

VersaTron Treatment of Equine Foot Maladies



VersaTron[®]

The health of a horse's foot is critical to its overall health and performance, yet there are so many common conditions and injuries that can jeopardize foot health. Diagnosis is often difficult and finding the optimal treatments can be a frustrating endeavor. A previous AAEP report demonstrated the challenge of diagnosis and highlighted some common issues:¹ 35 horses who had pain localized to the foot by regional anesthesia but were not given a specific diagnosis were examined with MRI. The MRI exams revealed that approximately half had damage to the deep digital flexor tendon (DDFT), approximately a third had navicular bone/bursa changes, about 1/3 also had coffin joint distension and approximately 15% showed navicular impar ligament damage.¹ Additional diagnoses included distal interphalangeal joint collateral ligament enlargement and sesamoidean ligament damage. Many horses had more than one ailment.¹ Extracorporeal Shock Wave Technology (ESWT) is a non-invasive treatment option that has long been used for various tendon and ligament injuries and is growing in popularity for other difficult-to-treat conditions such as problems in the foot. ESWT reduces inflammation, causes tissue regeneration and accelerates healing.⁴

Navicular syndrome is challenging in that it is highly prevalent, highly problematic and the complexity of diagnosis can lead to inconsistent treatment outcomes. In 2004, **Scott McClure, DVM, PhD, DACVS, Iowa State University**, presented an evaluation of 32 horses treated with shock wave for navicular syndrome.² The patients were treated one time with 2000 shocks at Energy Level E6 with the VersaTron high-energy focused shock wave device. Dr. McClure recommended approaching through the heel bulbs and the frog and most importantly, soaking the foot the evening before the treatment in order to ensure transmission of shock wave energy through the heel. At six months post treatment unmasked veterinarian evaluation reported that of the 27 horses available for evaluation, 70% of the cases showed improvement at a trot. In addition, 81% of the clients reported improvement. Lameness in the horses that responded to ESWT did not relapse in the 12 month period following treatment and there were no complications associated with ESWT. Dr. McClure concluded that ESWT should be considered as a viable, non-invasive mechanism to navicular syndrome in horses.² Theories of the cause of navicular syndrome include bone remodeling as result of the force between the navicular bone and the deep digital flexor tendon, a decrease in blood supply to the navicular bone, and degenerative joint disease of the affected area.³ ESWT has been shown to be efficacious in treating damaged bone, increasing vascularization in treated areas and decreasing lameness associated with degenerative joint disease.^{4,5}

Collateral ligament desmitis of the coffin joint is another common foot problem, which can be difficult to diagnose. **Tim Mair, BVSc, DEIM, DESTS, Dipl. ECEIM, MRCVS, of the Bell Equine Veterinary Clinic in the United Kingdom** spoke to the difficulty of diagnosis at the AAEP in 2005, reporting that 75-80% of competition and pleasure horses have collateral ligament desmitis that may not be seen with ultrasound since many times the lesions are beneath the hoof capsule.⁶ Dr. Mair uses MRI to diagnose this condition which more clearly shows the increase in fluid and size in and around the ligament. **Tracy Turner, DVM, MS, DACVS, Anoka Equine Vet Services, Minnesota**, noted that the most common finding on an ultrasound for this condition is an enlargement of the ligament and occasionally holes can be seen in the ligaments.⁶ Dr. Turner reports that obtaining the necessary ultrasound image can be time consuming as hoof conformation issues can make it difficult to find the right area to obtain the necessary image. In regard to treatment, Dr. Turner's recommendation is dependent upon the severity of the case and can include stall rest with gradual reintroduction to work, protecting the area with extensions, and casting if the ligament is completely torn; again, all recommendations are made on a case by case basis.⁶ Dr. Turner prefers walking rather than strict stall confinement and endorses the use of shock wave to help speed the healing time, commenting that shock wave can cut the time of healing in half for this condition.⁶ In order to optimize treatment using shock wave, Dr. Turner delivers 2000 shocks total, 1000 of which are split between the injured and non-injured ligament and then an additional 1000 shocks spread out over the entire joint capsule. He uses the highest energy setting and the R05 Trode.

