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EPAT for Trigger Points and Myofascial Conditions in Sport Medicine

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Introduction

EPAT (Extracorporal Pulse Activation Therapy) is used to describe the application of radial pressure waves, sometimes also referred to as radial shock waves. For the application of focused shockwave is the term ESWT most common. EPAT and ESWT can be used to treat the musculo-skeletal complex effectively. The application of focused shockwaves applied to muscle trigger points are used for diagnostic and therapeutic purposes according to Dr. Gleitz (1). Manual examination of trigger points in combination with EPAT can be used for diagnostic and therapeutic purposes with positive results. In our practice, EPAT is used for the local treatment of muscular trigger point areas, tendon insertion pain and for smoothing of the myofascial structures. EPAT allows large muscle regions to be treated effectively and in a timely manner. The focused shock waves induce a reduction of nociceptive fibers whereas radial pressure waves (EPAT) seem to have a counter-irritation and pain modulating effect through GABAergic interneurons in the dorsal horn (1). In addition to this action, the pressure and vibrations of radial shock waves (EPAT) improve blood circulation and lymphatic drainage.

EPAT application to muscle trigger points, tendon insertion pain and myo-fascial conditions represents an evolution of use within the musculo-skeletal system. In our practice therapy is applied with an EPAT system developed by Storz Medical AG. The mode of action is identical to that used by pneumatic jack-hammers: that is a ballistic source (air compressor) generates pressure waves by means of a projectile impacting a solid applicator in the hand piece. The applicator (D-Actor with 20 mm diameter) has to be covered with coupling gel and then fixed in tight contact with the skin. The pressure used to drive the projectile can be varied continuously from 1 bar to 4 bar using a dial on the front panel of the control unit (2).

In our practice muscle shortening or tightness can be a risk factor for tendinosis. Reducing the tension within the Musculo-Skeletal Complex can lead to a reduction in pain. A complete Functional Movement Screen (3) and Clinical Orthopaedic Examination (4) will be performed before an EPAT treatment is initiated.

1. The effectiveness of EPAT on the muscle belly might be given by the trigger point therapy theory established by Travell and Simons work (5). The presence of trigger points in muscles cause a significant motor dysfunction with the clinical findings of a restriction of full stretch motion, a palpable increase in muscle tenseness and painful contraction knots. The contracture of the actin-myosin filaments caused by trigger points, due to the energy crisis of the motor end-plate, leads to muscle contractures which result in a measurable overall shortening of the affected muscles and a limitation in joint range of motion.

2. The effectiveness of EPAT on the tendon insertion or the tenoperiosteal junction might be given by a transverse friction technique that was developed by Dr. James Cyriax (4). The scar tissue or thickening is broken up by counter pressure of the EPAT head with a sweeping motion moving in a transverse direction across the tendon.

3. The effectiveness of EPAT on the myofascial meridian system as described by Thomas W. Myers in Anatomy Trains (6) can be shown through the use of EPAT smoothing in the direction of connection. Once the particular patterns of these myofascial meridians are recognized and the connections understood, they can be applied in EPAT smoothing treatment.

The use of EPAT has also been shown to have promising results in improving local circulation (reactive hypermia) and reduce the concentration of vasoneuro-active substances within the generalized treatment area (2).

EPAT Treatment Guidelines of the Shoulder Musculo-Skeletal Complex:

The goal is to reduce muscle shortening in the musculo-skeletal complex

The driving pressure (bars) is adjusted to the patient's pain threshold

500-1000 Pulses Decreases TP within muscle belly or musclo-tendinous junction

1000-1500 Pulses Decreases insertion scar tissue or thickening

1000-2000 Pulses myofascial meridian smoothing

Therapy frequency of one session per 3-10 days has been shown to be ideal.

EPAT Suggested Treatment Areas for Shoulder Pain:

2.6 Bars or decrease to patient tolerance 500-1000 Shocks + TP in Supraspinatus/ Infraspinatus	 
2.6 Bars or patient tolerance 500-1500 Shocks + Supraspinatus, Supine Lying	
3.0 Bars or patient tolerance 500-1500 Shocks + Infraspinatus, prone lying	
2.6 Bars or patient tolerance 500-2000 Shocks + Myo-fascial Meridian Smoothing	**Typical Complete Treatment:** **2000-6000 Shocks @ ~11 Hz**

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