

Anatomic ACL reconstruction with quadriceps tendon graft resulted in equivalent knee laxity compared to hamstring tendon graft

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Introduction

The right choice of graft in **anterior cruciate ligament (ACL) reconstruction** is still under discussion.

The **hamstrings** (ST) are currently the most utilized grafts for primary ACL reconstruction in Europe, showing good results regarding revision rates, stability and patient related outcome.

Recently, there has been an increase in interest in the **quadriceps tendon** (QT) as an alternative autologous graft option for primary ACL reconstruction. This graft shows morphologic and biomechanical characteristics to produce a suitable graft for ACL reconstruction.

One benefit of the QT graft is the possibility of a **femoral press-fit fixation**. The advantage of this fixation technique is the circumferential bone to bone contact with better healing of the graft and that there is no need for a cost-intensive implant.

The purpose of the current study was to compare anterior laxity, rotatory stability and PROs after primary anatomical ACL reconstruction with either ST graft or autologous QT graft fixated in femoral press-fit technique. It was hypothesized that primary ACL reconstruction with a QT graft results in similar knee laxity and PROs compared to ST graft.



Material & Methods

- **Group I:** 25 patients receiving ST graft
- **Group II:** 25 patients receiving QT graft
- **Follow-up:** two years
- **Outcome Scores:** IKDC, KOOS, Lysholm, KT-1000

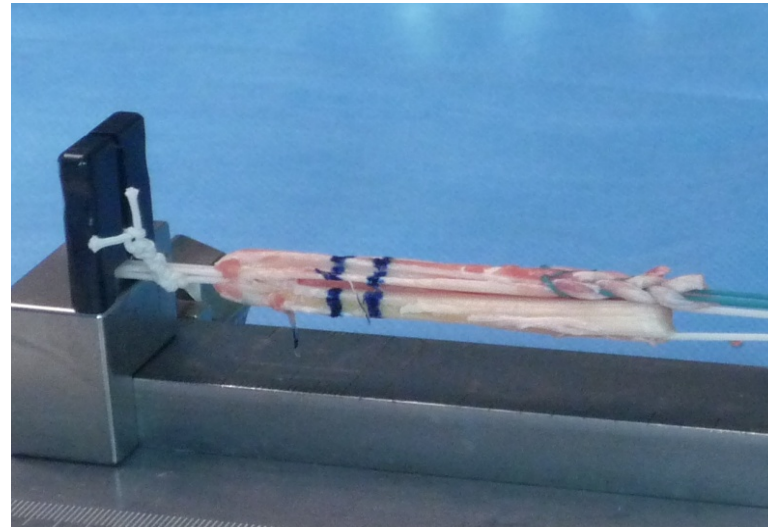
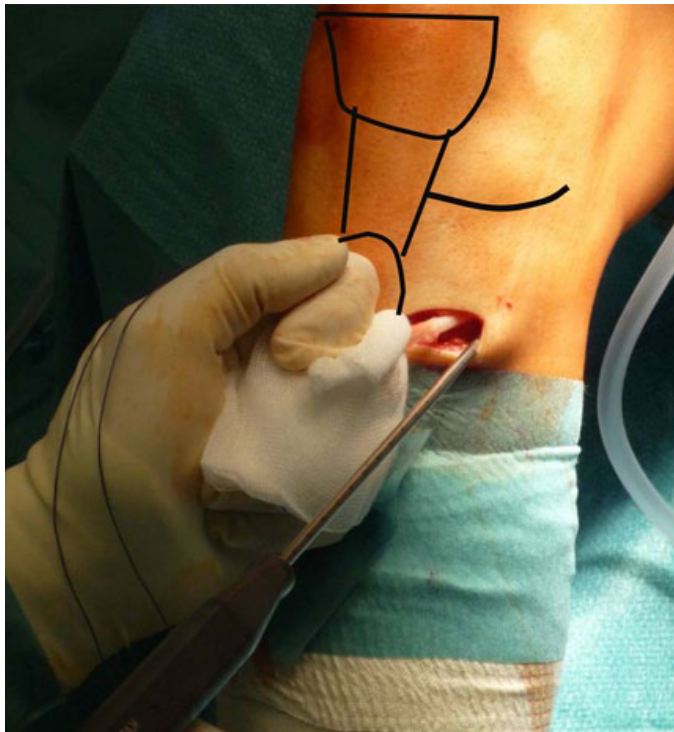
Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none">▪ Primary ACL rupture▪ Age >18 years	<ul style="list-style-type: none">▪ severe varus or valgus malalignment▪ additional ligamentous instability (MCL, LCL or PCL rupture)▪ transosseous meniscal repair▪ arthroscopy combined with HTO and/or slope correction▪ chondral lesion > grade II according to the outerbridge classification



