

ACL Reconstruction with Allograft Versus Autograft in Patients 25 Years Old and Younger

Mark Wood MD, Robert Greer, Morgan Woods and Lyndon Wood

Introduction: The purpose of this study was to compare failure rates, patient-reported outcomes and the ability to return to sport in patients younger than 25yo following anterior cruciate ligament (ACL) reconstructions using either allograft (aseptic, nonirradiated) or autograft (hamstring and bone patella tendon bone).

Methods: A consecutive series of 130 patients 25 years or younger (range 12yo to 25 yo) with average age of 17 years, 1 month undergoing primary ACL reconstruction by the senior author (MLW) with either a patient/parent-selected nonirradiated allograft or autograft (quadruple hamstring or BPTB autograft) were retrospectively reviewed. All allografts were from a single source and aseptically processed without irradiation. The same rehabilitation protocols were used in all patients. The primary outcome measures were graft failure (defined by patient reported re-tear and/or a subsequent ACL revision surgery) and patient reported outcomes including the International Knee Documentation Committee (IKDC) subjective functional score questionnaire and the ability to return to pre-injury sport or activity.

Results: 78 patients with 82 ACL reconstructions, 57 allografts and 25 autografts, were available for follow-up at an average of 4year, 1 month and 3year, 6months, respectively. There were 47

female and 35 male procedures. 6 failures were identified: 3 allografts (5.26%) and 3 autografts (12.0%). 93% of allograft patients and 94% of autograft patients were able to return to pre-injury or strenuous sport/activity levels and 89% of allograft patients and 88% of autograft patients were able to return to pre-injury sport/activity level. IKDC scores were 84 for allograft patients and 87 for autograft patients post-operatively.

Discussion: Published reports confirm that younger patients have higher failure rates than adults after ACL reconstruction with overall autograft re-tear rates of 9% and as high as 15 – 20% in high risk populations such as adolescents and female soccer players. Numerous studies have confirmed no difference in failure rates and outcomes data between autografts and nonirradiated allografts in patients older than age 25. There is very limited clinical outcomes data published on nonirradiated allografts for ACL reconstruction in younger, active patients and allografts have not been commonly used due to the concern for a potential higher failure rate when compared to autografts.

Allografts prepared with harsh chemicals and irradiation are known to have increased re-tear rates compared to nonirradiated grafts and the majority of prior published studies do not stratify irradiated versus nonirradiated allografts in their outcomes. In this series of patients under age 25 years old (12yo – 25yo), a patient/parent-choice graft selection program with appropriate education and counseling (including standard postoperative rehab protocols) confirms that nonirradiated allografts for primary ACL reconstruction have low failure rates (5.2%) compared to autografts (12.0% in this series and published rates of 9%-20%). Furthermore, nonirradiated allografts showed

favorable patient reported outcomes data for return to pre-injury sport/activity (allograft 89% and autograft 88% in this series, published autograft rate 44% - 57%) and subjective functional outcome scores (IKDC: allograft 84 and autograft 87 in this series, published autograft rate 86-91).

Conclusion: With appropriate education for parent/patient graft selection and post-operative rehabilitation protocols, nonirradiated Allografts for ACL reconstruction have comparable failure rates to autografts in young, active patients without the down-side morbidity and problems associated with the harvesting of autograft tissue from the kneecap or hamstrings. Allografts have the advantages of smaller incisions, less pain, less narcotic medication usage and earlier return of range of motion, function and activities of daily living.