

Shockwave Therapy: Radial vs. Focused

Soheil Mansour Sohani

Iran University of Medical Sciences, Iran

Abstract

Working principle of focused and radial extracorporeal shock wave technology

In case of focused shock waves, single acoustic pulses are generated either with a spark-gap (electrohydraulic principle), a technology similar to a loudspeaker (electromagnetic principle) or piezocrystals (piezoelectric principle). By means of reflectors of certain shape, the acoustic pulses are converted into a focused acoustic pressure wave/shock wave with a point of highest pressure at the desired target within pathological tissue. In case of radial shock waves, a projectile is fired within a guiding tube that strikes a metal applicator placed on the skin. The projectile generates stress waves in the applicator that transmit pressure waves into tissue. It is of note that any disturbance in the pathway of the acoustic pulses between a focused shock wave source and the target within tissue (such as bone, calcifications, etc.; grey dots in the figures) may result in some parts of the acoustic pulse not reaching the target and, thus, weakening the shock wave energy (i.e. the energy flux density) at the target.

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***Corresponding author:** Iran University of Medical Sciences, Iran. Email: mansorsohani.s@iums.ac.ir

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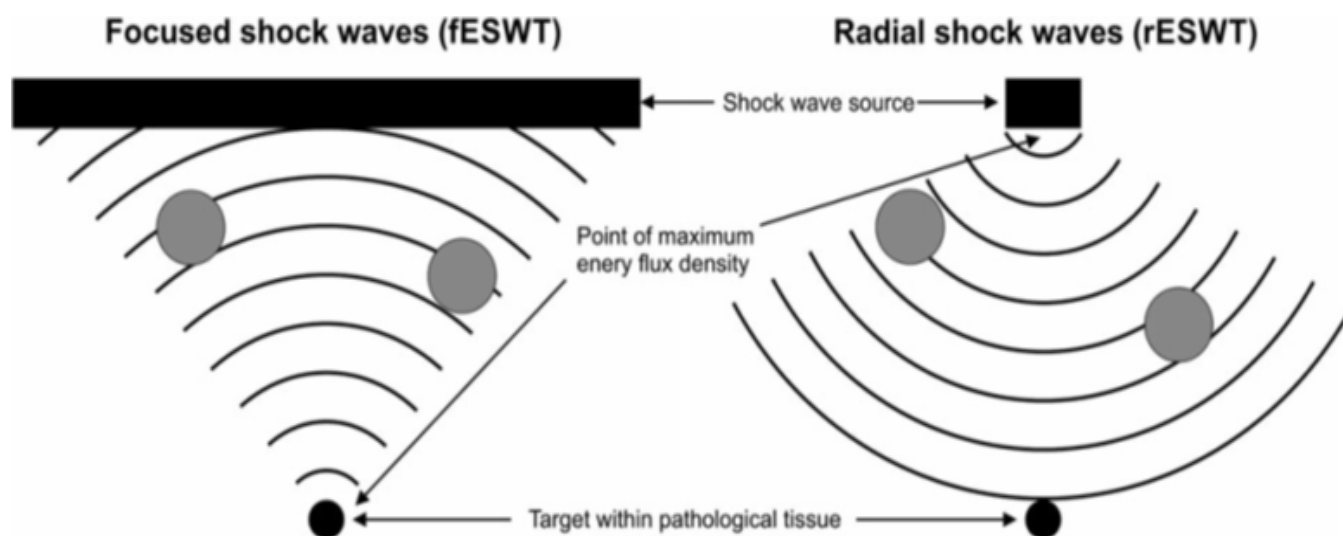


Table 5 Main statements about ESWT based on the RCTs on rESWT and fESWT listed in the PEDro database

No.	Statement
1	ESWT is effective.
2	ESWT is safe.
3	For certain orthopedic conditions, RCTs on ESWT were the predominant type of RCT listed in the PEDro database and/or obtained the highest PEDro scores among all investigated treatment modalities.
4	There was no difference in the 'quality' of RCTs on ESWT in PEDro with positive or negative outcome.
5	Application of local anesthesia adversely affects outcome of ESWT.
6	Application of insufficient energy adversely affects outcome of ESWT.
7	There is no scientific evidence in favor of either rESWT or fESWT with respect to treatment outcome.
8	The distinction between radial ESWT as 'low-energy ESWT' and focused ESWT as 'high-energy ESWT' is not correct and should be abandoned.
9	There is no scientific evidence that a certain fESWT technology is superior to the other technologies.
10	An optimum treatment protocol for ESWT appears to be three treatment sessions at 1-week intervals, with 2000 impulses per session and the highest energy flux density that can be applied.