XXXI CONGRESSO NAZIONALE
DELLA SOCIETÀ ITALIANA DI PARASSITOLOGIA
16-19 Giugno 2021

Concurrent cutaneous mast cell tumor and *Leishmania* sp. infection in a dog

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INTRODUCTION. Cutaneous mast cell tumor (cMCT) is the most common canine skin neoplasm. In particular, Shar-Pei dogs are highly predisposed to the development of poorly differentiated and very aggressive cMCT (White CR et al., 2011). We describe herein the main pathological features of cMCT with concurrent Leishmania sp. infection, which has been recently observed in a dog.

MATERIALS AND METHODS. An 8-year-old, spayed Shar-Pei developed a large skin lesion in the axilla region. Considering cytological findings, a poorly differentiated cMCT was diagnosed. Thereafter, the neoplasm was surgically excised and routinely processed for microscopic investigations. In addition, immunohistochemistry for mast cell (CD117) and histiocytic (MAC387) markers was carried out on seriate tissue sections.

RESULTS AND CONCLUSIONS. Histopathology allowed to classify this neoplasm as a high and 3rd grade cMCT **(Figure 1)**, according to Kiupel and Patnaik grading systems, respectively (Blackwood et al., 2012). Notably, a huge number of *Leishmania* amastigotes were seen, almost exclusively in the cytoplasm of CD117/pos-MAC387/neg neoplastic cells **(Figures 2 and 3)**. *Leishmania* infection was then confirmed by serological methods. The presence of *Leishmania* amastigotes has been rarely reported in non-histiocytic tumors and never documented in cMCT (Foglia Manzillo et al., 2008; Ferro et al., 2013). Actually, *in vitro* and *in vivo* studies indicate that mast cells play a role in the immune response to *Leishmania* sp. (Naqvi et al., 2017), being also able to uptake such protozoa. Therefore, we consider that the present case could raise a number of intriguing issues, which should be particularly addressed in areas of endemic leishmaniosis. On one side, our findings suggest that neoplastic mast cells might be suitable for infection, further widening the tissue tropism of *Leishmania* sp. From the host point of view, *Leishmania* infection might contribute to the onset and/or affect the prognosis of cMCT. Finally, the effect of antineoplastic therapy on leishmaniosis and vice versa, should be also carefully considered. Overall, the present case highlights the need to investigate and better understand whether and how *Leishmania* infection and cMCT could affect each other.

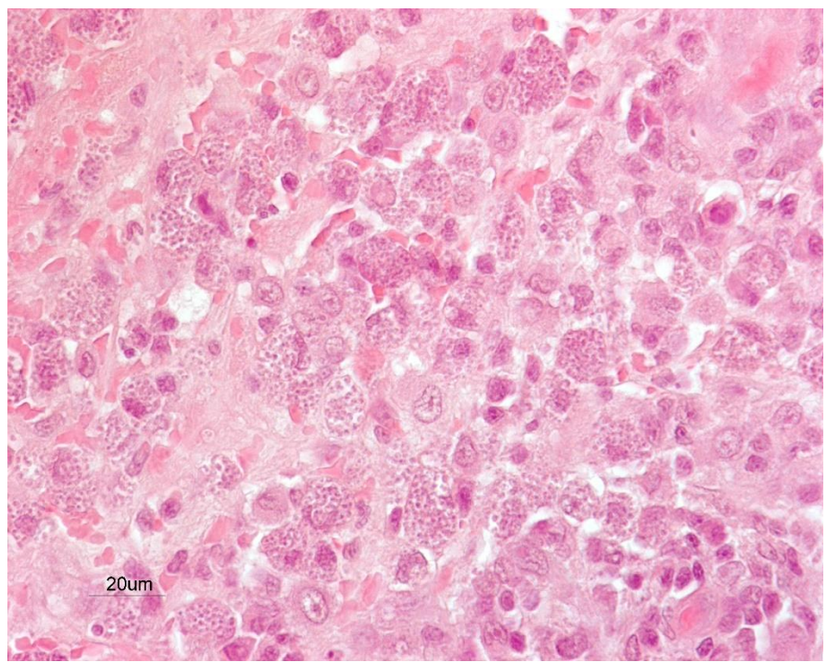

Figure 1.

Canine cutaneous mast cell tumor.

A huge number of neoplastic cells filled with *Leishmania* amastigotes are seen. Hematoxylin and eosin stain. Final magnification x400.

