

Endoscopic Transphyseal Anterior Cruciate Ligament Reconstruction in Children Using Live Donor Hamstring Tendon Allograft

Justin P. Roe, FRACS, AUSTRALIA

Martin Goddard, MBBS, MRCS Eng, UNITED KINGDOM

Nicholas Bowman, FRCS Tr&Orth, AUSTRALIA

Lucy J. Salmon, PhD, AUSTRALIA

Alison Waller, BAppSci(Physio), AUSTRALIA

Leo A. Pinczewski, FRACS, AUSTRALIA

North Sydney Orthopaedic & Sports Medicine Centre
Sydney, NSW, AUSTRALIA

Summary:

Endoscopic Transphyseal ACL reconstruction in children using living donor HT tendon allograft achieves excellent clinical and subjective outcomes with high levels of return to desired activities.

Abstract:

Introduction:

Treatment of anterior cruciate ligament (ACL) rupture in children remains controversial. ACL tears are being seen with increasing frequency in children. The purpose of this study was to determine the outcome of endoscopic transphyseal single tunnel ACL reconstruction using living donor hamstring tendon (HT) allograft.

Methods:

Between 2007 and 2008, 1168 ACL reconstructions were performed by 2 surgeons. Of these 32 children under 17 years underwent endoscopic transphyseal single tunnel ACL reconstruction using living donor HT allograft. HT allograft was harvested from a parent. At minimum 2 years follow up full IKDC knee ligament evaluation and examination was performed on the children including instrumented testing using the KT-1000 arthrometer. Donors underwent subjective review at minimum 2 years follow up.

Results:

Thirty one children (97%) were able to be contacted for review. Of these 2 (6%) sustained an ACL graft rupture within 2 years following surgery. Twenty nine children completed clinical and subjective review. The mean age at ACL reconstruction was 13 years (range 8-16). The mean HT graft size was 7.2mm (range 6-8). The mean IKDC subjective score was 97 (range 84-100). Twenty eight patients (97%) had a normal or nearly normal IKDC ligament grade. At 2 years after surgery 27 patients (93%) reported regularly participating in very strenuous or strenuous activities. There were no cases of limb malalignment. Twenty eight (97%) of the donors reported that they would undergo the same procedure again under the same circumstances.

Discussion and Conclusions:

Endoscopic transphyseal single tunnel ACL reconstruction using living donor hamstring tendon (HT) allograft achieves excellent clinical and subjective outcomes with high levels of return to desired activities. This technique allows more predictable size of the HT tendons compared with an autograft from the child, and maintains an intact neuromuscular hamstring structure in the child. Finally, the child's own HT tendons are reserved for future use. ACL reconstruction using living donor allograft should be considered a viable choice in children.