Elbow arthrodesis in the dog

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Treatment alternatives for dogs with moderate to severe elbow osteoarthritis (OA) include nonsurgical management, debridement arthroplasty (removing loose bodies and osteophytes from the joint), arthrodesis and total elbow replacement. In a clinical report, one dog with severe elbow OA had surgery to remove fragmented medial coronoid processes and a fractured anconeal process; this dog returned to near normal function after surgery. This case may be the exception rather than the rule, however, because the dog became acutely lame because of an intra-articular fracture. There are no reports in the peer-reviewed literature addressing debridement arthroplasty for moderate to severe OA in the dog. However, in one abstract it was suggested that this procedure provided good long-term results. Total elbow replacement has been performed clinically for nearly a decade and certainly has its merits but some of these cases will have unsatisfactory outcomes and require arthrodesis. Elbow arthrodesis can be performed as a primary procedure for end stage elbow OA or may be indicated because of a poor outcome following repair of a humeral condylar fracture, elbow luxation, congenital deformity or elbow replacement. Unfortunately, very little information can be derived from the peer reviewed literature. deHann et al. retrospectively investigated results after primary arthrodesis of the elbow in twelve dogs and found that although pain in the joint was eliminated, function of the limb was limited. Empirically, I would agree with these findings following primary arthrodesis of the elbow and add that recovery is very slow and patients seem to benefit from aquatic rehabilitation.

The surgical technique that I use involves a caudolateral approach to the elbow. I take the tendinous attachments of the triceps off the olecranon as closely as possible and then cut the olecranon off in a curvilinear fashion such that a bone plate can be applied caudally. This bone is then ground with a rongeur into small pieces. Following luxation of the elbow and removal of all cartilage the bone graft is applied. In dogs that weigh greater than 35-kg I generally will apply a 4.5-mm lengthening plate; dogs that weigh less than this will receive a 3.5-mm lengthening plate.

Unfortunately, I have had the opportunity to perform several elbow arthrodesis surgeries following elbow replacement. This is not a particularly pleasant surgery but, in my opinion, dogs perform better after this surgery than if they had a primary elbow arthrodesis. I have no good explanation for this other than they are dogs that have, in general, suffered for years from elbow pain and now are effectively pain free. The surgical technique varies in that the implants and cement need to be removed. At times this is difficult and tedious and I have had to fracture off the medial aspect of the condyle to improve access to the humeral canal. Following a through flush bone graft is applied. Graft is harvested from the olecranon, the wing of the ileum and I also add 1-3 cc of cancellous allograft. Use of bone morphogenetic protein-2 is indicated if available. Application of the plate is identical.