

A RADIOGRAPHIC AND HISTOLOGIC EVALUATION OF THE PATELLAR TENDON AFTER HARVESTING ITS CENTRAL THIRD

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Introduction: The aim of the study was to evaluate the radiographic and histologic appearance of the patellar tendon after its central third had been harvested as a graft for anterior cruciate ligament reconstruction.

Patients and Methods: Nineteen consecutive patients were included in the study. The age of the patients at the index operation was 27 (16-43) years and the operation was performed 12 (2-192) months after the index injury. Magnetic Resonance Imagings were performed 6 (5-10) weeks, 6 (6-8) months and 27 (24-29) months after the index operation. Ultra-Sonography examinations and obtaining of biopsies were performed 27 (24-29) months after the index operation. Normal control tissue from the patellar tendon of 11 age matched patients, was obtained, at the time of an anterior cruciate ligament reconstruction. Informed consent and permission from the Ethics committee of the University of Göteborg were routinely gained. Non-parametric statistical tests were used.

Results: At the follow-up the Tegner activity level, Lysholm score, International Knee Documentation Committee (IKDC) evaluation system and one-leg-hop-test revealed a significant improvement as compared with the preoperative values. The serial Magnetic Resonance Imagings revealed that the donor-site gap (area corresponding to non-tendinous-like tissue signal) decreased with time during the study period. Both the thickness and the width were significantly increased ($p < 0.01$) compared with the non-harvested contralateral patellar tendon regardless of when the Magnetic Resonance Imagings were done. Ultra-Sonography examinations at 27 months after the harvesting procedure revealed that the thickness of the patellar tendon of the donor-site was significantly ($p < 0.001$)

increased as compared with the non-harvested contralateral patellar tendon. Histologic evaluation of the repair tissue in the central part of the tendon, as well as the tissue in the peripheral part of the patellar tendon of the donor-site showed significantly increased ($p < 0.01$) cellularity and vascularity, as compared with normal control tendon. Both the cellularity ($p < 0.01$) and the vascularity ($p < 0.001$) were significantly increased in the biopsies obtained from the central repair tissue, as compared with peripheral part of the patellar tendon of the donor-site.

We did, however, not find any major abnormality in the fiber structure in most patients neither in the central nor in the peripheral part of the patellar tendon of the donor-site. Likewise, no increase was registered in the content of glucosaminoglycans (GAGs) or the amount of collagen type III. The absence of GAGs in the biopsies of the present study suggests, that other factors than retained water contributed to the increased cross-sectional area of the patellar tendon. Our inability to demonstrate increased amounts of collagen type III, in the central as well as the peripheral part of the patellar tendon indicates that there was no early collagen synthesis present 27 months after the harvest procedure.

Conclusion: Serial Magnetic Resonance Imagings revealed that the donor-site gap filled with tendinous-like tissue with time. The patellar tendon, 27 months after the harvesting procedure, showed significant radiographic abnormalities, i. e. increased thickness and width. The histological correlate to these findings included an increased cellularity and vascularity in the central repair tissue as well as the peripheral part of the tendon.

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