Communication

Radial Extracorporeal Shock Wave Therapy for Insertional Achilles Tendinopathy: Energy Matters

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Radial Extracorporeal Shock Wave Therapy for Insertional Achilles Tendinopathy: Energy Matters

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Abstract: Radial extracorporeal shock wave therapy (rESWT) is an established modality in the management of Achilles tendinopathy. A recent study published in Clinical Rehabilitation reported that the addition of rESWT to exercise and education did not lead to improvements in pain, function or other outcomes compared to the addition of sham rESWT at 6 or 12 weeks post-baseline in individuals with insertional Achilles tendinopathy. The authors concluded that any benefits of rESWT in the management of insertional Achilles tendinopathy may be explained by a placebo mechanism. We respectfully suggest that this conclusion, though likely justified in the light of the results obtained, is to be restricted to rESWT performed in this study, but should not be generalized to all rESWT: the energy of the radial extracorporeal shock waves applied in this study is not high enough to result in a positive clinical outcome.

Keywords insertional Achilles tendinopathy; radial extracorporeal shock wave therapy; rESWT

Radial extracorporeal shock wave therapy (rESWT) is an established modality in the management of Achilles tendinopathy [1–6]. A recent study published in Clinical Rehabilitation questioned the value of rESWT in the management of insertional Achilles tendinopathy [7]. Specifically, Alsulaimani et al. [7] reported no significant difference in the mean VISA-A score at 12 weeks post-baseline (W12) between patients who were randomly allocated to either rESWT and a specific exercise program (n=38; baseline: 44.8 ± 15.1 (mean ± standard deviation); W12: 66.4 ± 15.2; Δ = +21.6) or to sham rESWT and the same exercise program (n=38; baseline: 49.4 ± 15.1; W12: 64.6 ± 15.2; Δ = +15.2), respectively [7]. These data contradict a previous study on rESWT for insertional Achilles tendinopathy [2], which was not cited by Alsulaimani et al. [7] In that investigation [2], the mean VISA-A score of patients who were randomly allocated to rESWT (n=25) improved from 53.2 ± 5.8 at baseline to 79.4 ± 10.4 at four months post-baseline (M4; Δ = +26.2), and, in patients who were allocated to eccentric loading (n=25), from 52.7 ± 8.4 to 63.4 ± 12.0 at M4 (Δ = +10.7) [2]. Furthermore, in another previous study [3] on rESWT for midbody Achilles tendinopathy (again not cited by

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Alsulaimani et al. [7]), the mean VISA-A score of patients who were randomly allocated to a combination of rESWT and eccentric loading (n=34) improved from 50.2 ± 11.1 at baseline to 86.5 ± 16.0 at M4 (Δ = +36.3), and, in patients who were allocated to eccentric loading alone (n=34), from 50.6 ± 10.3 to 73.0 ± 19.0 at M4 (Δ = +22.4) [9].

Collectively, these data do not support the conclusion by Alsulaimani et al. [7] that any benefits of rESWT in the management of insertional Achilles tendinopathy may be explained by a placebo mechanism. Rather, these findings raise the legitimate hypothesis that the radial shock waves (rESWs) applied by Alsulaimani et al. [7] did not have enough energy to produce a significant therapeutic effect.

The rESWT device used by Alsulaimani et al. [7] was an Intellect RPW2 (Chattanooga, USA); 3000 rESWs per treatment session were generated by an air pressure between 2 and 5 bar at a frequency of 10 Hz. To our knowledge, no study has demonstrated the energy flux density (EFD) [8–10] generated by this rESWT device. However, without specifying the EFD, no statement can be made about the effectiveness of the rESWs applied by Alsulaimani et al. [7], because there is no direct relationship between the air pressure at which a pneumatic rESWT device is operated and the EFD of the generated rESWs [9,10]. Furthermore, different rESWT devices can generate rESWs with similar EFD at frequency of 1 Hz, but with substantially different EFD when operated at 10 Hz or at even higher frequencies [10].

The treatment success of rESWT primarily depends on the EFD of the applied rESWs, rather than on the cumulated EFD applied during a treatment session [11–13]. In this respect, rESWs are no different from focused extracorporeal shock waves [14], which are also effective in the management of Achilles tendinopathy [5,6,15]. Thus, the EFD of the rESWs applied by Rompe et al. [2] in the management of insertional Achilles tendinopathy (3 treatment sessions; 2000 rESWs per session; Swiss DolorClast (Electro Medical Systems, Nyon, Switzerland); 2.5 bar) was sufficient for this indication, whereas the rESWs applied by Alsulaimani et al. [7] likely were not.

In summary, we suggest that the conclusions that (i) the addition of rESWT to exercise and education did not lead to improvements in pain, function or other outcomes compared to sham at 6 or 12 weeks post-baseline in patients with insertional Achilles tendinopathy, and (ii) any benefits of rESWT in the management of insertional Achilles tendinopathy may be explained by a placebo mechanism, have to be restricted to the specific rESWT device used by Alsulaimani et al. [7], but not to rESWT in general. While the study [7] was performed well, the EFD of the rESWs was simply not high enough to produce a positive clinical outcome.

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