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Scientific Literature Overview

Radial SWT

Shockwave Therapy for the Treatment of Chronic Proximal Hamstring Tendinopathy in Professional Athletes

Authors	Angelo Cacchio, Jan D. Rompe, John P. Furia, Piero Susi, Valter Santilli, Fosco De Paulis
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Date	Sept 2010
Place of origin	Sciuba Diagnostic Imaging and Rehabilitation Center, Sulmona, Italy
Background	Chronic Proximal Hamstring Tendinopathy (PHT) is an overuse syndrome of unknown origin that is associated with a degenerative process of the hamstring tendons, particularly of the semimembranosus tendon. Clinically, patients with PHT report gradually increasing pain at the level of the ischial tuberosity. Some patients report radiating pain from the ischial tuberosity to the popliteal fossa while sitting for a prolonged time or during sports activities. Chronic proximal hamstring tendinopathy is an overuse syndrome that is usually managed by nonoperative methods. Shockwave therapy has proved to be effective in many tendinopathies.
Objective	To evaluate the effectiveness and safety of Shock Wave Therapy (SWT), and to compare the effects of SWT with those of traditional conservative thearapy (TCT) in patients with chronic PHT.
Tested products	Radial shockwave generator (EMS Swiss Dolorclast, Milano, Italy)
Study design & methods	**Randomized controlled clinical study**; Level of evidence, 1. 40 professional athletes with chronic proximal hamstring tendinopathy were enrolled between February 1, 2004, and September 30, 2006. Patients were randomly assigned to receive: - shockwave therapy, consisting of 2500 impulses per session at a 0.18 mJ/mm² energy flux density without anesthesia, for 4 weeks (SWT group, n = 20), or - traditional conservative treatment consisting of nonsteroidal anti-inflammatory drugs, physiotherapy, and an exercise program for hamstring muscles (TCT group, n = 20). Patients were evaluated before treatment, and 1 week and 3, 6, and 12 months after the end of treatment. ***Primary outcome measures:*** - Visual analog scale (VAS) score for pain - Nirschl phase rating scale (NPRS). The NPRS is a 7-phase (1-7) assessment of pain and activity limitations caused by overuse injuries. ***Secondary outcome measures:*** - number of patients who achieved a reduction of at least 50% in the VAS score from the baseline to both 1 week after the end of treatment and 3 months after the end of treatment. - degree of recovery from the baseline to 3 months after the end of treatment, measured on a 6-point Likert scale ("completely recovered" to "much worse").
Results	The patients were observed for a mean of 10.7 months (range, 1-12 months). Six (5 TCT and 1 SWT) patients were lost to follow-up because they underwent a surgical intervention. Primary follow-up was at 3 months after the beginning of treatment. - ***VAS pain scores***: a significant improvement in the mean VAS score was observed in the

	SWT group, while no significant difference was observed in the TCT group 3 months after the end of treatment The VAS scores in the SWT and TCT groups were 7 points before treatment, and 2 points and 7 points, respectively, 3 months after treatment. - ***NPRS scores***: a significant improvement was observed in the SWT group at 3 months after the end of treatment, whereas there was a significant worsening in the TCT group at the same time point. NPRS scores in the SWT and TCT groups were 5 points in either group before treatment, and 2 points and 6 points, respectively, 3 months after treatment. - ***Pain reduction of >50%***: At 3 months after treatment, 17 of the 20 patients (85%) in the SWT group and 2 of the 20 patients (10%) in the TCT group achieved a reduction of at least 50% in pain. - ***Degree of recovery:*** The Fisher exact test revealed that the percentage of patients with Likert scale scores of "1" (completely recovered) or "2" (much improved) (ie, successful results) at 3 months after the end of treatment was significantly higher in the SWT group than in the TCT group. At 3 months after the end of treatment, no patients in the SWT group but 7 patients (35%) in the TCT group reported a worsening in symptoms compared with the pretreatment symptoms. - ***Return to sports***: 3 months after the end of treatment, 16 (80%) of the 20 patients in the SWT group were able to return to their preinjury professional level of sports activity. The mean time taken to return to their preinjury professional level of sports activity was 9 weeks. None of these patients have had any reinjury during the 12-month follow-up period. By contrast, none of the patients in the TCT group were able to return to their preinjury professional level of sports activity at the same time point - ***Complications:*** There were no serious complications in the SWT group.
Conclusion	This study demonstrates that **SWT** is a **safe** and **effective** treatment for chronic PHT and adds to the growing number of favorable reports pointing to the efficacy of SWT as a treatment for chronic tendinopathies.
Key message	Significantly better results with radial shockwave therapy for Proximal Hamstring Tendinopathy than with traditional conservative (NSAID + PT) treatment.

