

## **6. Summary**

### **Comparative Diagnosis of Canine Elbow Dysplasia between Radiography, Computer Tomography and Arthroscopy**

Fragmented medial coronoid process of the ulna (FMCP) and elbow incongruity (EI) are common in young dogs of certain breeds such as Labrador Retrievers, Golden Retrievers, Rottweiler and Bernese Mountain dogs. Affected dogs present with lameness of the forelimbs. Diagnosis of FMCP is frequently made by radiography. Many radiographic projections are recommended include cranio-caudal, mediolateral, flexed mediolateral, cranio-caudal medial, lateral oblique projection in many angles etc. However, the radiographic findings are unreliable because of the complexity of the joint. Early and accurate diagnosis is important to prevent the development and progression of osteoarthritis.

The first part of the study to compare three methods for diagnosis of FMCP: radiography, computer tomography and arthroscopy. Arthroscopy serves as the gold standard in this study. The most observable lesions (78 of the 92 elbow joints) from radiography were osteophyte formations at subtrochlear regions of the ulna. From CT, results 60 of the 92 elbow joints had periarticular new bone formations. Radiography had an accuracy of 86%, specificity of 88% and sensitivity of 57%, whereas CT had 87%, 100% and 86%, respectively. Additionally, CT could clearly demonstrate separated fragments of the medial coronoid process. Arthroscopy and CT findings did not significant differ; however, synovialitis, cartilage erosion and joint incongruence tended to be better evaluated by arthroscopy as compared to CT. Radiography was least expensive and practical technique but it is unreliable for the diagnosis of the FMCP. CT and arthroscopy were significantly more accurate but both of them needed sophisticated instruments and experienced technicians.

The second part of the study was to evaluate elbow joint space for diagnosis of EI by CT. EI had been assumed to cause FMCP. CT could be a good diagnostic tool, because it could exactly detect humero-radial and humero-ulnar joint space in thin-slice projection. Sample size of 79 FMCP and 57 control elbows were studied. On sagittal reconstruction, FMCP elbows exhibited a significant increase of humero-radial (1.00 mm.) and humero-ulnar (1.00-1.08 mm.) joint space as compared with control (0.83-0.87 mm.). No difference of humero-radial and humero-ulnar was noted on coronal reconstruction. Moreover, we could confirm that subtle joint incongruence (0.2-0.8 mm.) could be better detected by CT than by radiography. These results indicated that sagittal reconstruction using CT was beneficial to determine joint space measurements as a detection method for EI. In addition, result from this study might be applied to test the hypothesis that joint incongruity is associated with FMCP in dogs.