"I've used shock wave and feel it cuts healing time in half on average" - Dr. Turner

Kent Allen, DVM, Virginia Equine Imaging reported on the use of the VersaTron ESWT for use on collateral ligament desmitis of the coffin joint at the SANUWAVE Customer Appreciation Dinner at the 2007 AAEP Annual Meeting.⁷ Dr. Allen was presented with an 8 year old Irish Sport Horse Gelding, a preliminary level event horse which was referred for right front lameness (2-2.5/5), localized with an abaxial nerve block. The lameness had been ongoing for 4 weeks and the horse was nonresponsive to IA therapy. Dr. Allen recommended a course of shock wave therapy and three treatments were performed at three week intervals. The approach with the R20 trode is demonstrated in Figure 1. The gelding improved at 90 days but was still mildly lame. MRI findings showed that the medial collateral ligament was still enlarged but there was decreased signal intensity from the previous scan. Additional rest was advised and two additional shock wave treatments were performed. At the 14 month follow up, the horse was back to competing with hopes of moving up to the intermediate level the following season.⁷



Figure 1.

Tendinitis or avulsion of the Deep Digital Flexor Tendon is a highly prevalent condition that may exist on its own or as a complication of other injuries or conditions including laminitis. ESWT is an extremely effective treatment option for tendinitis as it not only speeds healing, but increases the quality of the healing.⁸ **Alves, et al** reported on the results of ESWT on equine tendon healing, using ultrasonographic and histological techniques. The authors concluded that ESWT allowed significant improvement in the quality of the tendon repair and a favorable prognosis for the horse, primarily due to the improved arrangement of collagen fibers in the treated tendons vs. the control group.⁸ There was indication of a higher speed of maturation of the repair process compared to the control, and ESWT increased the presence of collagen fibers in addition to the parallelism of collagen fibers.⁸ Additionally, there have been a variety of human studies focusing on tendinitis including ESWT effects on insertional and non-insertional Achilles tendinitis.^{9,10} **Chen, et al** reported that ESWT stimulated a significant increase in cell proliferation within 6 weeks of treatment for insertional Achilles tendinitis.¹⁰ Inflammation was resolved and an increase in tenocyte proliferation was observed.¹⁰ The improvement coincided with increases in TGF- β 1 and IGF-I growth factor expression in addition to intensive PCNA expression, which is associated with cell division.¹⁰ ESWT also increases expression of various angiogenic growth factors leading to neovascularization, which can result in better perfusion to an injury or wound site.⁴ Clinical experience supports that insertional deep digital flexor tendinitis at the P3 joint can be successfully managed with ESWT. **Keith Merritt, DVM, Merritt & Associates, Illinois**, reports improvement in 100% of the DDFT cases treated and the patients remain sound for at least an 18 month period.¹¹ Deep Digital Flexor tendon avulsion/tendinitis from P3 should be treated through the frog (with hoof knife preparation and soaking). Two to three treatments are recommended two to three weeks apart.¹²

Scientific study and practice continue to provide useful learnings and direction in the areas of prevention, diagnosis, and treatment of foot conditions in the equine patient. Extracorporeal Shock Wave Technology (ESWT) remains an invaluable tool to

treat a variety of conditions, including those of the foot. ESWT not only speeds healing, but it improves the quality of healing.⁸ Expanding use of ESWT for treatment of more complex conditions may help more patients return to form faster and heal better, leading to better long term results. ESWT can also benefit the practice by contributing to customer satisfaction.

Entry Window	Probe	Energy Setting	Number of Shocks	Treatment Interval
Navicular Syndrome				
Frog and Heel Bulbs	R35 at Frog R20 at Heel Bulb	E6	1000 at Frog 1000 at Heel Bulb	At shoeing intervals
Collateral ligament desmitis of the coffin joint				
See Figure 1	R05 or R20	E6	1000 on ligaments 1000 on entire joint capsule	3 treatments; 2-3 weeks apart
DDFT				
Frog	R35	E6	\geq 1000	2-3 treatments; 2-3 weeks apart

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