EXTRACORPOREAL SHOCK WAVE THERAPY

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Extracorporeal shock wave therapy (ESWT) is very useful for treatment of soft tissue and bone injuries. Focused and non-focused ESWT devices are available for application in horses. Shockwave devices make use of several different methods to generate the energy wave. The wave is a very short duration, high intensity sound wave that physically induces a biological response in the tissue (mechanotransduction). The energy imparted on the tissue releases ATP, increases local growth factor production, recruits and stimulates stem cells and activates PRP. Each treatment usually consists of 2000 pulses. Intensity of shock wave therapy is set in a range of 0.2 to 0.45 mJ/mm^2, or according to the atmospheric pressure at the output probe (2.5 to 4 bar), depending on the manufacturer's recommendations. Treatment protocols require three to five separate treatments spaced at 1 to 3 week intervals. Tissue compression and shear loads occur as the shock wave passes tissue interfaces resulting in stimulation of bone and soft tissue healing. ESWT treatment of arthritis of equine distal tarsal joints (bone spavin) resulted in improvement of lameness grade in 59 of 74 horses treated.

Treatment protocols:

Impulses:
Small lesions, such as a collateral ligament of the distal interphalangeal joint, requires 1000 impulses per treatment. The average suspensory desmitis site requires 2000 impulses per treatment. Large areas of the back may require a total of 3000 impulses for each treatment.

Energy levels:

- Soft tissue injuries less than 4cm deep to the skin: 0.2-0.35 mJ/mm^2.
- Soft tissue and bone in the heel region: 0.35-0.45 mJ/mm^2. These are higher levels than the previous example because the penetration of energy is not as efficient.
- Backs disorders: 0.45-0.55 mJ/mm^2. Higher levels because of the deep muscle mass overlying the target tissues.
- Bucked shins and incomplete fractures: 0.35-0.55 mJ/mm^2.
- Osteoarthritis: 0.15-0.3 mJ/mm^2.
- Wounds: 0.1-0.15 mJ/mm^2

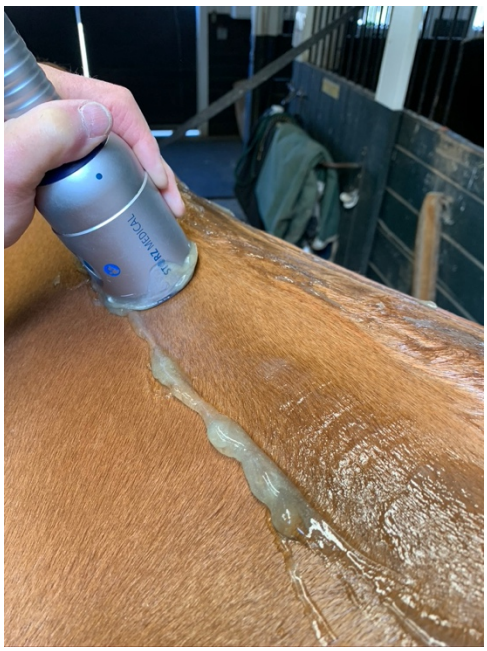
Focus depth:
The focus point for ESWT should be the average depth of the lesion from the skin. Some ESWT devices use gel standoffs to focus the energy depth and other devices use hand pieces with different focus depths. The machine I use has a wide effective treatment zone around the focus point. The 30mm standoff on my device has a focal area of 15-45mm with therapeutic effect between 0 and 105mm.

Aftercare and treatment intervals: For horses in exercise, I ask for grazing only or stall rest for two days following treatment. The horse then returns to the recommended rehabilitation exercise protocol. Some individuals recommend administering NSAIDS and cold therapy for three days following each ESWT. I do not use these ancillary treatments because I believe that the mild tissue inflammation associated with ESWT is a beneficial effect. ESWT treatment is conducted at 2–3 week intervals for 3 sessions. The horse undergoes a full recheck

examination two weeks following the third ESWT. At that examination, the decision is made to continue further ESWTs, stop treatment or to change treatment modalities.

Shockwave therapy cannot be used within 5 days of FEI competition or 3 days of USEF competition. USEF has an exception for shockwave therapy of the back and dorsal pelvis, where treatment may be conducted up to 12 hours before competition.

Shockwave treatment of the back



Shockwave treatment of a rear suspensory injury