wild animals have been a theme frequently discussed in the veterinary practice (Bertelsen et al. 2011, Guthrie & Maar 2011, Justin et al. 2011), especially because an improve in the longevity of the wild species raised under captive conditions was achieved during the last years (Cullen et al. 2002). Neoplasms can cause high levels of morbidity and mortality, and, efforts have been done to identify the predisposing factors (Ramond & Garner 2000). In spite of the increase in the number of studies involving neoplasm in wild animals, there is yet a lack of information about neoplasms in collared peccaries (*P. tajacu*). To our knowledge, few papers reported the condition in this species. Just a transitional cell carcinoma of the eye and a carcinoma in mammary gland were described, and reports of extramedullary plasmacytoma, considered a rare tumor, were not found (McCowan et al. 2002, Lee et al. 2009). Herein, we describe the clinical, pathological and immunohistochemical aspects of a mucocutaneous extramedullary plasmacytoma in a captive collared peccary.

MATERIALS AND METHODS

A female collared peccary (*Pecari tajacu*), aging three years old was used in this report. The animal belonged to the Centre of Multiplication of Wild Animals from Universidade Federal Rural do Semiárido, located in the Northeast of Brazil (Mossoró, RN, Brazil; 5°10' S, 37°10' W). Collared peccary had medical history of skin and mucocutaneous lesions, and enlarged lymph nodes. A complete physical examination was performed and blood samples were collected for determination of complete blood count (CBC) and biochemical analysis. Skin scraping was conducted, and the skin sample was used to search for mite under optical microscopy, and to streak on Sabouraud agar.

The animal was clinically accompanied, but died after thirty days. A necropsy was performed. Organs were removed and a complete macroscopic study was done, including photographic documentation of significant findings. Fragments of several organs were collected and fixed in 10% formalin, and processed for histology, embedded in paraffin, cut at 5µm and stained with hematoxylin-eosin (HE).

Samples from the oral mucosa and lymph node were processed by routine method for histopathological evaluation. Sections were stained with hematoxylin and eosin and immunohistochemistry (IHC) using streptavidin-biotin-peroxidase complex (Streptavidin-biotin-peroxidase complex, Dako, Carpinteria, California, United States of America) and 3,3'-diaminobenzidine (3,3'-diaminobenzidine, Sigma Chemical Co., St. Louis, Missouri, USA). For IHC the following antibodies were applied in proper dilutions on the tumor sections: anti-CD79a (clone JCB-117, 1:10 dilution, Dako), anti-20 (clone L26, 1:100 dilution, Dako), anti-Bcl-2 (clone 124, 1:100 dilution, Dako) anti-CD3 (clone SP7, 1:10 dilution, Abcam), and anti-CD4 (clone SP35, 1:10 dilution). IHC sections were counterstained with Mayer's hematoxylin. Multiple sections of tumor were evaluated by histochemical stained with Congo red.

RESULTS

On the physical examination, the collared peccary was thin, and presented pale mucous. The rectal temperature was 38.5°C, and the superficial lymph nodes were enlarged. On dermatological examination, we detected some pathological finds, such as: bilateral and symmetrical alopecia, skin crusts, multiple ulcerated nodules (distributed on the surface of oral mucous as well), pustules on the entire tegument, but more concentrated on the head, neck and thorax (Fig.1).

Collared peccary presented normochromic/normocytic anemia (mean globular volume of 17%), leukopenia, neutrophilia, lymphopenia and thrombocytopenia. The results of the biochemical analysis were 28g/dl for total protein, 3.0g/dl for albumin and 25g/dl for globulin. There was no mite on the analysis of the skin scraping, and no fungus was found in any sample collected.

