

ESWT for Chronic Achilles tendinopathy



המרכז הישראלי לטיפול בגלי הלים (2005)

ד"ר דן צין, מומחה באורתופדיה



ELSEVIER

Contents lists available at [ScienceDirect](#)

International Journal of Surgery

journal homepage: www.journal-surgery.net



Review

Current evidence of extracorporeal shock wave therapy in chronic Achilles tendinopathy



Ludger Gerdesmeyer ^{a, e, *}, Rainer Mittermayr ^b, Martin Fuerst ^a, Munjed Al Muderis ^c,
Richard Thiele ^a, Amol Saxena ^d, Hans Gollwitzer ^e

^a Dept. Orthopaedic Surgery and Traumatology, University Schleswig Holstein, Campus Kiel, Arnold Heller Strasse 3, 24105 Kiel, Germany

^b Stosswellenzentrum-wien.at, AUVA Trauma Center Meidling, Ludwig Boltzmann Institute for exp. and clin. Traumatology, Austria

^c Suite G3B, Norwest Private Hospital, 9 Norbrik Drive, Bella Vista, NSW 2153, Australia

^d Palo Alto Medical Foundation, 795 El Camino Real, Palo Alto, CA 94301, USA

^e Technical University of Munich, Dept. Orthopedics and Traumatology, Ismaninger Straße 22, D-81675 Munich, Germany

H I G H L I G H T S

- This review shows efficacy of extracorporeal shock wave therapy.
- Focused and radial shock waves both show efficacy in chronic Achilles tendinopathy.
- All treatments should be done without local anesthesia.

Table 1
ESWT evidence on Achilles tendinopathy (insertional and non insertional).

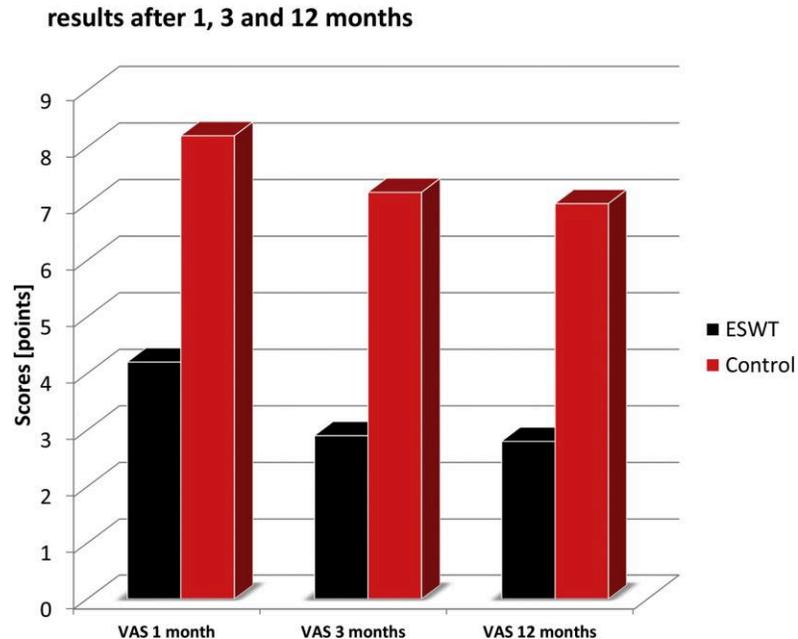
Authors	Article	Sample	Groups	Generator	Device	Impulses	No treatment	AE	Energy	FU	Significance	Conclusion
Focused												
Furla	Am. J. Sports Med. 2006	68	High-ESWT vs control	EM	Dornier	3000	1	No	0.21	3, 6, 12 mo	S	High ESWT is better than conservative Tx, negative effect of LA NSS on Pain but clinical relevant effect size was found
Costa	CORR	49	High-ESWT vs placebo	EM	Storz Modulith_x0001_SIX	2000	3	2	0.2 vs 0	3, 12 mo	NS	
Furla	Am. J. Sports Med. 2008	68	High-ESWT vs control	EM	Dornier	3000	1	No	0.21	3, 6, 12 mo	S	High-ESWT: effective in chronic non insertional Achilles tendinopathy ESWT an excellent option in Achilles tendinopathy
Rasmussen	Acta orthopaedica 2008	48	High vs placebo	Piezo	Wolf	2000	4	No	0.12–0.51 vs 0	3 mo	S	
Rompe 2007	Am. J. Sports Med. 2007	46	Radial ESWT vs wait and see vs eccentric exercises	Radial	EMS medical	2000	3	No	0.1	6 wks, 16 wks	S	Radial ESWT an excellent option in Achilles tendinopathy
Rompe 2008	Am. J. Sports Med. 2008	68	Radial ESWT vs ESWT + eccentric exercises	Radial	EMS medical	2000	3	No	0.1 vs 0	6 wks, 16 wks	S	

