

ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION SURGERY

Aspects of graft choice, graft fixation
and bone mineral loss

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AVHANDLINGEN BASERAS PÅ FÖLJANDE DELARBETEN:

- I. **Bone mineral assessments in the calcaneus after anterior cruciate ligament injury. An investigation of 92 male patients before and two years after reconstruction or revision surgery.**
Kartus J, Stener S, Nilsén R, Nilsson U, Eriksson BI, Karlsson J
Scand J Med Sci Sports. 1998;8(6):449-455
- II. **Ipsi- or contralateral patellar tendon graft in anterior cruciate ligament revision surgery. A comparison of two methods.**
Kartus J, Stener S, Lindahl S, Eriksson BI, Karlsson J
Am J Sports Med. 1998;26(4):499-504
- III. **A long-term, prospective, randomized study comparing biodegradable and metal interference screws in anterior cruciate ligament reconstruction surgery: radiographic results and clinical outcome.**
Stener S, Ejerhed L, Sernert N, Laxdal G, Rostgård-Christensen L, Kartus J
Am J Sports Med. 2010;38(8):1598-1605
- IV. **The reharvested patellar tendon has the potential for ligamentization when used for ACL revision surgery.**
Stener S, Ejerhed L, Sernert N, Movin T, Papadogiannakis N, Kartus J
Knee Surg Sports Traumatol Arthrosc 2012;20(6):1168-1174
- V. **Anterior cruciate ligament reconstruction reduces bone mineral areal mass.**
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ABSTRACT

The aim of this thesis was to measure bone mineral changes in the calcanei, hips and lumbar spine of patients reconstructed with bone-patellar tendon-bone (BPTB) or hamstring tendon (HT) autografts following anterior cruciate ligament (ACL) injury. Furthermore, the aim was to compare the clinical results after ACL revision reconstruction with either reharvested ipsilateral or contralateral BPTB autografts. A third aim was to compare bone-tunnel widening after ACL reconstruction using either bioabsorbable or metal interference screws. In Study I, bone mineral areal mass (BMA) was measured in the calcanei using the dual-energy photon absorptiometry (DPA) technique in 92 male patients scheduled for ACL reconstruction using BPTB autografts. The patients had a significantly lower BMA on the injured side compared with the uninjured side, before the reconstruction and two years after the reconstruction. A high level of activity correlated with the BMA on both the injured and the uninjured side two years after the reconstruction. In Study V, BMA was prospectively measured using the dual-energy X-ray absorptiometry (DEXA) technique in 67 patients scheduled for ACL reconstruction with HT autografts. After five years both female and male patients had lost more BMA in the calcanei and the hips compared with the age-dependent decrease in reference populations made up of normal healthy individuals. The BMA loss was not correlated with activity level, knee function scores or the health-related quality-of-life score EQ-5D. In Study III, 77 patients, scheduled for ACL reconstruction using HT autografts were randomised to poly-L-lactide acid (PLLA) or metallic screw fixation of the grafts. After eight years, the bone-tunnel widening was significantly larger on the femoral side but not on the tibial side in the PLLA group compared with the metal group. There were no differences in the clinical evaluation parameters between the two groups after eight years. In Study II, 24 patients underwent surgery using reharvested or primary harvested patellar tendon grafts in ACL revision reconstruction and they were assessed after two years in terms of their subjective and objective outcome, activity level and MRI findings relating to the patellar tendons. The patients who were given primary harvested, contralateral BPTB grafts had a significantly better outcome in the Lysholm knee score than the patients who were given reharvested BPTB grafts. Magnetic resonance imaging (MRI) findings were unable to detect any differences in the length, width, thickness or size of the residual gaps in the reharvested tendons compared with the primary harvested tendons. In Study IV, patients from the reharvested group returned for histological, radiographic and clinical evaluation three and ten years after the ACL revision reconstruction. Histological evaluation revealed that, after three years, the tendons showed signs of "ligamentisation" with an increased number of cells, capillaries and glycosaminoglycan content.

Keywords: Anterior cruciate ligament, Reconstruction, Revision, PLLA, Bone mineral areal mass, DEXA
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