Refixation of the supraspinatus tendon in a rat model--influence of continuous growth factor application on tendon structure.

The purpose was to evaluate histological changes of the supraspinatus tendon (SSP) after refixation under continuous growth factor application over 20 days in comparison to the native healing process. In a chronic rat tendon tear model (15 rats/group), a transosseous SSP refixation was performed and growth factors (control, G-CSF, b-FGF, combination) were continuously released into the subacromial space by an osmotic pump. Tendon healing was evaluated histologically by a modified MOVIN-Score, and Collagen I/III content was determined by immunohistology at 6 weeks. A modified MOVIN sum score showed significant lower counts for G-CSF and b-FGF in comparison to the control group (p = 0.050/p = 0.027) and the combined group (p = 0.050/p = 0.043). Collagen III was significantly reduced in the combined group compared to the control group (p = 0.028). Collagen I showed no significant differences. The Collagen I/III ratio was nearly doubled for b-FGF and the combined group compared to the control. At the study endpoint, 33% of pump dislocations were detected. The continuous application of both isolated growth factors (G-CSF/b-FGF) achieved improved tendon-remodeling. However, the continuous application via an osmotic pump was challenging.
pump showed a relative high dislocation rate when applied in the rat model.