At necropsy, we observed splenomegaly, swollen lymph nodes on the inguinal, parotid, axillary, infraclavicular and mesenteric regions. Surface of cut lymph nodes showed a soft and protuberant grayish white tissue. Histologically, the skin and oral mucosa masses consisted of nests, sheets, and cords of round cells in a fine and well-vascularized fibrovascular tissue (Fig. 2). Plasma cells were observed in-



Fig.1. Macroscopic aspect of the mucocutaneous extramedullary plasmacytoma in a captive collared peccary (*Pecari tajacu*). Alopecia, ulcers, skin crusts and nodules on the head and neck can be observed.

filtrating the region between the fibers and smooth muscle of the lamina propria. We observed spaces containing eosinophilic fluid and free cells throughout the mass. Most cells were well differentiated, with a perinuclear clear zone, but some cells were pleomorphic (Fig. 3). The plasma cells had eccentric, round, basophilic, and stippled nuclei with dense chromatin, but some cells exhibited vesicular or coarse chromatin and distinct nucleoli. The finely granular cytoplasm was amphophilic to basophilic. Cells were identified as being neoplastic plasma cells. Binucleate cells were observed and multinucleate giant cells were rare. Mitoses were viewed on average zero or one figure per high-powered field. Examination of the bone marrow sections do not revealed tumor cells. Small number of similar cells were visualized on superficial lamina propria of the blood vessels.

Cutaneous tissue sections stained with the Congo red method failed in demonstrating amyloid. Histopathologic

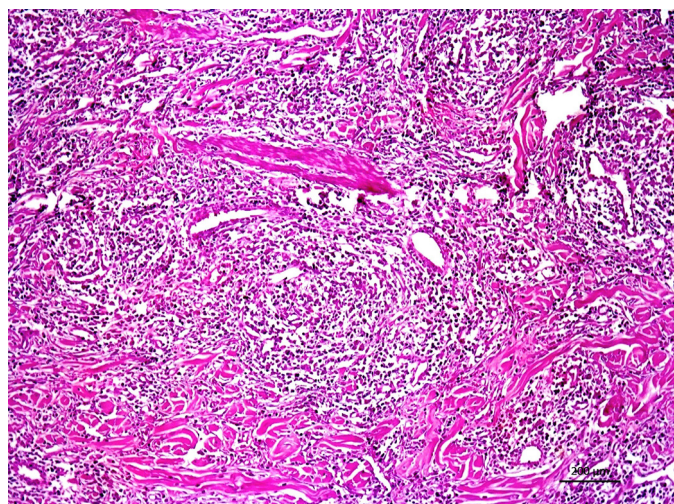


Fig.2. Oral extramedullary plasmacytoma in a collared peccary. Round neoplastic cells are distributed at submucosa layer. They are arranged in cords and nests, sustained by a delicate dense connective tissue. HE stain, obj.10x.

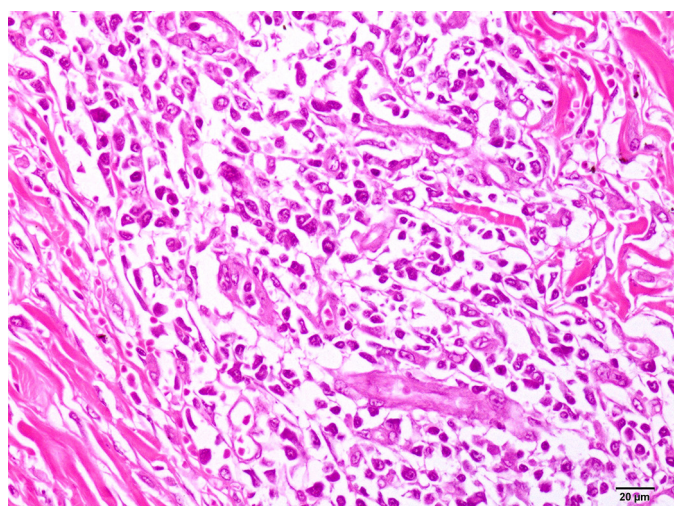


Fig.3. Oral extramedullary plasmacytoma in a collared peccary. Note the moderate well-differentiation plasma cells clusters separated by a fibrovascular stroma. HE stain, obj.40x.

evaluation of the inguinal, parotid, scapular, mesenteric and axillary lymph nodes revealed moderate to marked effacement of the normal follicular architecture, characterized by a large number of plasma cells located within the medullary sinuses and less commonly in germinal centers of the follicles. No cell infiltrate was identified within subcapsular sinuses.

During the IHC evaluation of oral mucosa and lymph node, a moderate multifocal labeling for Mb-1, mainly in the plasma cell, was observed. Tumor cells showed intermittent weak positivity for Bcl-2, and were uniformly negative for CD79a, CD20, CD4 and CD3. Based on the location, histopathological and immunohistochemical findings, an extramedullary plasmacytoma was diagnosed.