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Scientific Literature Overview

Radial SWT

Chronic Plantar Fasciitis Treated with Two Sessions of Radial Extracorporeal Shock Wave Therapy

Authors	Mahmoud I. Ibrahim, Robert A. Donatelli, Christoph Schmitz, Madeleine A. Hellman, Frederick Buxbaum
Published	Foot & Ankle International, Volume 31, No. 5, pp. 391-397
Date	May 2010
Place of origin	Rocky Mountain University of Health Professions, Brooklyn, New York
Background	In a previous study by Gerdesmeyer et al. (AJSM, 2008) was shown that RSWT is effective for plantar fasciitis treatment when administered in 3 sessions.
Objective	To test whether two sessions of RSWT can also be effective for treating plantar fasciitis.
Tested products	EMS Swiss Dolorclast (EMS Electro Medical Systems Corp, Dallas, TX)
Study design & methods	Randomised controlled study. A total of 50 patients with unilateral, chronic PF were randomly assigned to either RSWT (n = 25) or placebo treatment (n = 25). RSWT was applied in two sessions 1 week apart (2,000 impulses with energy flux density = 0.16 mJ/mm2 per session). Placebo treatment was performed with a clasp on the heel. Endpoints for pain assessment were changes in the Visual Analog Scale (VAS) score and the modified Roles & Maudsley (RM) score from baseline to 4 weeks, 12 weeks and 24 weeks followup.
Results	▪ The mean VAS scores were reduced after RSWT from 8.5 ± 0.3 (mean ± SEM) at baseline to 0.6 ± 1.5 at 4 weeks (−92.5%), 1.1 ± 0.3 at 12 weeks (−87.3%) and 0.5 ± 0.1 at 24 weeks (−93.9%) from baseline. ▪ The mean RM scores were changed after RSWT from 3.8 ± 0.1 at baseline to 1.2 ± 0.1 at 4 weeks (−68.1%), 1.4 ± 0.2 at 12 weeks (−61.7%) and 1.3 ± 0.1 at 24 weeks (−64.9%) from baseline. ▪ These changes in mean VAS and RM scores were not observed after placebo treatment. The mean VAS scores of the placebo-treated patients were 8.9 ± 0.2 at baseline, 7.6 ± 0.4 at 4 weeks (−15.2%), 7.7 ± 0.2 at 12 weeks (−13.5%) and 7.4 ± 0.5 at 24 weeks (−17.0%) from baseline. Likewise the mean RM scores of the placebo-treated patients were 3.8 ± 0.1 at baseline, 3.6 ± 0.1 at 4 weeks (−6.3%), 3.2 ± 0.2 at 12 weeks (−15.8%) and 3.2 ± 0.2 at 24 weeks (−16.8%) from baseline. ▪ Statistical analysis demonstrated that RSWT resulted in significantly reduced mean VAS scores and mean RM scores at all followup intervals compared to placebo treatment (each with $p < 0.001$). ▪ No serious adverse events of RSWT were observed.
Conclusion	The authors conclude that RSWT was a safe, effective and easy treatment for patients with chronic PF and successful treatment can be achieved with only two sessions of RSWT which increases the attractiveness of this treatment method. The authors recommend considering RSWT treatment for every patient with chronic plantar fasciitis who is irresponsive to conventional treatment.
Key message	RSWT was successful in the treatment of chronic PF even when only two sessions with 2,000 impulses each were performed 1 week apart.