

## **Abstract**

**Aim:** This dissertation study was divided into two main topics, clinical trial and biomechanical experiment. The aim of clinical part was to evaluate and compare clinical outcomes after ACL reconstruction using two main types of autografts in woman patients. Eperimental part of the study was designed to investigate the effect of graft interaction with the fixation material on biomechanical properties of the graft.

**Methods:** In clinical part of the study 150 female patients after ACL reconstruction after 2 years postoperatively. Clinical results based on Tegner-Lysholm score, knee laxity and anterior knee pain were recorded for both groups and then compared. Experimental part of the study was designed to evaluate the biomechanical properties of hamstring grafts using load-to failure impaction testing using laser vibrometer. The effect of graft's structure damage on the biomechanical properties of the graft was tested.

**Results:** Tegner-Lysholm score improved in both observed groups, there was no significant difference in results between both groups at 2 years postoperatively. The experimantal part of the study supported the hypothesis that the biomechanical properties will be significantly affected by the interaction with the fixation device

**Conclusion:** Clinical results show no difference between the two main graft types in ACL reconstruction. Experimental testing indicates significant effect of graft damage during implantation on the biomechanical properties of the graft.