Achilles Tendinopathy in the Agility Dog

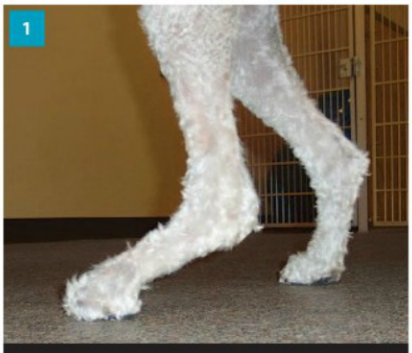
By Brittany Jean Carr, DVM and Sherman O. Canapp, DVM, MS, CCRT, DACVS, DACVSMR
Photos courtesy of VOSM

Achilles tendinopathy or Achilles tendon injury is commonly seen in the agility dog. The Achilles (common calcaneal) tendon is made up of three structures: the gastrocnemius, superficial digital flexor, and the common tendon of the biceps femoris, gracilis, and semitendinosus. In dogs the injury can be acute or chronic and involve either part of the tendon or the entire tendon. Most Achilles tendon injuries are reported to occur in medium- to large-breed dogs, either during normal activity or as a result of trauma. Overuse due to chronic repetitive activity is believed to be an important factor in Achilles tendinopathy in the agility dog. Activities such as quick turns, landing from jumps, and jump-turn combinations often place soft tissue structures under extreme stress and can result in a strain injury.

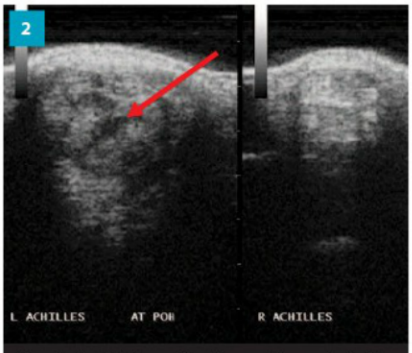
Strain injuries reduce the tensile strength of tendons, predisposing them to further injury. Repeated strain leads to disruption of the tendon fibers, causing pain and inflammation. Partial rupture, with one or more tendon components intact, has been most commonly reported in dogs. Regardless, rupture of one or more of the structures can be a debilitating injury in agility dogs.

Diagnosis

Often dogs with an Achilles tendon injury present with a non-weight bearing lameness that improves with a few weeks. However, a plantigrade stance, "dropped hock," or "clawing posture" stance gradually develops. See **Figure 1.** On orthopedic examination the Achilles tendon is often thickened and fails to engage properly. Radiographs can confirm soft tissue swelling and rule out concurrent fractures. At VOSM musculoskeletal diagnostic ultrasound is used to further evaluate the components of the tendon and identify the injured structures and help determine the best treatment plan. See **Figure 2.**



A patient with an Achilles tendon injury with a plantigrade stance, dropped hock, or clawing posture stance.

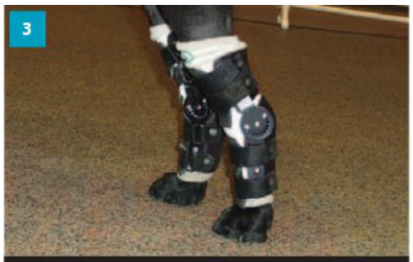


Musculoskeletal diagnostic ultrasound is used to further evaluate the components of the tendon and identify the injured structures to determine the best treatment plan.

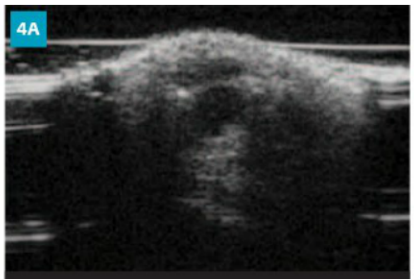
Treatment

Treatment for Achilles tendon injury is based on the degree of injury as indicated on musculoskeletal ultrasound. For mild (Grade I) strains, rest, non-steroidal anti-inflammatory medications, and rehabilitation therapy with low level laser therapy with or without a support wrap is indicated. More moderate (Grade II) injuries require the aforementioned therapies and regenerative medicine therapy (often platelet rich plasma with or without stem cell therapy). For full tears or avulsion (Grade III) injuries, surgical reconstruction is recommended.

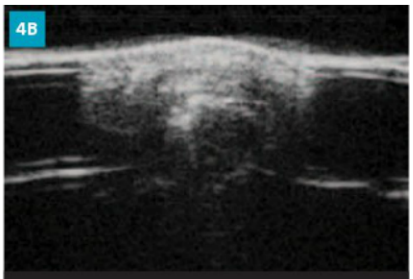
Multiple surgical repair techniques have been described. Surgery performed is often dependent upon the degree of injury and structures injured seen on diagnostic ultrasound and intraopertively. Following surgery, healing time is approximately 16 weeks. During this time, patients are placed in a splinted bandage for the first six weeks and then transitioned to a custom hinged brace that can be dynamized over the recovery period to gradually allow for more range of motion at the tarsus



A custom hinged brace that can be dynamized over the recovery period to gradually allow for more range of motion at the tarsus and engagement of the Achilles tendon mechanism.



