Extracorporeal Pulse Activation Therapy (EPAT)

Author:
Pavel Novak

Institution:
Storz Medical AG, Lohstampfestr. 8 CH-8274 Tägerwilen, Switzerland

Device and producing company:
Duolith SD1, Storz Medical AG

Introduction:
Within the last two decades the high energy shock waves used for stone disintegration proved their ability to stimulate healing processes in human tissue using much lower energy levels, especially in soft tissue pain management. Also the pulse characteristics changed when radial pressure wave systems were introduced.

Methods:
The excursion of different transmitters (D-Actor, V-Actor) has been measured with laser vibrometer and/or laser distance transducer.

Results:
The pressure waves generated with pneumatically driven hand pieces and their attached pulse transmitters are typically in the frequency range <10kHz resulting from the oscillation of the transmitter. Depending on the transmitter design and materials, there are also pressure waves in the frequency range of approximately 100-150kHz which are due to longitudinal vibrations within the transmitter's material.

Discussion:
None of the pressure waves generated by the pneumatically driven hand pieces exhibit typical physical characteristics of shock waves. Still, multiple clinical studies proved that for many soft tissue indications the healing effects achieved are comparable to the results achieved with shock waves. Thus the common, typical pulse form and not the shock wave characteristic might be responsible for the healing effect.

Conclusion: It should be accepted that shock wave characteristics are not the only source for multiple beneficial physiological effects. "Shock waves" applied for soft tissue treatments today have very low energy levels which have stimulating effects. There are no destruction effects (ESWL) and almost no negative side effects. Consequently, another term is suggested for more appropriate description and clear differentiation from (ESWT): "Extracorporeal Pulse Activation Therapy" (EPAT).