

# Gender Differences After ACL Reconstruction with Hamstring Tendon Autograft.

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## INTRODUCTION

It is now well documented that females are more likely to suffer an ACL injury than males. A few studies have examined gender difference in the outcome of anterior cruciate ligament reconstruction with patellar tendon graft but no well controlled studies have specifically compared males and females after ACL reconstruction with hamstring tendon graft and interference screw fixation.

## METHODOLOGY

100 males and 100 females underwent isolated anterior cruciate ligament reconstruction by a single surgeon. Patients were assessed 1, 2 and 7 years after surgery. Variables were compared between female and male patients.

The endoscopic technique and femoral tunnel placement for ACL reconstruction was identical, having been performed by the same surgeon. There was no significant difference between the two groups on any of the following criteria:

- meniscal injury or treatment
- chronicity of injury
- articular surface damage
- medial ligament damage
- graft or tunnel size

Patients were reviewed at 6, 12 and 24, 60 and 84 months following surgery with IKDC Knee Ligament Evaluation Form, KT1000 Instrumented Knee Testing, Lysholm Knee Score and radiographs at 2 and 7 years.

## RESULTS

Laxity on physical evaluation was greater in females than males on Lachman ( $p=0.04$ ), Pivot shift ( $p=0.05$ ) and mean manual maximum testing ( $p=0.05$ ) at 7 years. However the magnitude of this difference was small. No patient had a greater than grade 1 Lachman or Pivot shift test and the mean difference between males and females was 0.6mm.

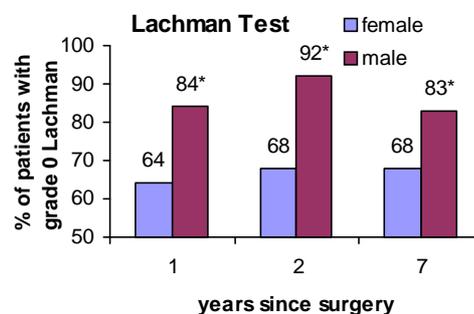
There was no difference between males and females for self reported knee function or symptoms of instability with activity. Significantly more male than female patients had loss of extension at 2 years ( $p=0.03$ ), but no difference was found at 7 years ( $p=0.30$ ). There was no significant difference between males and females in the percentage of patients with an abnormal radiological examination at either 2 or 7 years.

ACL graft rupture occurred in 11 males and 10 females. In addition there were 4 females (4%) and 8 males (8%) who suffered a contralateral ACL injury, including one male patient who suffered both an ACL graft rupture and a contralateral ACL injury. Thus after ACL reconstruction a total of 14 of 100 females and 19 of 100

## RESULTS (CONT)

males had a repeat ACL injury over the seven year follow-up period ( $p=0.33$ ). The annual incidence of ACL injury in the normal healthy population is reported to be between 1.5 and 1.7% per year. While no significant difference between males and females was found, the incidence of repeat ACL injury in males may be slightly higher than females and the normal active population.

	Female	Male
No of patients	70	73
Subjective Knee Function norm or nearly norm (%)	97	98
Overall IKDC norm or nearly norm (%)	86	89
Lachman Grade 0 (%)	68	83*
Pivot Shift Grade 0 (%)	80	92*
KT 1000 – manual max mean (mm) <3mm (%)	1.9 66	1.3* 79



## CONCLUSION

Anterior cruciate ligament reconstruction using hamstring tendon autograft affords excellent self reported and objective results in both males and females after 7 years. Although significantly greater laxity on physical examination is present in female patients than males, the magnitude of this difference was small and had no effect on activity level, graft failure, subjective or functional assessment. The reason for the increased laxity seen in females is unclear. Regression analysis did not find graft size to be a predictor of laxity determined by Lachman, pivot shift or KT1000 testing. It may be associated with the clinical observation of poorer interference screw tibial fixation in diminished bone stock (see Hill et al study).