(AE: Adverse event; ESWT: Extracorporeal Shockwave Treatment; EM: electromagnetic; wks: weeks; mo: months; NS: not statistically significant, S: significant).

J.P. Furia

High-energy extracorporeal shock wave therapy as a treatment for insertional Achilles tendinopathy

Am. J. Sports Med., 34 (2006), pp. 733-740



Prospective match paired controlled study: level of evidence 3.

35 shock wave treatment , 33 control group

ESWT - 1 application of high-energy extracorporeal shock wave therapy (3000 shocks; 0.21 mJ/mm²; total energy flux density, 604 mJ/mm²).

The shock wave group was further stratified whether to get ESWT under [local anesthesia](#) (LA) or non local anesthesia (NLA) such as regional [nerve blocks](#). (LA subgroup, 12 patients, NLA subgroup, 23 patients).

One month, 3 months, and 12 months after treatment, the mean VAS for the control and ESWT groups were 8.2 and 4.2 (P < 0.001), 7.2 and 2.9 (P < 0.001), and 7.0 and 2.8 (P < 0.001), respectively.

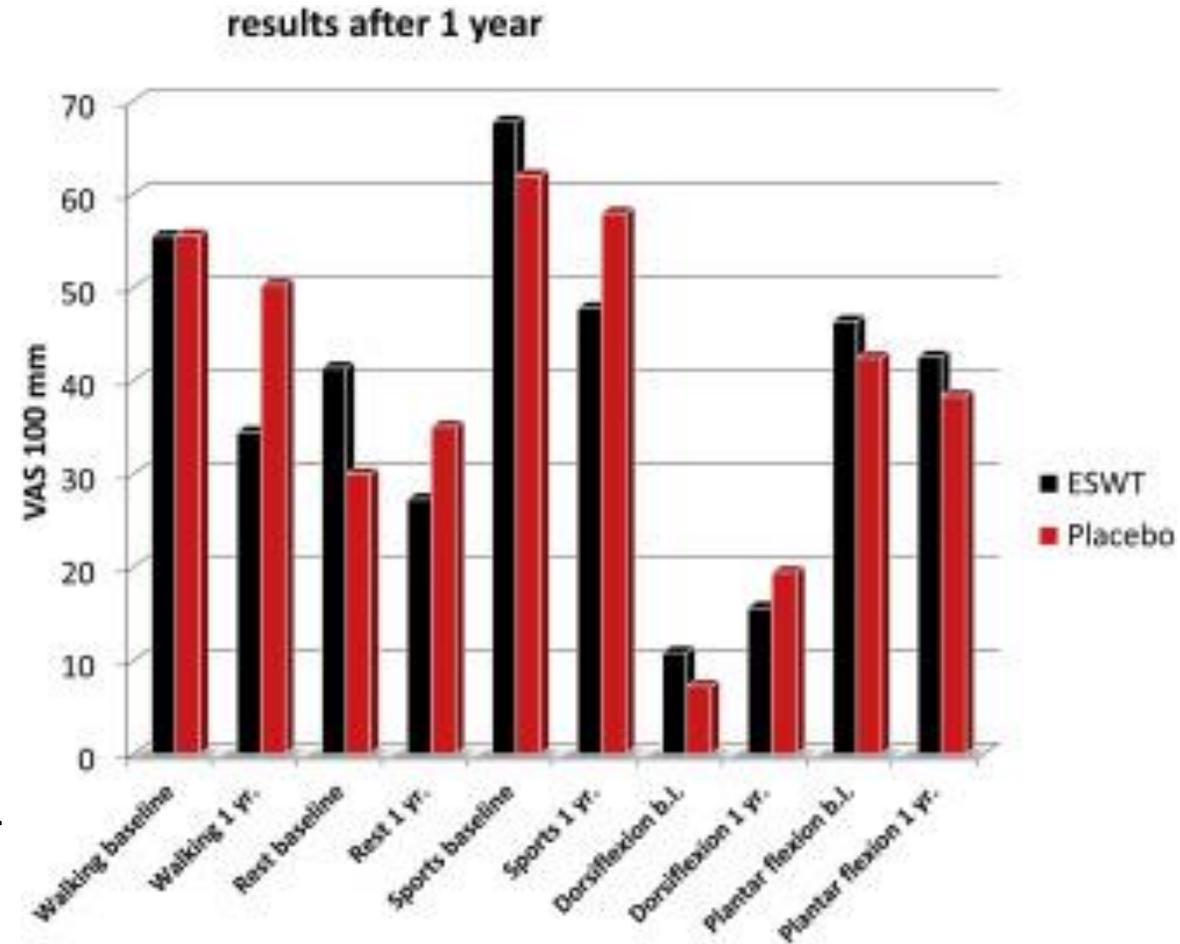
Twelve months after treatment 83% of ESWT group patients having a successful result (P > .0002)