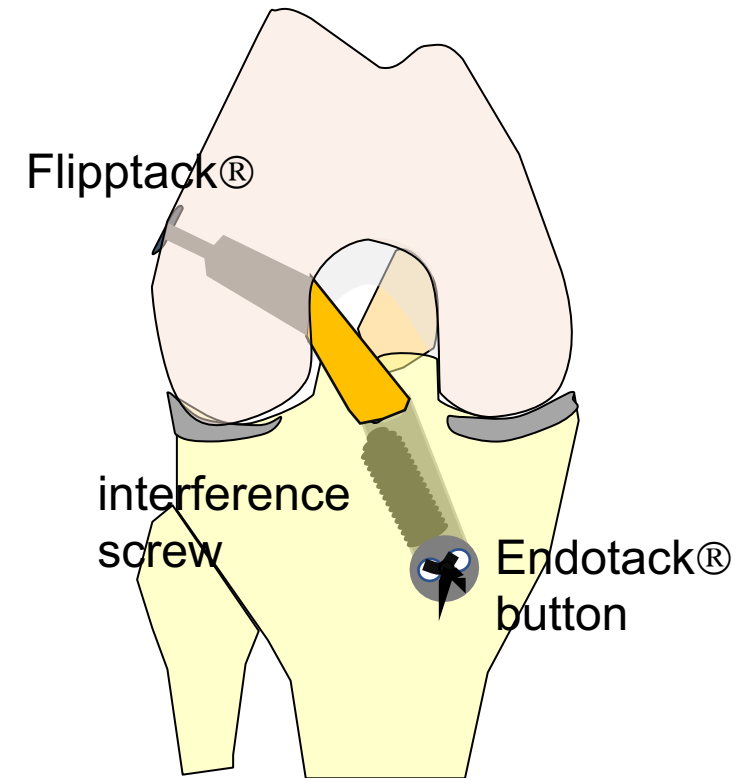


Surgical Technique – Hamstring Tendon

An oblique incision of about 3-5 cm medial to the tibial tuberosity was performed to harvest the semitendinosus tendon under the sartorius fascia with a tendon stripper (*Karl Storz, Tuttlingen, Germany*).



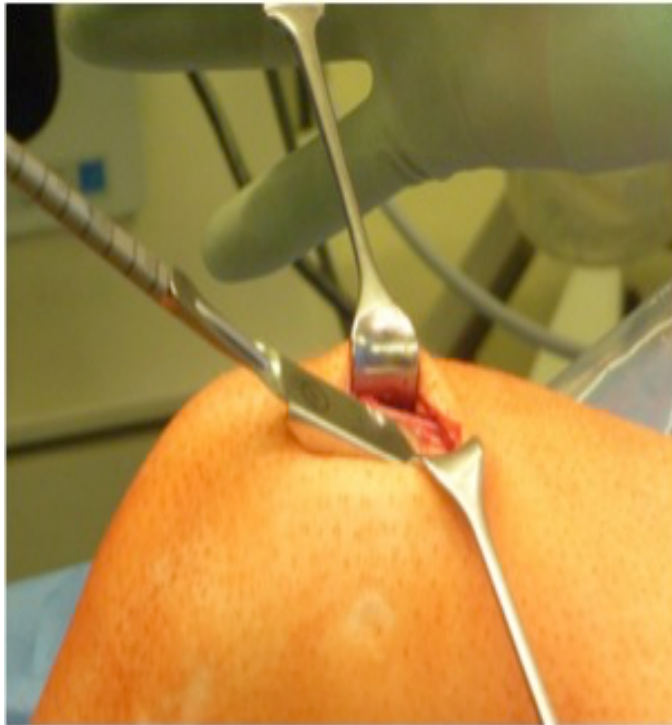
The graft was quadrupled and looped over a Flipptack® for femoral fixation respectively the other end secured with a baseball stitch and connected to an Endotack® button (*Karl Storz, Tuttlingen, Germany*).



