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Non-Irradiated Fresh Frozen Allografts for Anterior Cruciate Ligament Reconstruction in Young Active Patients

Justin P. Roe, FRACS, A/Prof., AUSTRALIA

Sarah Shumborski, MD, AUSTRALIA

Emma Heath, MPhty, AUSTRALIA

Lucy J. Salmon, PhD, AUSTRALIA

Leo A. Pinczewski, MBBS, FRACS, FAOA, AUSTRALIA

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

Summary:

Non-irradiated fresh frozen allografts perform comparably to hamstrings autografts at two years in terms of ACL graft rupture, and objective and subjective IKDC scores. Significantly increased rates of ACL graft rupture were seen when the allograft was obtained from a female donor over the age of 50 years, compared to male and younger female donors.

Abstract:

Background

There is a lack of robust evidence regarding outcomes of non-irradiated fresh-frozen allografts in young and active patients undergoing anterior cruciate ligament (ACL) reconstruction, and limited data on how the gender and age of the allograft donor can affect outcomes.

Methods

100 consecutive patients aged 16-25 years who had undergone ACL reconstruction with a non-irradiated fresh-frozen tendon allograft were identified from a prospective database. 2 year follow up including subjective and objective IKDC was performed. A comparative group of subjects who had undergone ACL reconstruction with hamstring tendon autograft were matched for age, gender and sport to the allograft subjects, to compare the incidence of ACL graft rupture. ACL graft reinjury rates were compared according to allograft characteristics, donor characteristics, and mode of preparation.

Results

ACL graft rupture occurred in 17% of the allograft group and 16% of the matched autograft group at two years. For the allograft group, mean IKDC scores were 91/100 and IKDC examination grades were A or B in 100%. Allografts from female donors over the age of 50 had significantly higher rate of ACL graft rupture compared with all other donor groups pooled (55% vs 12% at two years, $p = 0.001$). There was no difference in ACL graft rupture between grafts prepared in either alcohol or antibiotic solution.

Conclusion

When used for active patients aged 16-25 years, selected, non-irradiated, fresh frozen allografts perform comparably to hamstrings autografts at two years in terms of ACL graft rupture, and objective and subjective IKDC scores. The ideal allograft is should not be sourced from a female donor over the age of 50 years. Graft preparation in alcohol

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based or antibiotic based solution does not affect two year rate of ACL graft rupture.