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## Adipose-derived stem cells enhance primary tendon repair: Biomechanical and immunohistochemical evaluation.

Uysal CA, Tobita M, Hyakusoku H, Mizuno H.

Department of Plastic and Reconstructive Surgery, Baskent University Faculty of Medicine, Ankara, Turkey; Department of Plastic and Reconstructive Surgery, Nippon Medical School, Tokyo, Japan. Electronic address: cagriuyosal@hotmail.com.

### Abstract

**BACKGROUND:** Primary **tendon repair** aims at increased tensile strength at the time of mobilisation. **Tendon repair** and regeneration using mesenchymal **stem cells** have been described in different studies; however, **adipose-derived stem cell** (ASC) use for **tendon** regeneration and **repair** has recently been taken into consideration. In this study, we sought to determine whether ASCs would be beneficial in primary **tendon healing**.

**MATERIALS AND METHODS:** Both the Achilles **tendons** of rabbits (n = 6) were incised and consequently repaired. To the left side was applied platelet-rich plasma (PRP) gel and to the right side autologous ASC-mixed PRP. The tensile strength was measured on the 4th week. The samples were taken for immunohistochemical evaluation of collagen type I, transforming growth factor beta (TGF- $\beta$ ) 1, 2, 3, fibroblast growth factor (FGF) and vascular endothelial growth factor (VEGF).

**RESULTS:** The tensile strengths in control and experimental groups were found out to be  $29.46 \pm 3.66$  and  $43.06 \pm 3.80$  kgf. Collagen type I, FGF and VEGF levels were statistically higher, whereas TGF- $\beta$ 1, 2, 3 were lower in the experimental group.

**CONCLUSION:** ASCs enhance primary **tendon healing**; however, the complex interaction and the cascades by which ASCs could increase collagen type I, FGF and VEGF and decrease TGF- $\beta$  levels should further be investigated.

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