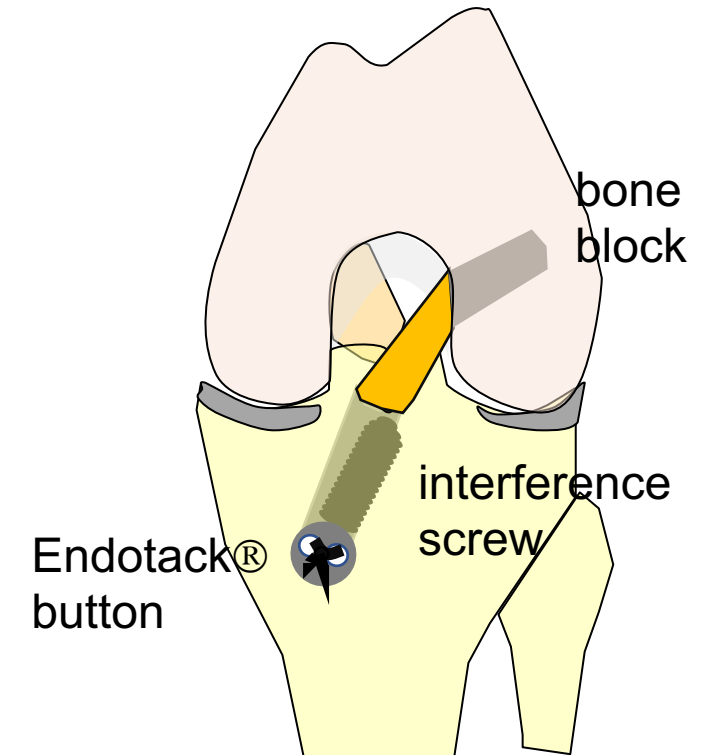


Surgical Technique – Quadriceps Tendon

A 4-5 cm longitudinal incision was performed to obtain the quadriceps tendon from the central with a double knife (*Karl Storz, Tuttlingen, Germany*).



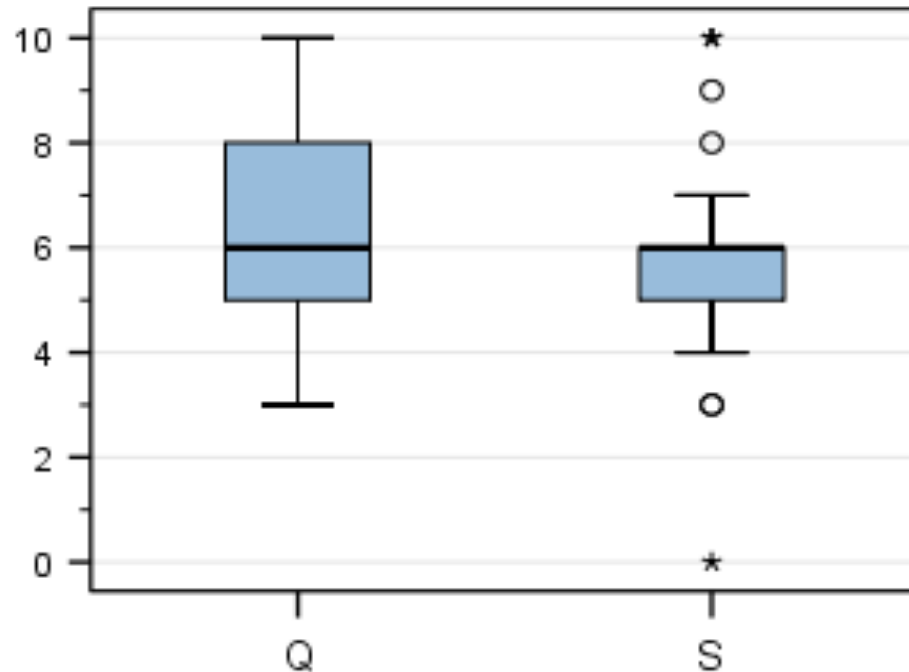
The length of the graft had to be at least 6,5 cm with a 1.5 cm bone block which was harvested with an oscillating saw and shaped in a conical manner.



