

Outcome of Juvenile Anterior Cruciate Ligament Reconstruction using Parental Hamstring Allograft

Koushik Ghosh, MSc, MBBS
 Lucy Salmon PhD
 Emma Heath, MPhy
 Leo Pinczewski, MBBS FRACS
 Justin P Roe, MBBS FRACS

Accepted for presentation at :

- AANA Specialty Day New Orleans 2014
- APKASS Congress, Nara Japan 2014
- ISAKOS Biennial Conference, Lyon France 2015
- International Olympic Committee, Geneva, Switzerland, 2017
- Combined Orthopaedic Knee Societies Meeting of Australia, Britain, New Zealand and South Africa, October 2017 Noosa, QLD.
- International Society of Orthopaedic Centres, Sydney 2017
- American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, March 2018

Published

Knee Surgery Sports Traumatology and Arthroscopy January 2020



NORTH SYDNEY ORTHOPAEDIC & SPORTS MEDICINE CENTRE

Introduction:

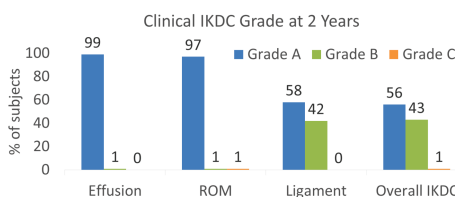
Anterior cruciate ligament (ACL) injuries are occurring with increasing frequency in juveniles, and is associated with higher rates of repeat injury after ACL reconstruction compared to adult cohorts. Over the long term the hazard for ACL graft rupture is 5 x greater in adolescent males and 2.5x greater in adolescent females compared with adults [1]. Use of a parental graft for ACL reconstruction has the theoretical advantages of allowing for a predictable graft diameter, minimizing donor site morbidity for the child, and preserving the neuromuscular structure of the child’s knee, all of which may have favorable effect on reducing repeat ACL injury and facilitate a full rehabilitation. Evidence supporting this technique is currently limited.

Methods:

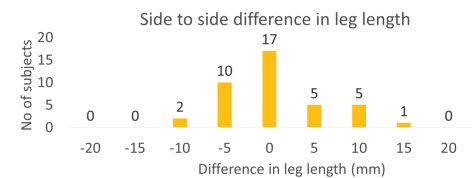
100 consecutive juveniles undergoing ACL reconstruction with a living parental hamstring allograft were recruited prospectively and reviewed 2 years after ACL reconstruction with IKDC Knee Ligament Evaluation, and KT1000 instrumented laxity testing. Skeletally immature participants obtained annual radiographs until skeletal maturity, and long leg alignment radiographs at 2 years. Radiographic Posterior tibial slope (PTS) was recorded.

Results:

Of the 100 subjects 96% were followed to 2 years. 69 were male, and the mean age of was 13 years at surgery (range 8-17). The hamstring was donated by father in 79% and mother in 21%. The mean HT graft diameter was 7.5mm (range 6-10mm).



At surgery 30 juveniles were graded Tanner 1 or 2, 21 were Tanner 3 and 49 were Tanner 4 or 5. There were no cases of iatrogenic physical injury or leg length discrepancy on long leg radiographs at 2 years, despite a mean increase in height of 8cm. Twelve patients had an ACL graft rupture and 9 had a contralateral ACL injury. Of those without further ACL injury, 82% returned to competitive sports, IKDC ligament evaluation was normal in 52% and nearly normal in 48%.



A radiographic PTS of 120 or more was observed in 49%.

Conclusions:

We report a high rate of return to sport in addition to excellent subjective and objective clinical outcomes at two years after ACL reconstruction with living donor hamstring allograft in a juvenile population. Further ACL injury to the reconstructed and the contralateral knee remains a significant risk, with identical prevalence observed between the reconstructed and contralateral ACL after 12 months.



FRIENDS OF THE MATER

This study was generously supported by the Friends of the Mater Foundation