A randomized controlled study of Anterior Cruciate Ligament reconstruction with semitendinosus or semitendinosus and gracilis autograft: functional assessment 9 months after surgery

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Introduction

The main goal of Anterior Cruciate Ligament reconstruction (ACLR) is restoration of knee stability to enable return to the patients desired level of activity.

Choice of graft may affect both knee stability and time needed to return to sport after ACLR.
Hamstring autograft

The most common hamstring autograft technique is to harvest both the semitendinosus and gracilis tendons.

Less commonly, only the semitendinosus is used and the gracilis is spared (gracilis sparing technique).

There is paucity in the literature on whether this alternative method leads to less loss of muscle strength and function – and hence, accelerated rehabilitation and return to sport.

Sharma, 2016 & Ardern, 2009
Method

Ongoing prospective randomized trial (n = 108) comparing

1. «Standard» hamstring graft: Semitendinosus and gracilis
2. Gracilis sparing technique: Semitendinosus only

In this presentation, preliminary results on the functional outcomes nine months after surgery for the semitendinosus + gracilis group and the semitendinosus only group are presented.
Traditional hamstring technique harvesting semitendinosus and gracilis

Gracilis sparing technique harvesting semitendinosus only
Participants: Patients undergoing primary ACLR

Functional tests performed before and nine months after surgery

• Single legged hop tests (4 tests: 1 and 3 hop cm, 3 cross hops cm and 6 m timed hop sec)
• Isokinetic measurement of strength (peak torque)
Functional testing

Results presented as Leg Symmetry Index (LSI %): Involved/uninvolved x 100
Results

69 patients, 40 men (58%), mean age 33.7 (SD ± 10.1, Range 17-53) were included in this preliminary analysis.

The two groups did not differ demographically.
There were no significant differences in hop performance (p=.45) or isokinetic flexion strength (p=.76) before surgery, and there were no significant differences in hop performance (p=.26) or isokinetic flexion strength (p=.76) nine months after surgery.
Discussion

As m. Gracilis is mainly a hip adductor, can we expect preservation of knee flexion strength by sparing this tendon? Few randomized controlled trials examine this. There might be an effect for athletes who perform sports that involves deep flexion angles in the knee, i.e. gymnastics and judo. This is not sufficiently explored.

Existing strength testing protocols are probably not designed to assess potential effect of sparing the gracilis tendon as peak torque is achieved in more shallow knee angles. Here, the gracilis tendon is probably not much activated.

Sharma, 2016 & Ardern, 2009
Conclusion

These preliminary results indicate that patients who undergo gracilis sparing technique have equal, but not better function nine months after surgery.

Even though no differences were found between the groups, peak torque may have limitations when it comes to measuring strength and function of the semitendinosus and gracilis combined.
References