the mean improvement in VAS for the LA subgroup was significantly less than that in the NLA subgroup (P < 0.001). The percentage of patients with successful Roles and Maudsley scores did not differ among the LA and NLA subgroups.

Extracorporeal shock wave therapy is an effective treatment for chronic insertional Achilles tendinopathy and local field block anesthesia may decrease the effectiveness of this procedure.

M.L. Costa, L. Shepstone, S.T. Donell, T.L.Thomas
Shock wave therapy for chronic Achilles tendon pain: a randomized placebo-controlled trial
Clin. Orthop. Relat. Res., 440 (2005), pp. 199-204

Double-blind randomized placebo controlled trial level 1 of evidence
49 patients
3 insertional, 46 midsubstance swelling
ESWT once a month for 3 months
the confidence intervals do include a potentially clinically relevant treatment effect.
Complications in the treatment group included two [tendon ruptures](#), suggesting caution in treating older patients with shock wave therapy.



J.P. Furia

High-energy extracorporeal shock wave therapy as a treatment for chronic noninsertional Achilles tendinopathy

Am. J. Sports Med., 36 (2008), pp. 502-508

Case controlled study; level 3 of evidence.

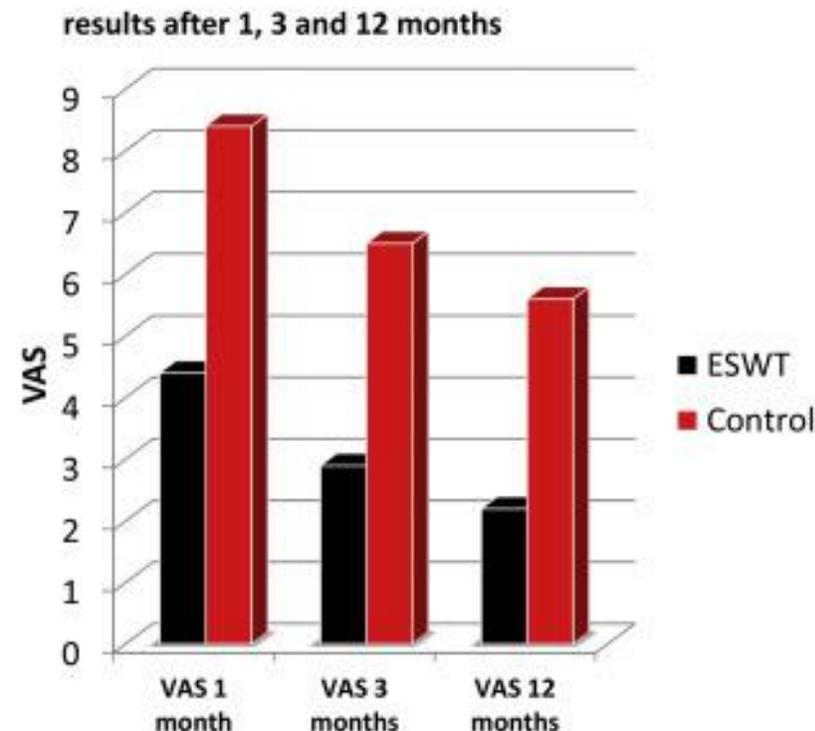
34 patients with chronic non insertional Achilles tendinopathy

Single dose of high-energy 3000 shocks using regional anesthesia

As control 34 patients got a nonsurgical therapy.

