

Evaluation of a Model for Experimentally-Induced Osteoarthritis in the Hip Joint of the Dog

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(Abstract)

Twelve normal mixed-breed dogs were selected and assigned to acetabular rotation or sham-operated groups. Rotation group dogs had pelvic osteotomies followed by application of an ilial bone plate, causing rotation of the acetabulum to reduce dorsal coverage of the femoral head. Sham group dogs received identical osteotomies but were plated in normal orientation.

All dogs had force plate and subjective lameness evaluations pre-operatively and post-operatively. Pelvic radiographs were evaluated pre-operatively and at four-week intervals post-operatively. The dogs were killed at the conclusion of the study, and samples were taken for evaluation.

Analysis of vertical ground reaction forces indicated a significant difference between treatment groups, however no difference was noted based on subjective scores. No difference was observed between groups based on radiographic estimations of degenerative changes or Norberg angle, however the coverage of the femoral head was less in rotated dogs. Mild inflammatory changes were discernible in the joint capsule of some dogs in both groups. A trend toward more severe change was present in the left hip of the treatment group, but statistically significant difference was noted only when comparing the right and left legs of the acetabular rotation group.

Although evidence of osteoarthritis was noted histologically, only minor differences were detected in the dogs by other means. Because of the minimal changes noted over the duration of the study, we conclude that the model does result in histopathologic change consistent with osteoarthritis, but that force plate analysis, radiographic evaluation, and clinical lameness evaluation are insensitive measures of this change.

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