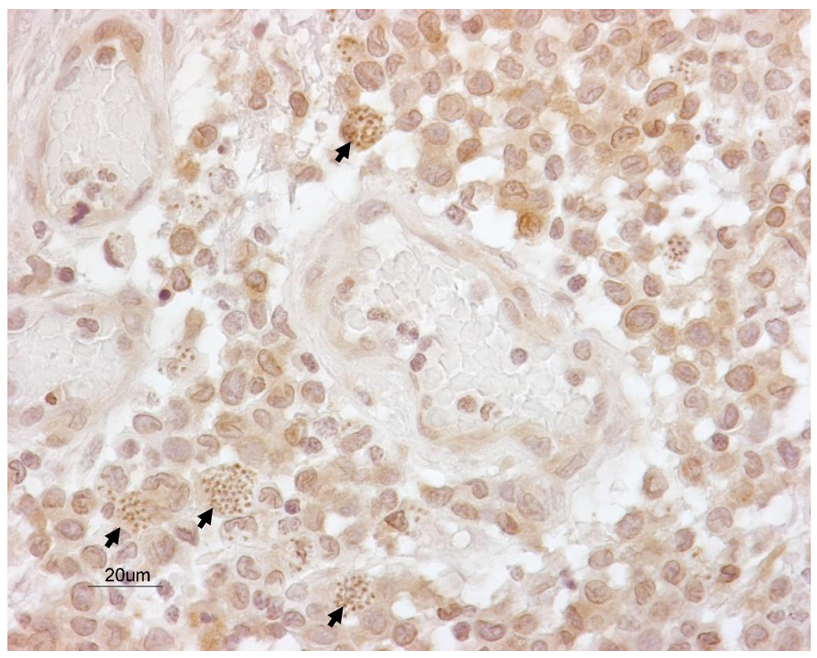

Figure 2.

Canine cutaneous mast cell tumor.

Immunohistochemistry for CD117.

Most of neoplastic cells are CD117-immunoreactive and often harbor *Leishmania* amastigotes (see black arrowheads). Mayer's hematoxylin counterstain. Final magnification x400.

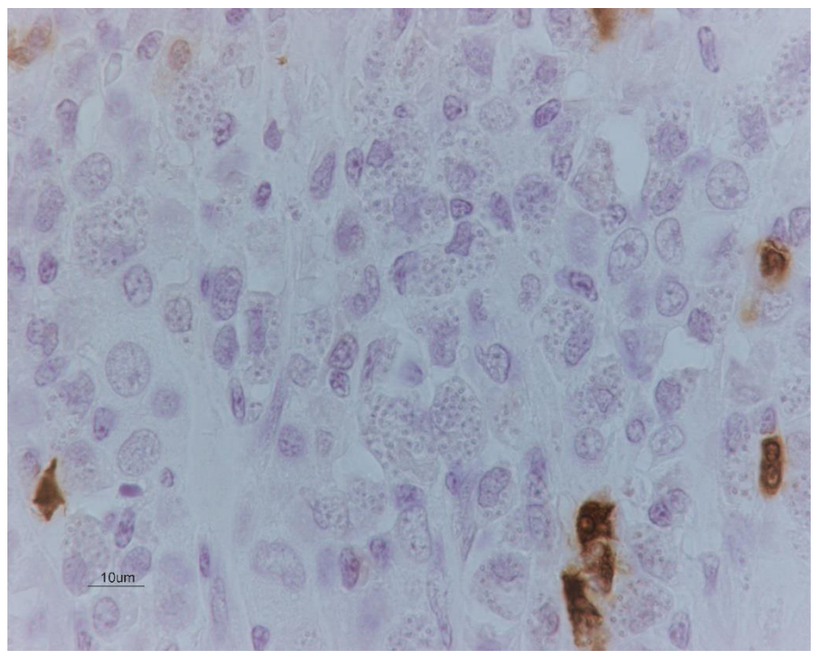

Figure 3.

Canine cutaneous mast cell tumor.

Immunohistochemistry for MAC387.

MAC387-immunoreactive histiocytes are clearly observed within the neoplasia. However, *Leishmania* amastigotes are mainly detected inside neoplastic MAC387-negative cells. Mayer's hematoxylin counterstain. Final magnification x600.

REFERENCE:
White CR et al., 2011 J Am Anim Hosp Assoc. 47:210–216; Blackwood et al., 2012 VCO 10(3): e1-e29; Foglia Manzillo et al., 2008 Vet Clin Pathol. 37:298–301; Ferro et al., 2013 Vet Pathol. 50:749-752; Ferro et al., 2013 Vet Pathol. 50:749-752; Naqvi et al., 2017 Nature 7: 13240