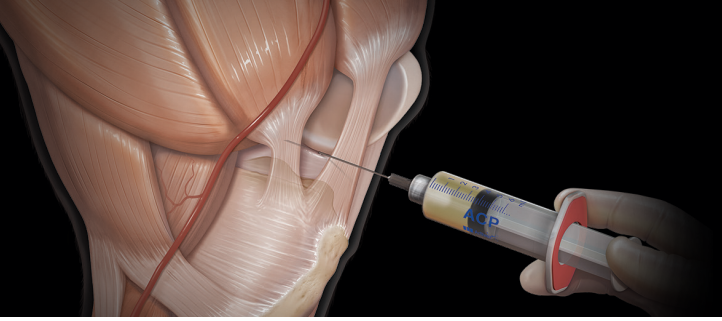

ACP® Double-Syringe for Veterinary Joint Injections Scientific Update

Joint pathology causes pain with daily movement and can inhibit function. When intra-articular soft tissues, like the synovium, meniscus, and ligaments, become chronically inflamed due to injury, they can shift the joint environment , causing degradation and pain and eventually becoming osteoarthritis (OA). This chronic state causes soft tissue to become irritated and the joint painful, which leads to loss of normal function through movement. Platelet-rich plasma (PRP) is an autologous growth factor treatment that reduces inflammation, clears away cell debris and damaged tissue, and aids in tissue regeneration. Arthrex's Autologous Conditioned Plasma (ACP) is a closed plasma-based system for preparing leukocyte-reduced PRP in a single 5-minute spin.

ACP Treatment of Cranial Cruciate Ligament Tears

Cook JL, Smith PA, Bozynski CC, et al

Multiple injections of leukoreduced platelet rich plasma reduce pain and functional impairment in a canine model of ACL and meniscal deficiency. *J Orthop Res.* 2016;34(4): 607-615. doi:10.1002/jor.23054

- The objective of the study was to determine the effects of multiple intra-articular injections of a leukoreduced PRP on ACL healing, meniscal healing, and amelioration of OA in a canine model
- A total of 12 canine underwent partial canine cruciate ligament (CCL) transection and meniscal rrelease. Half received an ACP injection with an average increase in platelets of 2.5-fold over whole blood, and half received saline injections at 1, 2, 3, 6, and 8 weeks following transection
- Animals were tested for range of motion, lameness, pain and effusion, gait kinetics, radiographic scoring, and arthroscopic assessments up to 6 months following transection
- Saline-treated dogs had significantly more motion loss, more pain, more severe lameness, lower function, and lower total pressure in affected hindlimbs compared to ACP-treated dogs
- Saline-treated knees showed moderate to severe synovitis, further ACL disruption, and medial compartment cartilage loss, while ACP treated knees showed evidence of ACL repair and less severe synovitis
- ACL material properties in ACP-treated knees were closer to normal than in saline-treated knees; however, the differences were not statistically significant, but histopathology was significantly less severe in ACP-treated knees

Takeaway

Five intra-articular injections of leukoreduced PRP had beneficial effects for ACL healing, improved range of motion, decreased pain, and improved limb function for up to 6 months in this model.

Arthrex® Vet Systems

Bozynski CC, Stannard JP, Smith P, et al

Acute management of anterior cruciate ligament injuries using novel canine models. *J Knee Surg.* 2016;29(7):594-603. doi:10.1055/s-0035-1570115

- The purpose of this study was to investigate ACP compared to a washout procedure for effectiveness of acute management of CCL injuries with varying severity
- NSAIDs and rest, washout, and a single ACP injection were employed on a sham, an exposed CCL, and a partial CCL with a 7-week follow-up for clinical, diagnostic, arthroscopic, synovial fluid, and histological analysis
- ACP treatment following CCL injury was associated with decreased pain, lameness, effusion, pro-inflammatory proteins, and radiographic score while increasing range of motion
- There was no difference in histological and arthroscopic assessment, but subjectively the arthroscopic assessment found that the partial tear and exposed group with ACP treatment showed superior tissue integrity, tautness, vascularity, and fiber pattern

Takeaway

The acute treatment of CCL injuries appear to have superior results with a single ACP injection and long-term studies are needed to see if there is an impact on the histological and arthroscopic assessment as CCL injuries left untreated and it's likely progression to OA.

Gines JA

Effect of leukoreduced platelet rich plasma on intra-articular pro-inflammatory cytokines in a canine pilot study. *Animals (Basel).* 2022;12(17):2163. doi:10.3390/ani12172163

- The objective of this study is to evaluate the concentration of pro-inflammatory cytokines in dogs with stifle OA and how intra-articular administration of leukoreduced PRP affects that concentration
- 8 dogs (4 ACP-treated and 4 saline-treated) arrived in clinic with a CCL tear and elected for a surgical procedure during which their synovial fluid was analyzed and they received a joint injection at initial evaluation, surgery, and suture removal
- Blood and PRP samples were analyzed for platelet, white blood cells (WBC), neutrophil, and red blood cells (RBC) at initial evaluation and day of surgery while synovial fluid was tested for TNFα and IL-6 (inflammatory markers) at evaluation, surgery, and suture removal
- The PRP showed a 1.7- and 1.4-fold increase of platelets with a 99.7% reduction in WBC and an almost total reduction of neutrophils and RBC at each timepoint
- The ratio of TNFα and IL-6 to the evaluation time was only significantly increased at surgery time for TNFα in the control group, but the ratio was decreased for both markers at each time with the ACP treatment and likely did not reach significance due to the small sample size

Takeaway

The use of leukoreduced PRP reduces the ratios of this pro-inflammatory cytokine between leukoreduced PRP or saline intra-articular injections in dogs with natural occurring CCL rupture, and future studies with this study setup will be needed to correlate finding with functional use and recovery.

Arthrex® Vet Systems

ACP Treatment of Osteoarthritic Joints

Franklin SP, Cook JL

Prospective trial of autologous conditioned plasma versus hyaluronan plus corticosteroid for elbow osteoarthritis in dogs. *Can Vet J.* 2013;54(9):881-884.

- This prospective, randomized, double-blinded trial compared outcomes in dogs with bilateral elbow OA treated with hyaluronan and methylprednisolone or ACP
- 10 dogs (5 per group) with elbow OA were randomized to the 2 treatment groups with follow-ups at 1, 6, 12, and 24 weeks
- Both groups saw a significant improvement in lameness grade without a difference between groups

Takeaway

A single injection of ACP following the presentation of OA can decrease lameness like hyaluronic acid and corticosteroid without the potential long-term cytotoxicity to cartilage cells that the corticosteroids are known to cause.

arthrexvetsystems.com

Arthrex® Vet Systems