

# Comparable Clinical Outcomes and Graft Integrity in ACL Reconstruction for Patients Aged Over 50: A Propensity Score-Matched Analysis

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## INTRODUCTION:

Anterior cruciate ligament reconstruction (ACLR) is currently considered the standard treatment for ACL injury. The patient population for this surgery primarily consists of young individuals with high levels of sports activity. With the current increase in average life expectancy and overall improvement in health, there is a growing number of individuals over 50 years old actively engaging in sports activities. Additionally, many individuals in this age group are participating in high-risk pivoting activities such as skiing or soccer. However, there is still limited discussion regarding the clinical outcomes of ACL reconstruction in the middle-aged patient population over 50 years old.

## METHODS:

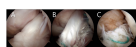
This study included Single bundle ACLR (SB-ACLR) patients who were followed up for more than two years from 2010 to 2022. Using factors such as sex, BMI, pre-injury Tegner level ( $\geq 6$  or  $< 6$ ), interval from injury to ACLR (whether more than 3 months), and graft type (autograft or allograft), 1:1 propensity score matching was performed between patients over 50 years old (Group A) and those under 50 years old (Group B). Failure was defined as the substantial loss of the graft confirmed by MRI or second-look arthroscopic examination. The range of motion (ROM), Lachman test, and Pivot shift test were compared between preoperative and postoperative physical examinations. Clinical outcomes such as Lysholm, Tegner, International Knee Documentation Committee (IKDC) subjective, and Knee injury and Osteoarthritis Outcome Score (KOOS) were compared between the two groups. The graft status was compared using MRI and second-look arthroscopy.

## RESULTS:

A total of 50 pairs were identified through 1:1 propensity score matching. There was no significant difference in the mean follow-up period between Group A ( $36.0 \pm 22.1$  months) and Group B ( $33.5 \pm 11.6$  months). ( $P=0.480$ ) In Group A, a total of 2 cases of graft failure were confirmed, while in Group B, 2 cases of graft failure and 1 case of surgical treatment-requiring meniscus re-tear was identified. No significant differences were found between the two groups in terms of preoperative and postoperative range of motion, Lachman test, and Pivot shift test results. Significant improvements were observed postoperatively in both groups in terms of Lysholm, IKDC subjective, Tegner, and KOOS when compared to preoperative values. Postoperatively, a significant difference was observed in the KOOS sports score between Group A ( $74.6 \pm 17.0$ ) and Group B ( $81.9 \pm 13.4$ ) ( $P=0.037$ ), and a significant difference was also noted in the IKDC subjective score between Group A ( $78.8 \pm 13.1$ ) and Group B ( $84.7 \pm 11.4$ ) ( $P=0.022$ ). Follow-up MRI was conducted for 44 patients in both groups, while second-look arthroscopy was performed for 26 patients in Group A and 34 patients in Group B ( $P=0.730$ ). Follow-up MRI imaging was performed at  $15.1 \pm 20.3$  months for Group A and  $12.2 \pm 13.6$  months for Group B ( $P=0.471$ ). There was no significant difference observed in the graft status between Group A and Group B as assessed by MRI ( $P=0.114$ ) and second-look arthroscopy ( $P=0.397$ ) after surgery.

## DISCUSSION AND CONCLUSION:

Compared to patients under 50 years old, SB ACLR in patients over 50 years old yielded favorable clinical and structural outcomes. Furthermore, when comparing patients over 50 years old with those under 50 years old, similar failure rates were observed.



	Group A	Group B	P value
Age	51.2 ± 2.1	50.8 ± 2.1	0.840
Sex	15 (30)	15 (30)	1.000
BMI	23.1 ± 1.2	23.1 ± 1.2	0.999
Tegner	5.8 ± 0.5	5.8 ± 0.5	0.999
Interval	18.1 ± 1.1	18.1 ± 1.1	0.999
Graft type	15 (30)	15 (30)	1.000
Follow-up	36.0 ± 22.1	33.5 ± 11.6	0.480

	Group A	Group B	P value
ROM	110.0 ± 5.0	110.0 ± 5.0	0.999
Lachman	1.0 ± 0.0	1.0 ± 0.0	0.999
Pivot shift	1.0 ± 0.0	1.0 ± 0.0	0.999

	Group A	Group B	P value
Lysholm	74.6 ± 17.0	81.9 ± 13.4	0.037
Tegner	5.8 ± 0.5	5.8 ± 0.5	0.999
IKDC subjective	78.8 ± 13.1	84.7 ± 11.4	0.022
KOOS	74.6 ± 17.0	81.9 ± 13.4	0.037

	Group A	Group B	P value
Follow-up MRI	44 (88)	44 (88)	0.730
Second-look arthroscopy	26 (52)	34 (68)	0.730

	Group A	Group B	P value
Follow-up MRI	44 (88)	44 (88)	0.730
Second-look arthroscopy	26 (52)	34 (68)	0.730