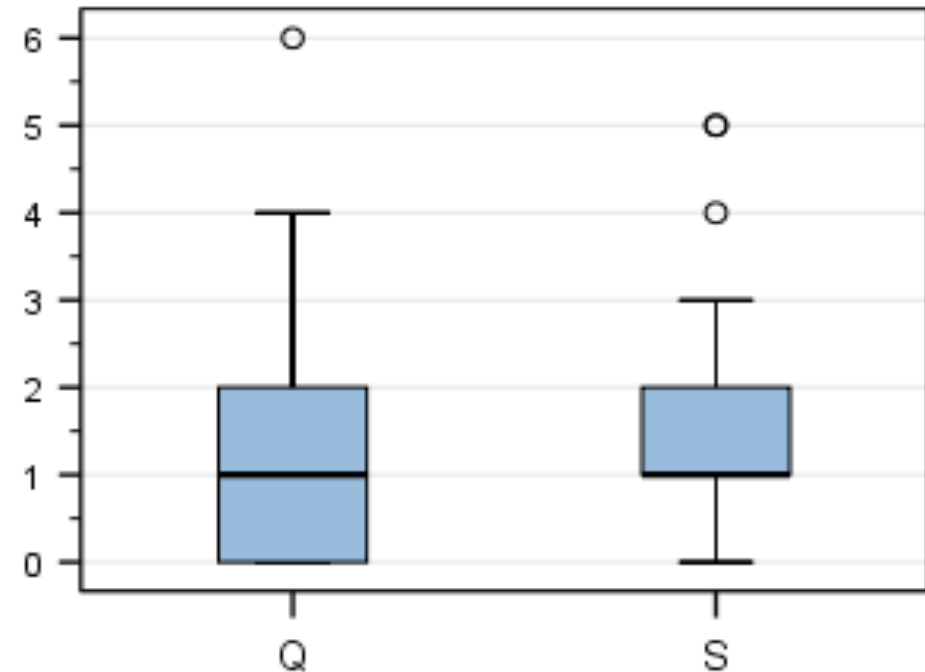


Results – KT 1000

KT difference preoperatively



KT difference postoperatively



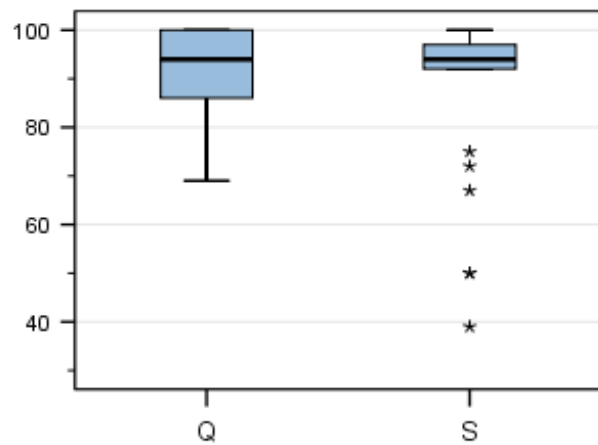
There was no significant difference in AP laxity between the two groups pre- (p=0.380) respectively postoperatively (p=0.694).



