

Why are Extracorporeal Shock Waves the Last Alternative Therapy?

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The terms tendonitis, tendinosis and paratendonitis or an association of them, should be reserved to specific histopathological features of tendon conditions. Unfortunately the term tendonitis is used in a clinical context and it refers to a clinical syndrome and not to a specific histopathological entity. Tendinosis represents a chronic musculoskeletal disorder that can cause pain and impaired function. Tendon healing is a complex process requiring inflammatory response, neoangiogenesis, fibrillogenesis and matrix remodeling (Enwemeka 1989). Many events can happen to impair the normal healing of tendons. One of them is persistent overuse in sports without time to recover and it can induce the degenerative process. The term tendinosis, first used by Puddu (Puddu 1976), implies tendon degeneration without clinical or histological signs of intratendinous inflammation and is the final result of a number of pathological processes with slightly different histological manifestations.

Many therapeutic options are used by doctors but none of them with optimum results. Extracorporeal shock waves are used only after other therapies have failed, despite experimental studies demonstrating significant improvement in patellar tendinosis (Wen-Wei Hsu 2004) and promoting healing of collagenase-induced Achilles tendonitis and increased TGF β 1 and IGF-I expression (Chen and Wang 2003). Tendon healing in the early stages depends on the tenocytes growth and neovascularization. The tenocytes have been found to convert biophysical stimulation into a biochemical response leading to release of growth factors and cellular adaptation. TGF β and IGF I can promote tendon regeneration by regulating collagen metabolism and tenocytes proliferation. It is important to avoid repetitive chronic inflammation because this can develop non-healing stages and promote alterations in growth factors. Collagen synthesis is strongly influenced by a number of growth factors. These include TGF β , IL -1, IL-4, PDGF, IGF 1-2 and EGF.

In a study on collagen production on rabbits, it was found that TGF β 1 and IGF-2 not only increases collagen production but also differentially affects the ratios of collagen I and III. These effects were most pronounced in 3 week-old scars and were observed to have a decreasing effect at 6 -12 weeks. I believe that to produce a better scar it is necessary to begin with ESWT before the first month.

The best healing is the faster healing and ESWT is an option to promote better results.