No Association Between Donor Tissue Variables and Clinically Significant Outcomes, Reoperations, and Failures Following Meniscal Allograft Transplantation

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INTRODUCTION:

Donor-recipient sex mismatch has been associated with adverse outcomes in various tissue and organ transplants. This study aimed to determine whether sex mismatch between donor and recipient affects clinical outcomes, reoperation, or failure rates following primary meniscal allograft transplantation (MAT). We hypothesized that sex mismatch would negatively impact clinically significant outcomes and graft survival.

METHODS:

Patients who underwent primary MAT between 2003 and 2022 with a minimum of 2 years follow-up were identified from a prospectively maintained database. Demographic data, donor age and sex, and graft expiration date were collected. Reoperations and failures were recorded. Reoperation was defined as any surgical procedure involving the allograft, including second-look arthroscopy, meniscectomy, or meniscus repair. Failure was defined as revision MAT or conversion to unicompartmental/total knee arthroplasty. Patients were assessed for achievement of clinically significant improvement using the International Knee Documentation Committee (IKDC) score at 5 years. Kaplan-Meier analysis evaluated graft survival, and log-rank testing compared survivorship between sex-matched and mismatched groups.

RESULTS:

A total of 245 patients (mean follow-up: 8.4 ± 4.2 years, range 2.0–19.1) met inclusion criteria. Isolated MAT was performed in 30% of cases. A significantly higher proportion of females (69%) received a graft from the opposite sex compared to males (8%) ($p < 0.001$). Recipients in the sex-mismatched group were younger on average (25.4 ± 8.5 vs. 28.6 ± 8.8; $p = 0.004$). Donor sex, age, and sex mismatch were not predictive of achieving clinically significant IKDC outcomes. No differences were observed in graft survival free from reoperation or failure.

DISCUSSION AND CONCLUSION:

Donor-recipient sex mismatch and other donor variables do not negatively affect clinical outcomes following MAT. These findings suggest that using grafts from donors of the opposite sex is safe and effective, which could help increase allograft availability and shorten wait times.