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DEPARTMENTS

Letter to the Editor

Importance of the Correct Use of Extracorporeal Shockwave Therapy

We read "Comparison of Peritendinous Hyaluronan Injections Versus Extracorporeal Shock Wave Therapy in the Treatment of Painful Achilles' Tendinopathy: A Randomized Clinical Efficacy and Safety Study"[1] with great interest and congratulate the authors for their comprehensive overview on Achilles' tendinopathy (AT). However, a major shortcoming of this article is the flawed methodology concerning study design and extracorporeal shock wave treatment (ESWT) protocol (table 1).

The inclusion criteria specified Achilles tendinopathy (AT) for 6 weeks duration, although most studies indicated ESWT for chronic recalcitrant AT from 3 months.[2-5] Lynen et al[1] did not mention whether patients received other treatment modalities, such as physiotherapy or steroid injection, less than 6 weeks before or after this time, which may have influenced the outcome favorably.

When applying ESWT in tendons, the clinical diagnosis should be confirmed by radiography, ultrasonography, or magnetic resonance imaging to rule out partial rupture or calcification. Both would lead to a different prognosis. However, in the present study, no complementary diagnostic studies were performed to specify midportion AT.

Further, the device is not used in accordance with chronic tendinopathy protocols[3-5] recommended by the International Society for Medical Shockwave Treatment and thoroughly tested by the community (or published in the literature).

Lynen[1] described an energy dose of level 14 (.65mJ/mm^2) to 15 (.71mJ/mm^2) with the piezoelectric device, which is excessively high for the treatment of an aching tendon. The standard dosage to treat midportion AT is a low- to midenergy dose (up to .28mJ/mm^2).[2,3,5,6] In this study, more than double the energy of the recommended dose has been used, although high energy levels of .60mJ/mm^2 have been shown to cause marked damage to the tendon and paratendon with an increase of the diameter and fibrinoid necrosis.[6] With the use of a penetration depth of 1cm, the focus is placed in a too deep position and not on the target location. This possibly explains why patients nonetheless tolerated the high intensity, as most of the energy was not exactly placed in the midportion of the painful Achilles' tendon. This high energy can also activate nociceptors of an asymptomatic Achilles' tendon, which would explain why the treatment was experienced as more painful than the injection of hyaluronic acid.

Surprisingly, no localization method has been described for the application of ESWT. A standard procedure to localize midportion AT is clinical feedback, focusing on pain and swelling,[3-5] or using ultrasonography. In the present article, instead we read about a 94° aperture angle[1], which is a technological detail of all piezoelectric energy sources, but not a medical way of application.

Also, when considering the number of impulses, 1500 per session (total 4500) is not a standard recommendation. More impulses would have been needed, as described by Rasmussen et al[4] who also used a piezoelectric device in AT with 2000 impulses in 4 sessions (8000), which is, compared with 4500 impulses, almost twice as much.

Last, the posttreatment schedule is not considered, and patients were allowed to exercise and play sports with the only restriction of avoiding "excessive sports or physical activities."[1(p. 65)] Activities that could be carried out with pain medication were thus permitted in the study.

In the treatment protocols of successful AT studies, the full effect of ESWT is achieved by administering a daily exercise program when sports activities are stopped.[2-5]

In conclusion, incorrect methodology and inappropriate use of the shock wave device may benefit hyaluronic acid over ESWT. Recent trends favor minimally invasive treatment modalities for AT such as ESWT, which has been shown to be a regenerative procedure, noninvasive, safe, and effective when used primarily for individuals with specific chronic musculoskeletal disorders.

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Table 1 Differences of ESWT parameters in AT

ESWT Protocol for AT	Lynen et al[1]	Evidence-based Medicine ESWT Protocol
Inclusion criteria: symptoms duration of AT	>6wk	>3mo
No. of treatment sessions	3	4
No. of impulses (total)	1500 (4500)	2000 (8000)
Energy flux density	High energy (.65—.71mJ/mm^2)	Low- to midenergy (.05—.28mJ/mm^2)
Localization	Technological, not medical details	Clinical feedback, focusing on swelling, US
Post-ESWT schedule	Sports allowed except excessive activities	Stop sports activities

Abbreviation: US, ultrasound.

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