DISCUSSION

Plasmacytoma constitutes a group of tumors of neoplastic plasma cells. Generally, these tumors are divided in three mainly types: multiple myeloma (MM), solitary bone plasmacytoma (SBP) and extramedullary plasmacytoma (EMP) (Fry & MacGavin 2007, Valli 2007). Extramedullary plasmacytoma is a neoplasm caused by uncontrolled proliferation of plasma cells in a site outside the bone marrow. When the extramedullary plasmacytoma comes from the skin, without compromising the bone marrow, it can be named primary cutaneous plasmacytoma. Considered a rare kind of tumor, the primary cutaneous plasmacytoma is responsible for 3-12% of EMP. The prognosis is variable, and metastases are not a rule, they can or not occur (Bellinchon et al. 1996). The neoplasm reported here is considered less common in the group of plasm cells neoplasms. We classified the collared peccary tumor as an extramedullary mucocutaneous plasmacytoma, since the severe cutaneous lesions were distributed evenly on the entire animal body and on some mucosa areas.

Plasmacytomas are composed by plasm cells in different stages of differentiation, histologically indistinguishable from other tumors of round cells, such as: lymphosarcoma, histiocytoma, melanoma e mast cell tumor (Raskin 2003). Immunohistochemical techniques employing panels of antibodies against different cellular components have been shown to be valuable adjuncts to routine light microscopy and permit to establish definitive diagnoses for most tumors (Baer et al. 1989). Immunohistochemical reactivity to a variety of antibodies was evaluated in order to substantiate the plasma cell origin of the tumors of this study. Mb-1 (CD79a) is an antibody with high specificity and provides accurate and reliable method for distinguishing plasmacytomas from other round cell tumors in dogs (Schrenzel et al. 1998). In humans, Mb-1 is positive in approximately 50% of plasmacytomas (Chan 2000). In contrast, CD20 is negative in EMP, and excludes the diagnosis of other B-cell tumors (Schrenzel et al. 1998, Chan 2000).

Other important differentiation is related to the multiple myeloma, since this tumor is histologically indistinguishable from plasmacytomas (Kremer et al. 2005). The unique manner to distinguish them is recognizing other abnormalities, like the plasmocytosis of the bone and from osteolytic origin. Here, the examination of the bone marrow did not

reveal tumor cells, and osteolytic abnormalities (generally suggestive of a cutaneous plasmacytoma secondary to the dissemination of multiple myeloma) were not observed.

Mucocutaneous involvement in association with systemic amyloidosis, characterized by amyloid depots in different organs, has been accepted in some cases of plasmacytoma (Ramos-Vara et al. 1998). Tissue sections stained with the Congo red method failed in demonstrating amyloid, a feature that has been described in 15% of human extramedullary plasmacytomas, and cases of canine extramedullary plasmacytomas (Platz et al. 1997, Cangul et al. 2002).

Here, normocytic anemia can be a result of a chronic pathological state, which has its origin on dermatological inflammatory lesions. Often, normocytic anemia occurs in chronic inflammatory nonregenerative diseases, where the cytokine action on bone marrow can cause selective erythroid hypoplasia (also called chronic inflammatory anemia). Here, the total protein and globulin values were higher than the normal values for collared peccaries (normal values: 7.20g/dl for total protein and 4.5g/dl for globulin) (Lochmiller & Grant 1984). The hyperglobulinemia suggested an increase of antibody levels, similarly to the classical findings described by other authors in plasmacytoma cases. Probably, proliferation of plasm cell clones is responsible for the increase of immunoglobulin production (Rowland & Linke 1994, Platz et al. 1997).

To our knowledge, the occurrence of metastasis to the lymph nodes in extramedullary plasmacytomas evolving to the death is a rare phenomenon. The literature often reports a benign behavior of this neoplasm with good prognosis, and metastasis and relapses were just related for few times (Clark et al. 2003).

CONCLUSION

Based on lesions distribution, histopathological findings and immunohistochemical markers we can conclude that collared peccary (*Pecari tajacu*) was diagnosed with extramedullary plasmacytoma, a rare neoplasm never described in this species before.

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