

New Technique in Tendon Sport Recovery. Percutaneous Electrolysis Intratissue (EPI®)

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Based on the literature and clinical experience we know that the technique of percutaneous electrolysis intratissue (EPI) has positive effects on the recovery of human tendinopathies. The application of the technique, together with the completion of eccentric exercise, give benefits leading to anatomical and functional recovery in the tendon that can be appreciated by ultrasound using the scale of "Victorian Institute of Sport Assessment-patellar tendon" (VISA-P). Due to clinical knowledge, damage to tendon is accompanied by increase in oxidative stress, cell death and inflammation at the damaged area. The EPI technique produced a galvanic current inside the tendon, with an acupuncture applicator, producing increase in cell death, inflammation and oxidative stress in the first days of treatment. After these days, the recovery of tendon is quickly and higher than without EPI technique used. Galvanic current is produced in a salad solution producing chemical reaction with salt decomposition (NaCl) and H₂O₂ in its chemical constituent elements. After they form new substances, such as NaOH, H₂ and Cl₂, they change the reactions inside the tendon damage. The NaOH has vital importance because it is high caustic and destroy collagen and mixed substances in tendon damage area. EPI is a basic technique giving a chemist process without boil electrocution of tissue. When EPI is used, an increase in inflammatory response of the tissue is also detected. In chronic tendon, with the unique possibility of recovery by surgery, EPI technique has recuperation of tendon without surgery. EPI technique, in European countries, has been used in the last decade with wonderfully results to recovery pathological tendons from athletes in competition. Furthermore, it is known that after recovery from injury in damaged area, neo-vascularization occurs. It is intent of tendon to obtain more energy to recover damage tissue.

Valles and its collaborators have demonstrated the molecular mechanism of action of EPI technique [1]. First of all, an increase in oxidative stress and inflammation occurs in the tendon chronic damage. After, we appreciate a neovascularization in the damage area with increase in inflammatory mediators. As we know in damage tendon, in first days of lesion, an increase in inflammation and vascularization are detected, but sometimes tendon recovery occurs with a non-excellent distribution of the tendon tissue. With the EPI technique, because the destruction produced by EPI and posterior redistribution of tendon damage, produce a more promptly recovery with a good new distribution of new tissue.

Studies with human have demonstrated the importance of this technique in sport population and also studies in rats [1,2] have shown an increase in apoptosis and necrosis, with increase in Cytochrome C and SMAC/diablo, demonstrating a special pathway to recover from the damage produced by EPI [3]. Interesting, has been demonstrated in cancer A431 cells that cholesterol depletion using metil-β-cyclodextrine cause apoptosis [4]; and in human queratinocytes disruption of lipid rafts by depletion of cholesterol compounds (metil-β-cyclodextrine, filipin III, colesterol oxidase or mevastatin) produce a rapid union of Fas inside lipid membranes, forming Fas-FADD complex, activation of caspase-8 and apoptosis [5]. We here want to appoint that after lesion and too destroy damage tissue or near tissue to damage tissue, a programed cell death occur inside the organism to permit the

elimination and regeneration in damage tissue. SMAC/diablo is a protein principally induced in programed apoptosis.

In the clinic, we detect an increase in local angiogenesis develop after application of EPI technique. In research with rats, we have demonstrated an increase in vascular endothelial growth factor (VEGF) and its receptor VEGFR-1 and 2, demonstrating an increase in neovascularization in the damage area. Also we detect, days after application of EPI technique an increase in PPAR-γ production, anti-inflammatory protein produced after inflammation occurs in damage tissues.

With all, we want to note here the importance of this technique in the future to recover damage tendon in sport population and in football players in particular.

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