

Rare and uncommon malignant mammary tumours in dogs and cats: preliminary results from a portuguese multicentric study

A. Gama^{*,†}, F. Seixas^{*,†}, M.A. Pires^{*,†}, A. Alves^{*,†}, C. Marrinhas^{‡,§}, H. Vilhena^{§,†}, A. Santos^{¶,±}, F. Ferreira^{¥,Δ}, J. Santos[#], P. Dias Pereira[±], P. Faisca^{#,&} and J. Correia^{¥,Δ}

*Department of Veterinary Sciences, School of Agrarian and Veterinary Sciences (ECAV), University of Trás-os-Montes e Alto Douro (UTAD); †Animal and Veterinary Research Centre (CECAV), UTAD and Associate Laboratory for Animal and Veterinary Science (AL4Animals), Vila Real, PT; ‡Onevetgroup - Hospital Veterinário do Baixo Vouga, Aveiro, PT; §Centro de Investigação Vasco da Gama (CIVG), Escola Universitária Vasco da Gama (EUVG); ¶Onevetgroup Hospital Veterinário Universitário de Coimbra (HVUC), Coimbra, PT; ¶Centro de Estudos em Ciência Animal (CECA), and AL4Animals; #Instituto de Ciências Biomédicas de Abel Salazar da Universidade do Porto (ICBAS-UP), Porto, PT; ¥Center of Interdisciplinary Research in Animal Health (CIISA), University of Lisbon and AL4Animals; ΔFaculdade de Medicina Veterinária da Universidade de Lisboa, FMV-Ulissboa, #DNAtech Veterinary Laboratory; &Faculty of Veterinary Medicine and CBIOS – University Lusófona's Research Center for Biosciences & Health Technologies, University Lusófona, Lisboa, PT



Canine and feline mammary tumours (MT) are frequently diagnosed neoplasms. Histological proposed classifications recognize distinct entities, with several histotypes considered as uncommon or rare, such as MT of special type. The main objective of this study was to gather a large series of rare or uncommon canine and feline malignant MT (RUMT) from four different Portuguese institutions to better characterize these MT.

Material and Methods

Canine and feline MT submitted for histopathology from 2018 to 2022 were retrospectively selected from the laboratory databases; when diagnoses were compatible with a RUMT (special histotypes, micropapillary carcinoma, anaplastic carcinoma, carcinosarcoma), cases were reviewed and histologically graded, using a grading system for canine/feline mammary carcinomas.

From a total of 6420 MT (4642 canine and 1778 feline, excluding hyperplasias and dysplasias), 259 RUMT (256 animals) were found, with a higher prevalence in dogs; 205 (4.42%) represented canine and 54 (3.04%) feline RUMT.

Results and Discussion

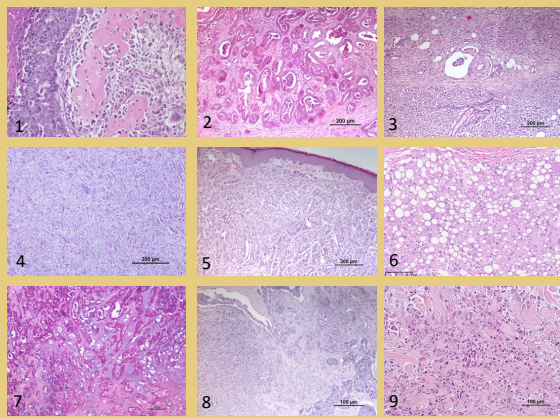
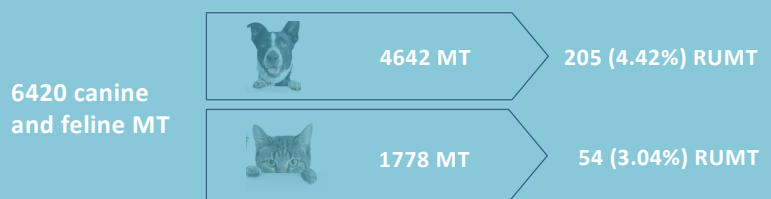


Fig. 1. Dog. Carcinosarcoma; Fig. 2. Dog. Adenosquamous carcinoma; Fig. 3. Dog. Anaplastic carcinoma; Fig. 4. Dog. Malignant myoepithelioma; Fig. 5. Dog. Inflammatory mammary carcinoma (IMC); Fig. 6. Dog. Lipid-rich carcinoma; Fig. 7. Cat. Mucinous carcinoma; Fig. 8. Cat. Carcinosarcoma; Fig. 8. Cat. Anaplastic carcinoma; Fig. 9. Cat. IMC. HE staining.



In dogs, rare and unusual tumours included carcinosarcoma (n=65; 1.4%); adenosquamous carcinoma (n=34; 0.73%), anaplastic carcinoma (n=32; 0.69%), malignant myoepithelioma (n=27; 0.58%), inflammatory mammary carcinomas (n=24; 0.52%), mucinous carcinoma (n=15; 0.32%), micropapillary carcinoma (n=5; 0.11%), lipid-rich (n=2; 0.04%) and spindle cell carcinoma (n=1; 0.02%). In cats, RUMT included adenosquamous (n=12; 0.68%), mucinous (n=11; 0.62%), carcinosarcoma (n=10; 0.56%), anaplastic carcinoma (n=9; 0.51%), micropapillary carcinoma (n=6; 0.33%) and inflammatory mammary carcinoma (n=6; 0.38%). Adenosquamous carcinoma was the most common special histotype in both species. Most carcinomas were grade III (63.9%).

This joint effort of Portuguese academic and private institutions allows a large-scale comprehensive investigation of epidemiological, morphological and immunohistochemical RUMT specific data.

Future studies:

- to increase the cohort of RUMT
- to study RUMT clinical behaviour
- to perform RUMT immunohistochemical characterization



References:

Zappulli V, Pena L, Rasotto R, Goldschmidt M.H., Gama A., Scruggs J.L., Kuipel M. Volume 2: Mammary Tumors. In: Kuipel M., editor. *Surgical Pathology of Tumors of Domestic Animals*. Davis-Thompson DVM Foundation; Washington, DC, USA: 2019. pp. 1–195.
 Rasotto R, Berlato D, Goldschmidt M.H., Zappulli V. (2017). Prognostic Significance of Canine Mammary Tumor Histologic Subtypes: An Observational Cohort Study of 229 Cases. *Veterinary Pathology* 54:571-578



This work was financed by national funds through FCT – Portuguese Foundation for Science and Technology, within the scope of the projects UIDB/CVT/00772/2020 (CECAV), UIDB/00276/2020 (CIISA), LA/P/0059/2020 and AL4A-PROJ-LT3.2 (AL4Animals).