

Extracorporeal Shock Wave Therapy

By Dr. Ken Spresser

Extracorporeal Shock Wave Therapy (ESWT) is the use of shock waves for orthopedic applications. We are more familiar with lithotripsy which is synonymous with ESWT. Lithotripsy is more commonly used with renal calculi, urolithiasis, pseudoarthroses, pancreatic ductal stones and calcific tendonitis. The aim of this article is to expand on the use of ESWT for plantar fasciitis, shoulder tendonitis, and epicondylitis.

In the 1980's shock wave therapy was introduced in Germany to treat pseudoarthroses and slow healing fractures. Since then lithotripsy has evolved to "softer components" such as ligaments. To date over 50,000 ESWT procedures have been performed in Germany, where there is now substantial clinical evidence supporting the efficacy of shock wave therapy for tendonitis. German health insurance covers ESWT one hundred percent.

The shock wave system utilizes electromagnetic technology to generate a shock wave. The electromagnetic emitter works on a similar principal to a loud speaker. According to the literature the mechanism of analgesia produced by low energy shock wave therapy is uncertain. However, three hypotheses have been promulgated:

1. Shock waves stimulate the metabolic reaction of tissue, causing development of stress fibers and/or change in membrane permeability.
2. Shock waves create cavitation bubbles, which break down/ change the consistency of calcific deposits.
3. Shock waves induce an analgesic effect by over-stimulating the axons (Gate-control Theory), thereby increasing a person's pain threshold.

The shock wave emitter (lithotripter) is docked onto the tendon area (elbow, shoulder, foot) by means of a water-filled cylinder with ultrasound gel used as a contact medium between the cylinder and skin. The average treatment time is about thirty minutes, however, some applications are a few seconds which is applied at the site of greatest discomfort. ESWT usually takes one-three sessions with about 2,000 shock wave blasts in each session. The feeling for the patient is considered a moderate to intense sensory input. The area of focus is about 1.5-2 cm. and treatments are done about one week apart. In two German studies on epicondylitis, no anesthesia was used and none of the patients were unable to tolerate the discomfort produced by the shock waves. In animal studies, low energy shock waves did not show any histologic changes or tendon damage, however, damage has been observed after application of high energy ESWT. Success rates have been good to excellent for subjective outcomes of a significant decrease in pain as well as objective outcomes for significant increase in strength. Low energy extracorporeal shock wave therapy is a legitimate and useful non-invasive therapy for people suffering from chronic pain and as an alternative to surgery. Approval from the FDA was expected in October 2001. Be sure to check with your Chiropractic State Board before proceeding with ESWT.

References:

Rompe et al, Analgesic Effect of Extracorporeal Shock Wave Therapy on Chronic Tennis Elbow, *The Journal of Bone and Joint Surgery*, March 1996, Vol 76-B, No.2, Pgs 233-237.

Rompe et al, Low-energy Extracorporeal Shock Wave Therapy for Persistent Tennis Elbow, *International Orthopedics*, May 1996 20: pgs. 23-27.

Global Lithotripsy Services, LLC, <http://www.gls-lithotripsy.com/Ortho.html>