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Autor(en) des Beitrags: Mayr, HO; Stoehr, A; Dietrich, M; von Eisenhart-Rothe, R; Hube, R; Senger, S; Suedkamp, NP; Bernstein, A

Titel des Beitrags: Graft-dependent differences in the ligamentization process of anterior cruciate ligament grafts in a sheep trial.

Abstract: The structural properties of the healing ligament are the determining factor for the stability of the reconstruction before, during, and after osseous integration of anterior cruciate ligament grafts. Over the course of ligamentization, the stability of synovialized grafts seems lower than that of non-synovialized patellar tendon grafts. In an animal study on 42 sheep, 21 non-synovialized grafts (patellar tendon) and 21 synovialized grafts (flexor digitorum superficialis tendon) were performed to replace the anterior cruciate ligament. After 6, 12, and 24 weeks, 7 animals from each group were euthanized and investigated. Anteroposterior stability of the knee was assessed. After removal of all other soft tissues, the ACL was loaded to failure. Histology and histological analysis of the intra-articular graft region was then performed. There were no significant differences in the translation test comparing synovialized and non-synovialized grafts. After 6, 12, and 24 weeks, all transplants failed in the tensile test due to interligamentous rupture or avulsion. After 6 weeks, transplants did not show significant biomechanical differences. Load to failure and stiffness of the patellar tendon was more than twice those of synovialized tendon (P = 0.002) after 12 weeks. Histology revealed necrosis in patellar tendon specimens after 12 weeks. A significant increase in load to failure was determined in
synovialized ligament grafts between 12 and 24 weeks (P = 0.005). Its load capacity then tended to be higher than that of patellar tendon grafts. The stability of synovialized ligament grafts is significantly lower than that of non-synovialized patellar tendon grafts after 12 weeks. This difference is compensated after 24 weeks. The significantly lower load to failure of synovialized compared with non-synovialized grafts after 12 weeks may be clinically relevant for the rehabilitation process of anterior cruciate ligament grafts in humans.