An ultrasound guided injection of stem cell and PRP therapy in a patient with an Achilles tendon injury, showing the needle in place (arrow).



Post ultrasound guided injection of stem cell and PRP therapy.

and engagement of the Achilles tendon mechanism. See **Figure 3.** Rehabilitation therapy and augmentation with stem cell and platelet rich plasma (PRP) therapy is strongly encouraged to further support healing and regeneration of injured tissues.

Recently, regenerative medicine therapy has been used to help treat Achilles tendon injuries in both human and veterinary medicine. Regenerative medicine is used to augment surgical repair. Regenerative medicine therapy at VOSM often consists of PRP and stem cell therapy since recent studies suggest that PRP therapy and stem cell therapy have a synergistic effect when combined. Both PRP and stem cells have been shown to regenerate tissues, increase blood supply, and break down scar tissue, replacing it with regenerated tissue. VOSM has the capability to offer PRP, bone marrow-derived stem cell concentrate (BMAC), culture expanded bone marrow-derived stem cell (BMSC), adipose-derived stromal vascular fraction stem cells (SVF), and culture-expanded adipose-derived stem cells (ADSC).

Regenerative medicine therapy is a minimally invasive procedure that typically can be performed on an outpatient basis. Ultrasound guidance is used to ensure accuracy of the injection since both PRP and stem cells are most effective when administered directly into the site of injury. See **Figures 4a and 4b.** Sedation is often required. The most common side effect is mild discomfort associated with the injection, which typically resolves within 12 to 24 hours of the injection.

Rehabilitation therapy has been used to either treat mild Achilles tendon injuries or in conjunction with surgical repair and/or regenerative medicine therapy. Typically, a dedicated 16-week rehabilitation therapy program. Rehabilitation therapy helps to speed healing by decreasing inflammation and swelling, building muscle mass, increasing range of motion, and improving overall comfort. Therapy sessions often include manual therapy, standard isometric exercises, gentle passive range of motion (PROM), and class III-b laser therapy. Underwater treadmill therapy and therapeutic ultrasound can usually be incorporated into rehabilitation therapy. Rehabilitation therapy should be performed weekly in conjunction with an at-home exercise program. At-home exercises should include exercises that eccentrically load the Achilles tendon.

Return to Function

Once the tissue has healed, as confirmed via diagnostic ultrasound, the rehabilitation program focuses on strengthening and conditioning. Once a normal fiber pattern and appropriate muscle mass have been attained, dogs are then cleared for retraining and return to sport. On average, patients treated with surgery and/or regenerative medicine therapy typically return to competition within six months of treatment completion.

Summary

Achilles tendinopathy or Achilles tendon injury can be acute or chronic and involve either part of the tendon or the entire tendon. Surgical repair, regenerative medicine therapy, custom hinged braces, and/or rehabilitation therapy may be used to treat Achilles tendon injuries. Following treatment, patients are gradually returned to agility over six months and often return to competition.

References

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Dr. Sherman Canapp, owner and Chief of Staff at Veterinary Orthopedic & Sports Medicine Group (VOSM), specializes in orthopedics, sports medicine, minimally invasive surgery, and rehabilitative and regenerative medicine therapies. Dr. Canapp is recognized as a leading authority and lectures worldwide in his areas of specialty. His special interests include the study of conditions common to sporting dogs and the use and development of cutting-edge technologies for diagnosis and treatment of these conditions. He has been serving the agility community since 2007, offering advanced diagnostic and treatments, and in 2010 began an annual free gait analysis clinic for agility competitors. Visit www.vosm.com to learn more about Dr. Canapp and VOSM.

Dr. Brittany Jean Carr is currently a rehabilitation therapist and American College of Veterinary Sports Medicine and Rehabilitation resident at Veterinary Orthopedic and Sports Medicine Group (VOSM) in Annapolis Junction, Maryland. She earned her B.S. in biology from Furman University in Greenville, South Carolina. She then attended the Virginia-Maryland Regional College of Veterinary Medicine at Virginia Tech in Blacksburg, Virginia. During her time in veterinary school, she served as president of the student chapter of the American Veterinary Medical Association and was honored with the College of Veterinary Medicine Outstanding Senior Award. After earning her DVM, Dr. Carr completed a small animal rotating internship at the Animal Specialty Group in Los Angeles, California and surgical internship at VOSM. Dr. Carr's research studies include objective gait analysis, regenerative medicine, and return to sport following cranial cruciate ligament injuries.