

# **The effect of ESWT on matrix structure, tenocyte metabolism and gene expression in non-injured tendinous structures**

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## **Device and producing company:**

HMT Equitron, High Medical Technologies, Lengwil, Switzerland

## **Introduction:**

Although ESWT is frequently used for the treatment of tendinopathies, little is known about the mechanism of action and the actual effects on tendon tissue. In this study the effects of ESWT on non-injured equine tendon were investigated.

## **Methods:**

Different tendinous structures were exposed to ESWT in ponies either 6 weeks or 3 hours before euthanasia. The contralateral tendons were used as untreated controls. The tendons were analysed biochemically and histologically. Gene expression was determined using rtPCR and tenocyte metabolism was studied by the incorporation of radioactively labelled <sup>3</sup>H and <sup>35</sup>S in explants.

## **Results:**

There was a significant increase in GAG and protein metabolism 3 hours after ESWT, but after 6 weeks metabolic activity was decreased. Biochemically, the level of degraded collagen was increased 3 hours after treatment. Histologically disorganisation of the collagen network was apparent 3 hours after ESWT, which was less severe but still visible after 6 weeks. Gene expression levels of COL1 and MMP1 were elevated 6 weeks after ESWT.

**Discussion:** ESWT causes a transient stimulation of tendon metabolism and an upregulation of the expression of the major constituent COL1. Both factors might contribute to the healing process in injured tendons. The disorganisation of the collagen network and the increase in MMP expression appear less desirable, but could, however, be indicative for early matrix remodelling.

**Conclusion:** It is concluded that exposure of non-injured tendinous tissue to ESWT is not as un-eventful as expected and that exercise of recently treated patients should be limited to prevent tissue structure from being further affected.