Anterior Cruciate Ligament Reconstruction: Effect of age on early to mid-term clinical outcomes

O. Mann [1], O. Al-Dadah [2, 3]

[1]The Medical School, Newcastle University, Newcastle-upon-Tyne, UK
[2]Department of Trauma and Orthopaedic Surgery, South Tyneside District Hospital, South Shields, UK
[3]Translational and Clinical Research Institute, Faculty of Medical Sciences, Newcastle University, Newcastle-upon-Tyne, UK

Introduction

Anterior cruciate ligament (ACL) rupture is a debilitating condition and often requires surgery to restore joint stability. Patient reported outcome measures (PROMs) can be used to assess knee function following ACL reconstruction. Outcomes from this type of surgery are thought to be influenced by demographic factors such as age.

Aims

Evaluate the influence of age on early to mid-term clinical outcomes following ACL reconstruction.

Methodology

Six validated PROMs were collected before and after ACL reconstruction which included the Knee Injury and Osteoarthritis Outcome Score (KOOS) [1], International Knee Documentation Committee (IKDC) [2], Lysholm [3], Tegner [3], EQ-5D-5L [4], and Short Form 12-item Health Survey [5]. PROMs were compared between the Younger Group (<40 years) and the Older Group (≥40 years). The data was also analysed to assess for any correlations between age and post-operative PROMs.

Results

A total of 87 patients were included in the study with a mean post-operative follow-up of 2.3 years (range 1 to 7 years). Pre-operatively, the Younger Group (mean age 25 yrs [range 12 – 39]) had significantly better KOOS pain (p=0.007), KOOS ADL (p<0.001), KOOS overall (p=0.017), IKDC (p=0.005), Lysholm (p=0.015), Tegner (p<0.001) and SF-12 PCS (p=0.001) as compared to the Older Group (mean age 50 yrs [range 41 – 62]). However, post-operatively only the Tegner (p<0.001) was significantly better in the Younger group, whilst all other scores were comparable. Overall, PROMs had very little correlation with age following surgery.

	<40 Group (n=65)			≥40 Group (n=22)		
	Pre-Op Median	Post-Op Median	p-value[1]	Pre-Op Median	Post-Op Median	p-value[1]
KOOS Pain	63	89	<0.001*	56	89	<0.001*
KOOS Symptom	61	79	<0.001*	48	82	0.008*
KOOS ADL	75	97	<0.001*	57	97	<0.001*
KOOS Sport/Rec	35	75	<0.001*	25	75	0.007*
KOOS QoL	19	63	<0.001*	19	69	<0.001*
KOOS Overall	50	81	<0.001*	42	81	0.002*
IKDC	45	76	<0.001*	34	74	<0.001*
Lysholm	57	87	<0.001*	44	87	<0.001*
Tegner	2	6	<0.001*	1	4	0.005*
EQ-5D Index	0.628	0.837	<0.001*	0.596	0.837	0.006*
EQ-5D VAS	70	80	0.005*	60	90	0.014*
SF-12 MCS	51	55	0.317	51	50	0.778
SF-12 PCS	37	55	<0.001*	30	52	0.004*

Table 1: Within-group comparison of *pre*-operative vs *post*-operative PROMs

[1]Wilcoxon Signed Ranks Test
*Statistically Significant <0.05

	Pre-Operative			Post-Operative		
	<40 Group (n=65) Median	≥40 Group (n=22) Median	p-value[1]	<40 Group (n=65) Median	≥40 Group (n=22) Median	p-value[1]
KOOS Pain	63	56	0.007*	89	89	0.577
KOOS Symptom	61	48	0.144	79	82	0.434
KOOS ADL	75	57	<0.001*	97	97	0.767
KOOS Sport/Rec	35	25	0.120	75	75	0.815
KOOS QoL	19	19	0.295	63	69	0.144
KOOS Overall	50	42	0.017*	81	81	0.434
IKDC	45	34	0.005*	76	74	0.385
Lysholm	57	44	0.015*	87	87	0.803
Tegner	2	1	<0.001*	6	4	<0.001*
EQ-5D Index	0.628	0.596	0.192	0.837	0.837	0.891
EQ-5D VAS	70	60	0.233	80	90	0.286
SF-12 MCS	51	51	0.990	55	50	0.355
SF-12 PCS	37	30	0.001*	55	52	0.512

Table 2: Between-group comparison of PROMs, *pre*- and *post*-operatively

[1]Mann-Whitney U Test
*Statistically Significant <0.05

Conclusion

Older patients with ACL instability have just as much to gain as younger patients from surgical intervention. Therefore, age should not be a contra-indication to ACL reconstruction.

References

1. ROOS, E. M.; LOHMANDER, L. S. The Knee injury and Osteoarthritis Outcome Score (KOOS): from joint injury to osteoarthritis. Health Qual Life Outcomes, 1, p. 64, Nov 3 2003.
2. Irrgang, J. J., et al. (2001). "Development and validation of the international knee documentation committee subjective knee form." Am J Sports Med 29(5): 600-613.
3. Tegner, Y. and J. Lysholm (1985). "Rating systems in the evaluation of knee ligament injuries." Clin Orthop Relat Res(198): 43-49.
4. EuroQol, G. (1990). "EuroQol--a new facility for the measurement of health-related quality of life." Health Policy 16(3): 199-208.
5. Ware, J., Jr., et al. (1996). "A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity." Med Care 34(3): 220-233.