

Ultrasonographic Evaluation of Extracorporeal Shock Wave Therapy on Collagenase Induced Superficial Digital Flexor Tendonitis

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Injuries involving the superficial digital flexor tendon (SDFT) are common in performance horses of many disciplines. Many treatment modalities have been used to facilitate healing of these lesions, but there are currently no treatments that stimulate healing to proceed in a timely manner on a consistent basis. The methods that have been employed include prolonged periods of inactivity, controlled exercise programs, anti-inflammatory therapy, intra-lesional injections, peri-tendinous injection of counter-irritants, sclerosing agents, tendon splitting, annular ligament desmotomy, superior check ligament desmotomy, and numerous other therapies. None of these consistently promote healing in a timely fashion to allow earlier return to normal function. The objective of this study was to use the collagenase model to induce lesions and then to assess the rate of healing and histologic characteristics of the healing of tendons treated with ESWT versus untreated lesions. The goal of the study is to determine if ESWT will speed healing and improve quality of healing of SDFT lesions.

Six mature horses were used in a blinded prospective study with untreated contralateral limb controls. Bilateral forelimb SDFT lesions were induced in each horse with collagenase. Ultrasonographic images were captured digitally and image analysis software was used to measure: 1) Percent lesion at the maximum injury zone (MIZ) 2) the gray scale of the SDFT at the MIZ 3) the percent disruption of the longitudinal fibers at the MIZ. The data were also summed for the ten sites from 4-22 centimetres distal to the accessory carpal bone. Physical examinations were performed on 4 occasions during the study to evaluate heat, response to palpation, presence/character of swelling over the SDFT, and lameness score. Measurements of the external width of the SDFT, and thermographic images were also evaluated. At the completion of the study all tendons were evaluated histologically.

There was no significant group by time interactions for any of the 3 variables at the MIZ or the sums for each variable. There was a trend toward a decrease in the external width, and there was a significant difference between the thermographic appearances of treated versus control limbs. There was an increase in neovascularization, increased mitotic activity, and greater degree of cellular reaction in treated tendons compared to untreated control tendons. The histologic changes indicate that ESWT may afford beneficial changes at the cellular level. While it is recognized that these are evaluations based on experimentally induced lesions, there does appear to be a beneficial reaction that takes in tissues in response to ESWT.