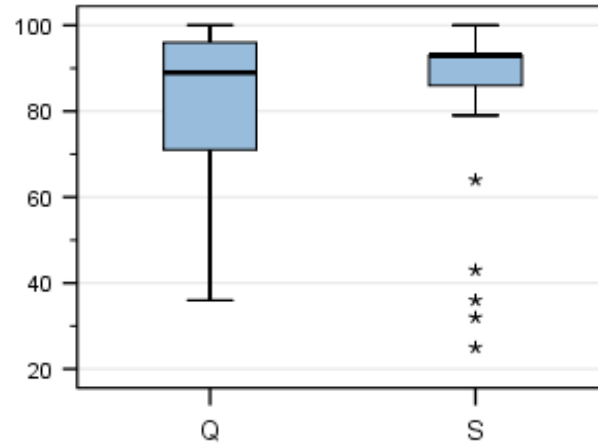
Q=Quadriceps tendon, S=Semitendinosus tendon graft



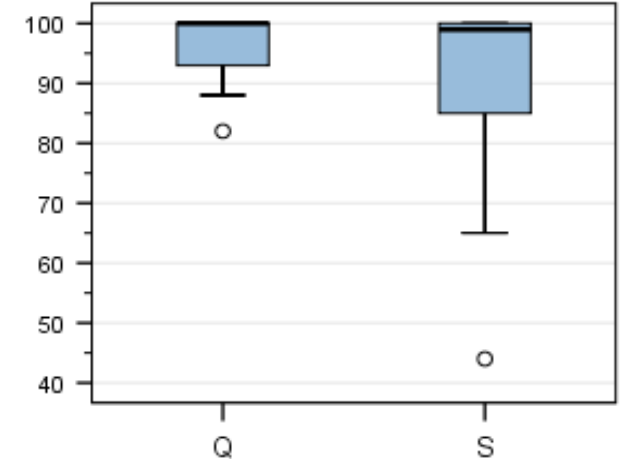
Results – KOOS



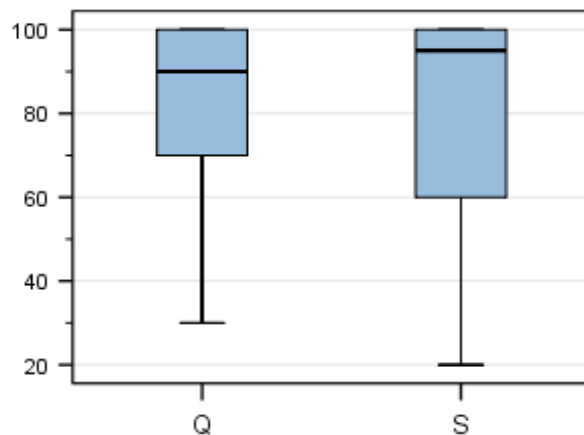
Pain



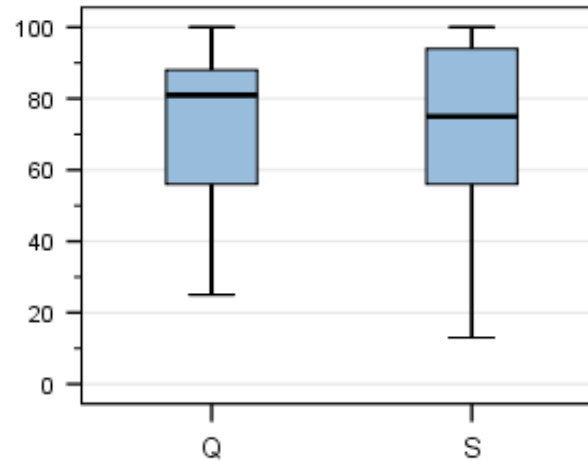
Symptoms



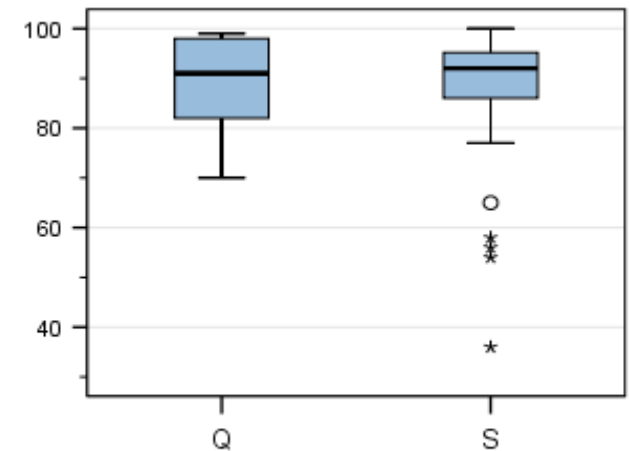
Activities of daily life



Sports



Quality of Life

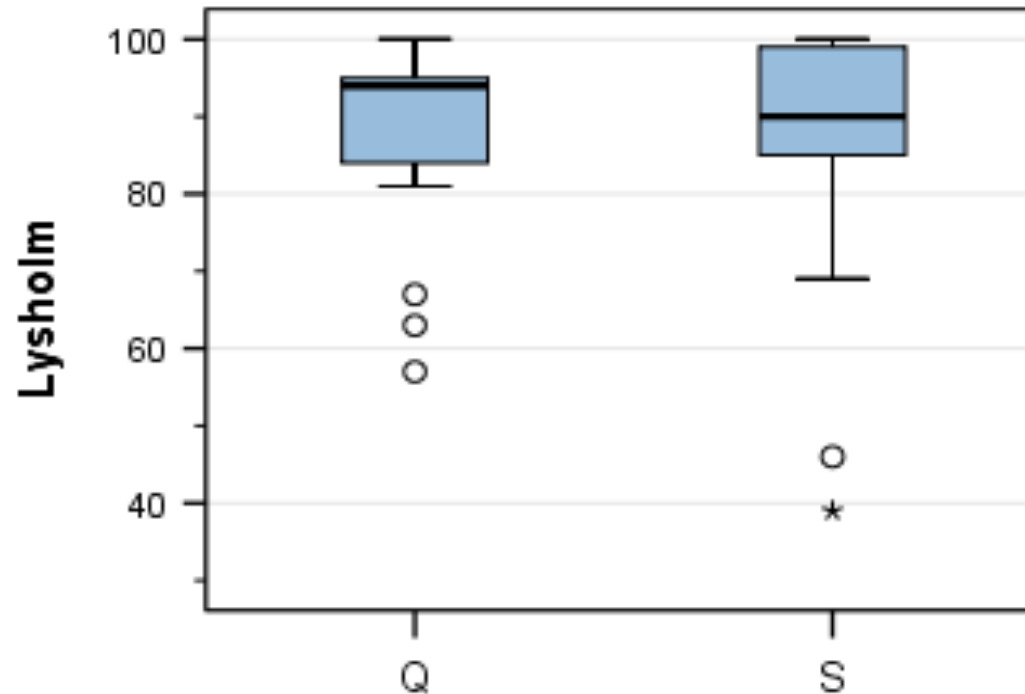


Total

 For the KOOS subscales, no significant difference could be detected between the Quadriceps- (Q) and Semitendinosus- (S) group ($p \geq 0.05$)



Results – Lysholm



There was no significant difference in the Lysholm score for the two treatment groups with an overall Lysholm score of 88.60 ± 11.78 for Quadriceps- (Q) and 86.28 ± 15.72 for Semitendinosus- (S) tendon after ACL reconstruction ($p=0.682$)





Conclusion

ACL reconstruction using the quadriceps tendon graft with an implant free femoral press-fit fixation showed good clinical outcomes similar to those of the ipsilateral semitendinosus graft in terms of knee laxity and patient reported outcome scores. Thus, the bone quadriceps tendon graft may be a good alternative for primary ACL reconstruction.



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