

## Summary

At present 126 synovial fluid samples were submitted for analysis at the Institute of Biodiagnostic, National Research Council of Canada. Demographic data of those 51 control samples were derived from 39 male and 12 female dogs with the mean age and body weight of  $4.9 \pm 1.7$  years and  $19.8 \pm 3.1$  kg (mean $\pm$ SE) respectively. Breed represents of the control group are crossbreed, golden retrievers and poodle. The samples of cranial cruciate ligament rupture group (CCRL) collected prior the surgical correction procedures are from 41 male and 34 female canine patients with the mean age and body weight of  $5.9 \pm 1.7$  years and  $20.9 \pm 3.5$  kg (mean $\pm$ SE). Breed represents of CCLR group includes Crossbreed, Golden Retrievers, Poodles, Thai Bangkaew, Rottweiler, American Pit Bull terriers, Bull terriers, Lhasa Apso, Shih Tzu, Yorkshire terriers and Miniature Pinscher.

The mean score of orthopedics grading system of the CCRL group including locomotor ability, weight bearing, joint mobility and pain scores are  $2.7 \pm 0.7$ ,  $2.7 \pm 0.8$ ,  $3.2 \pm 0.8$ ,  $2.9 \pm 0.6$  (mean $\pm$ SE), respectively. The radiographic evaluations had been carried out (figure 2). Thirty-three canine patients demonstrated radiographic sign of joint effusion without any significant change of the bony component. The radiographic score of 42 canine patients in the CCRL group revealed the changes according to the features of the radiographic grading system (ranging from 0-39) with radiographic score of  $10.7 \pm 1.9$  (mean $\pm$ SE). All of the cruciate ligaments were completely torn with varying degree of medial meniscal injury (figure 3). Among those CCLR group, 49 of 75 patients (65.3%) are patients with normal gross appearance of medial and lateral menisci. The partially torn and severely torn menisci are detected intraoperatively at the proportion of 5.3%, and 29.3% respectively.

The infrared spectra of synovial fluid samples from canine patients reveal the peaks that represent functional group of biological components within the sample. The synovial fluid spectrum composes of the N-H stretching vibration of the protein,  $\text{CH}_2$  and  $\text{CH}_3$  stretching vibration, C-O stretching vibration of the protein, N-H bending vibration of the protein and C-O stretching vibration of hyaluronic acid. The pattern recognition process of the samples from both CCLR and control group are still conducted at the Institute of Biodiagnostics, NRC, Canada by using the genetic algorithm software. Once the pattern recognition step yields the satisfactory result the specificity and sensitivity of the technique will be reported to determine the feasibility of using infrared spectroscopic method as a diagnostic tool for diagnosis of osteoarthritis in canine population.