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P72 - Elbow dysplasia: an unsolved problem

Friday, 11 July 2014 13:00 (1 hour)

Elbow dysplasia happens most commonly in dogs between 4 and 6 months in medium and large dogs, during the period of high growth velocity. In Portugal the disease appears frequently and affects mainly the large dogs. The term Elbow dysplasia includes different entities including fragmented medial coronoid process, osteochondrosis dissecans and incongruity of the elbow joint. All of the above can cause lameness and osteoarthritis. Fragmented medial coronoid process is now called medial coronoid process (MCP) disease since tomographic and histopathological studies showed that bone disease might be present without fragmentation of the process, this finding implies that simple fragment removal, via arthrotomy or arthroscopy, may be an incomplete treatment [1]. This disease may be caused by different factors, being genetics associated with environment influences the most important. In order to achieve a better phisiophatological knowledge to assert a more efficient and less expensive therapy, elemental and structural studies at the bone–cartilage interface in normal and diseased elbow joint affected by MCP were performed.
Micro-Proton Induced X-ray Emission (u-PIXE), Elastic Backscattering Spectrometry (RBS), micro-Proton Induced Gamma-ray Emission (u-PIGE) and Scanning Electron Microscopy (SEM) were applied for qualitative and quantitative analysis of the bone-cartilage interface removed after arthroscopy.
For micro-PIXE, RBS analysis and micro-PIGE analysis, the experiment was performed at the Van de Graaff accelerator facility of CTN/IST in Lisbon. An Oxford Microbeams-type nuclear microprobe was used (OM150 triplet system) [3], which allowed the proton beam to be focused on the sample with a spatial resolution of 3x4 μm2.
SEM observations have been carried out with backscattered electrons (BSE) using a JEOL JSM 7001F microscope equipped with an INCA Oxford Instruments EDS spectrometer for point analyses and X-ray mapping.
The combination of these techniques proved to be a viable approach for the bone-cartilage interface characterisation and the results were compared to the concentrations for healthy bone-cartilage interface. The role of major, minor and trace elements (Na, Ca, P, S, K and Zn) as well as cartilage organisation at the bone–cartilage interface, implicated in MCP disease were interpreted.
[1] Palmer R. H., 25th IEWG international annual meeting proceedings, Bologna.2010.
[2] Alves, L.C. et al, NIMB, 161:334-338, 2000.

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