INTRODUCTION

Clinically, it is well known that physical activity promotes tissue regeneration after injury. The exact mechanisms for this mechanobiological transduction are still largely unknown.

METHODOLOGY

Twenty-five male spontaneously hypertensive rats (265 g) were housed individually, and divided into three groups according to the degree of physical activity after tendon rupture. 1) Eight rats had access to a running wheel, permitting unlimited voluntary activity (Run-group). 2) Nine rats were housed without a running wheel but allowed free mobility (Mob-group). 3) Nine rats were cast immobilized on their operated leg with a padded plaster of Paris (Immobil-group).

RESULTS

The histologic examination of the healing tendons at week 4 demonstrated that increased physical activity was associated with a higher degree of maturation and regeneration of the connective tissue. The highest amount of organized collagen fibres was found in the running group, while the immobilized group exhibited the lowest amount. Moreover, the occurrence of inflammatory cells decreased with increased physical activity. The tendon diameters in the immobilized (1.62±0.64) and freely mobilized groups (2.1±0.79), respectively were 47.3% (p=0.001) and 32.0% (p=0.02) smaller than in the running group (3.1±0.48). (Fig. 2B).

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