The long-term outcome of ACL injury: 32 to 37 year follow-up

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Objectives

The state of the ACL injured knee and how this impacts on quality of life (QOL) more than 30 years after ACL injury, remains unclear. Additionally, the impact of surgical or non-surgical ACL treatment on outcome beyond 30 years of injury is uncertain. This study aimed to:

i. Evaluate patient-reported outcomes (PROs) 32-37 years following acute ACL injury

ii. Assess whether ACL treatment (surgical or non-surgical), baseline meniscus injury and knee function at mid-term follow-up were related to differences in PROs at 32-37 year follow-up

Methods

From 1980 to 1985, 293 patients who ruptured their ACL <14 days previously were allocated to early surgical or non-surgical ACL treatment based on an odd or even birth year. ACL surgery (augmented or non-augmented repair) was performed within 24 (mean 5±4) days of injury. Concomitant injuries were diagnosed arthroscopically in all patients within 21 days of injury. A mid-term follow-up assessment was performed, on average 4±1 (range 3-7) years after injury. At long-term follow-up, all patients aged 16-40 years at the time of injury were invited to complete the Knee Injury and Osteoarthritis Outcome Score (KOOS), ACL-QOL and EQ-5D. We used Mann-Whitney U tests to compare outcomes between sub-groups. To detect clinically meaningful differences in the KOOS (>9-point difference), we required n=32 in each sub-group.

Results

225 patients were eligible for 32-37 year follow-up. To date, 173 (77%) have completed questionnaires (age 59±6 years, 28% female). 98 patients (57%) had initial non-surgical treatment of the ACL and 64 patients (37%) had not had ACL surgery at follow-up. 59% had baseline meniscus injury. There were no differences ($p>0.10$) in outcomes between patients initially treated with surgery vs. no surgery: KOOS-Symptoms (median(IQR)) 70(54, 86) vs. 75(54, 89); KOOS-Pain, 84(64, 97) vs. 86(63, 97); KOOS-Sport/Rec, 50(28, 85) vs. 53(25, 75); KOOS-QOL, 56(38, 64) vs. 56(44, 69); ACL-QOL, 72(50, 91) vs. 68(47, 87); EQ-5D 0.80(0.76, 1.00) vs. 0.80(0.73, 1.00).

There were no differences in outcomes between patients who had and hadn't received ACL surgery at long-term follow-up ($p>0.34$), and in those with and without baseline meniscus injury ($p \geq 0.10$). Limb symmetry index (LSI) ≤90% for quadriceps or hamstring strength at mid-term follow-up was not associated with long-term PROs ($p>0.11$). Patients with one-leg hop for distance LSI <90% at mid-term follow-up reported worse KOOS Pain (64(50, 90) vs. 86(67, 97) $p=0.01$) and ACL-QOL scores (41(34, 74) vs. 73(53, 90) $p=0.002$) 32-37 years after ACL injury.

Conclusions

ACL treatment (surgical or non-surgical) and baseline meniscus injury was not associated with long-term PROs. One-leg hop for distance LSI <90% at 3-7 year follow-up was associated with more pain and worse QOL 32-37 years after ACL injury.