12 month after completing the ESWT the number of excellent, good, fair, and poor results for the shock wave therapy and control groups were 12 and 0 ($P < 0.001$), 17 and 9 ($P < 0.001$), 5 and 17 ($P < 0.001$), and 0 and 8 ($P < 0.001$), respectively.

The authors recommended ESWT as an excellent option in chronic noninsertional Achilles tendinopathy



S. Rasmussen, M. Christensen, I. Mathiesen, O. Simonson

Shockwave therapy for chronic Achilles tendinopathy: a double-blind, randomized clinical trial of efficacy

Acta Orthop., 79 (2008), pp. 249-256

Double-blind, [randomized clinical trial](#) ; level 1 of evidence

Local anesthetics were not used.

ESWT sham or active treatment was given at 4 sessions once a week. Each session with 2000 shots (0.12–0.51 mJ/mm², of focussed shock waves.

48 patients ; 3 months FU

The AOFAS score after treatment increased ($p = 0.05$), from 70 to 88 in the intervention group and from 74 to 81 in the control group.

Better results were seen in the intervention group at 8 and 12 weeks of follow-up ($p = 0.01$ and $p = 0.04$, respectively).

Also pain was reduced in both groups, but there was no statistically significant difference between the groups.

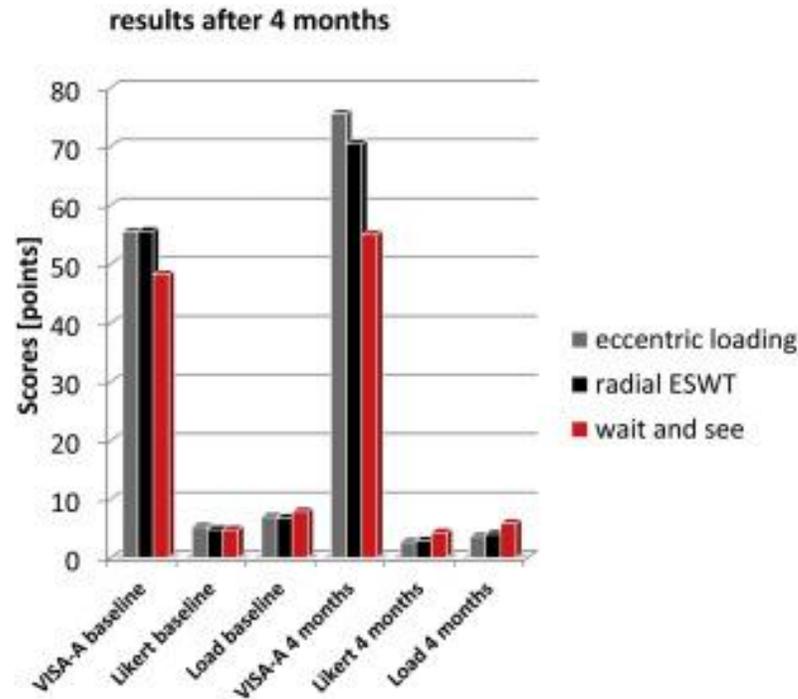
This study supports ESWT in chronic Achilles tendinopathy as an excellent option.

J.D. Rompe, B. Nafe, J.P. Furia, N. Maffulli
Eccentric loading, shock-wave treatment, or a wait-and-see policy for tendinopathy of the main body of tendo Achillis: a randomized controlled trial

Am. J. Sports Med., 35 (2007), pp. 374-383

3 management strategies: group 1, eccentric loading; group 2, repetitive radial shock wave shock-wave therapy (rESWT); and group 3, wait and see.

75 pts



J.D. Rompe, J. Furia, N. Maffulli
Eccentric loading compared with shock wave treatment for chronic insertional achilles tendinopathy. A randomized, controlled trial

J. Bone J. Surg. Am., 90 (2008), pp. 52-61

randomized prospective controlled.
 68 pts. midportion tendinopathy
 eccentric training plus SWT should be offered to patients with chronic recalcitrant midportion tendinopathy of the Achilles tendon.

