Commentary

Nuclear Medicine Review 2005
Vol. 8, No. 1, pp. 50–52
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ISSN 1506–9680

VIA MEDICA

# Veterinary nuclear medicine again – commentary and remarks on: Krzemiński M et al. Veterinary nuclear medicine – a review. NMR 2004; 7: 177–182

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[Received 8 IV 2005; Accepted 17 V 2005]

It was a heart-warming experience to read the review article by Krzemiński et al in the latest issue of the present journal [1]. Many thanks to the authors and the editorial board for publishing and hosting veterinary nuclear medicine as a topic — which I truly hope — was interesting and useful not only for us, veterinarians, but also for nuclear medicine researchers and maybe even for human clinicians. Yes, ours is a border-line topic, providing information not only for the referral veterinary clinicians on their four-legged patients but also for the nuclear medicine industry, biomedical research and the clinics.

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The review article was informative and touched all aspects of veterinary applications. Only minor personal commentaries and remarks will be added to it in this present writing.

Veterinary nuclear medicine is somehow similar to its roots, Human Nuclear Medicine, but certainly there are a few basic differences. Patients sent by veterinary clinicians could be members of exotic species (birds, reptiles, rodents) and even the most often treated dog, cat, and horse patients vary in a pretty wide scale in weight, size and anatomical, physiological features. As there are no veterinary radiopharmaceuticals in the market, vets use human registered products, therefore applied radioactive doses are often calculated on an empirical manner. As opposed to humans, animal subjects almost always need to be sedated or anaesthetized for scintigraphical protocols. We vets, frequently perform bone and thyroid scintigraphy in the everyday clinical routine and oncological applications are more and more common in the veterinary field as well. But in contrast with human practice, our animal patients suffer very rarely from cardiovascular diseases, so heart and brain perfusion studies are less frequently performed at veterinary clinics.

The main and most important issues were included in the previous review article, so I only pinpoint a few special tasks selected from Veterinary nuclear medicine. Veterinary scintigraphists are frequently asked to assist reproduction in the horse practice, where useful information can be provided using $^{99m}$Tc labelled colloids [2, 3]. Similarly, inseminating the females with $^{99m}$Tc HM-PAO labelled sperm cells is a way to find out which part of the genital tract is penetrable for them [4]. How else than with performing brain SPECT receptor scintigraphy could we get information non-invasively on the aggressive and impulsive behaviour of German shephards [5, 6]? Veterinary scintigraphists take $^{99m}$Tc MIBI when

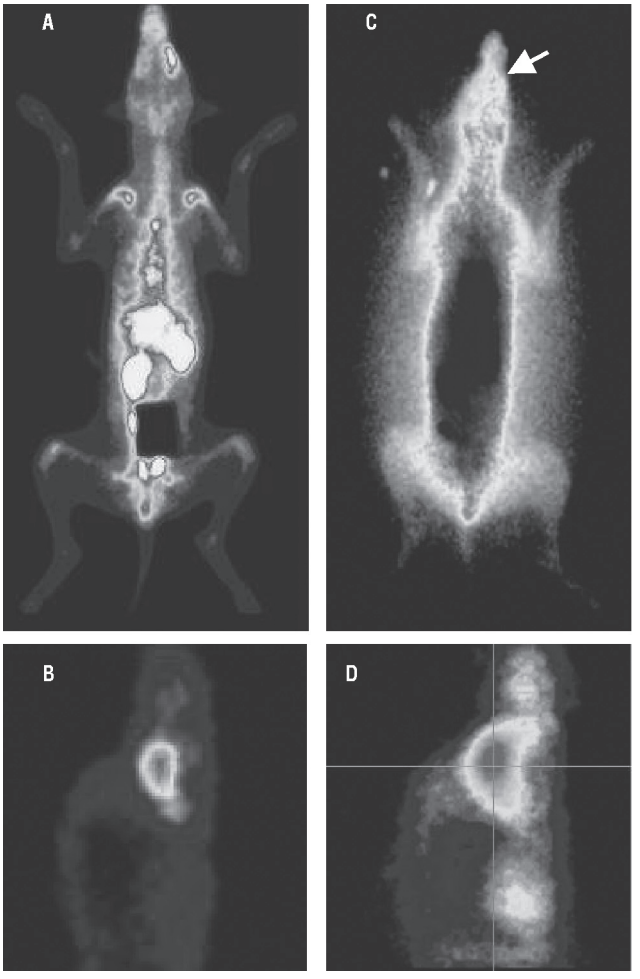


**Figure 1.** (A-D) Uptake of $^{99m}$Tc and $^{188}$Re DMSA(V) in a dog with fibrosarcoma. **A.** $^{99m}$Tc-DMSA (V) AP whole-body image; **B.** $^{99m}$Tc-DMSA (V) saggital SPECT plane of head; **C.** $^{188}$Re-DMSA (V) AP whole-body image, arrow points at asymmetrical uptake of head; **D.** $^{188}$Re-DMSA (V) saggital SPECT plane of head. A 13-year-old mixed breed dog (weight 21 kg) was referred to NRIRR with a histologically confirmed fibrosarcoma in the right maxilla. A SPECT study of the region and a whole-body scintigraphy was performed with 400 MBq of $^{99m}$Tc-DMSA(V). Then, as tumor uptake has been found to be adequate, the owner's informed consent and the animal welfare authorities' permission was obtained to perform a study with 1.5 GBq $^{188}$Re-DMSA (V) in the same dog. Again, SPECTs of the head (128 frames, 30 seconds for each frame) and whole body scintigrams were obtained.

they are planning to support the stadium based diagnosis or follow-up of malignant lymphoma, parathyroid malignancies and mammary carcinomas in dogs and this is the radiopharmaceutical of choice when *in vivo* multidrug resistance (presence of PgP--pump) examination is goaled [7, 8]. Pentavalent $^{99m}$Tc DMSA proved to be sensitive in the localization and follow-up of a variety of canine bone (osteosarcomas, fibrosarcomas) and soft tissue tumors (sarcomas, mammary carcinomas, mastocytomas, ...) in over hundred dog patients [7].

The list of applications is not complete, it is only intended to give an insight into veterinary nuclear medicine. One picture worth thousands of words in the veterinary field as well — so Figure 1 is illustrating how oncological scintigraphy and radioisotope therapy works in dog patients.

The study was conducted with the aims of clarifying overall health safetiness and tumor localization of this therapeutic radiopharmaceutical and to provide internal dosimetric measurements by using of MIRDOSE 3.0.

Taken together these aspects indicate the yet underutilized synergies that pet cancers offer providing a very valuable animal model for human oncotherapic modalities whilst giving the possible benefits of a new therapy to a diseased animal.

Future perspectives of veterinary nuclear medicine are similar to those of its human counterpart. Once, in vets we will also use SPECT/CT and PET/MRI instruments for our animal patients — I hope even I will do so in my life [9–11]. Furthermore, therapeutical application of radiopharmaceuticals will help a lot more animal patients in the future than it does today. I strongly believe that these great common goals could be achieved more easily in a close co-operation with human nuclear medicine colleagues. We veterinarians have learned a lot from the nuclear medicine community, but I am quite sure we also can provide useful data on radiopharmaceutical research and development, instrumental development, education, and radiation safety (patient-, staff-, environment dosimetry, waste handling ...). Is there any sensitivity and willingness to receive them?

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