- Abstract No. : F-0060
- Category : Shoulder
- Detail Category : Rotator cuff

Does Preoperative Exercise Improve Functional Recovery After Rotator Cuff Repair? A Prospective Randomized Trial

Du-Han Kim [1] , **Chul-Hyun Cho [1]** , **Du-Han Kim [1]**
정형외과, Keimyung University School of Medicine , Korea, Republic of[1]

Introduction and Background

Preoperative exercise (PE) has been proposed to improve postoperative outcomes by optimizing joint function and muscle strength before orthopedic surgery. However, evidence regarding its effectiveness in patients undergoing arthroscopic rotator cuff repair (ARCR) remains limited. This study aimed to investigate whether PE could enhance postoperative recovery and functional outcomes following ARCR.

Material and Method

A prospective randomized controlled trial was conducted, including patients scheduled for ARCR between October 2022 and October 2024. Only patients with small to medium full-thickness rotator cuff tears were enrolled. The PE group completed a 4-week supervised exercise program focusing on shoulder range of motion (ROM), scapular stabilization, and rotator cuff–specific strengthening. Primary outcomes included the University of California, Los Angeles (UCLA) score, American Shoulder and Elbow Surgeons score, and visual analogue scale pain score at 6 weeks, 3 months, 6 months, and 12 months postoperatively. Secondary outcomes included passive ROM, postoperative stiffness, and re-tear rate, which was assessed at 6 months using ultrasonography or magnetic resonance imaging.

Results

A total of 78 patients were analyzed (40 in the PE group and 38 in the control group). There were no significant differences in baseline demographic characteristics between groups. The PE group demonstrated a significantly higher UCLA score at 6 months postoperatively (30.1 ± 3.0 vs 27.3 ± 4.3, **p=0.049**). Other functional outcomes and shoulder ROM showed no significant differences between the groups throughout the follow-up period. Postoperative stiffness at 6 weeks occurred in 22.5%(9/40) of the PE group and 42.1%(16/38) of the control group (p=0.087). The re-tear rate was 10.0%(4/40) in the PE group and 18.4%(7/38) in the control group (p=0.342). However, neither postoperative stiffness nor re-tear rates differed significantly between groups.

Conclusions

Preoperative exercise may offer modest benefits for functional recovery after arthroscopic rotator cuff repair. However, given the limited sample size, further studies with larger cohorts are needed to clarify its clinical impact.

Figure & Table 1.

Table 1. Demographic characteristics between both groups

Variables	PE group (40)	Control group (38)	p value
Age	56.2 ± 8.4	59.5 ± 6.8	.059
Sex			.255
Male	18(45.0)	22(55.0)	
Female	22(57.9)	16(42.1)	
Involved side			.085
Dominant	24(52.2)	22(47.8)	
Nondominant	16(50.0)	16(0.0)	
Tear size			.189
Small	16(61.5)	10(38.5)	
Medium	18(45.0)	27(55.0)	
Duration of symptoms	11.5 ± 11.6	17.2 ±17.5	.094
Preoperative ROM			
forward flexion	163.5° ± 15.8°	162.4° ± 20.3°	.784
abduction	162.3° ± 18.9°	159.9° ± 25.1°	.636
external rotation	76.9° ± 7.4°	75.4° ± 10.7°	.477
internal rotation	10.6° ± 3.1°	11.3° ± 3.4°	.331
Functional outcomes			
UCLA pain score	16.4 ± 2.5	16.6 ± 3.1	.422
VAS score	4.9 ± 1.8	5.1 ± 1.8	.705
ASES score	52.0 ± 16.3	53.3 ± 16.5	.712

Table 2. Functional outcomes and shoulder range of motion between both groups

	Group	preOP	After Surgery 6 Week	After Surgery 3 Months	After Surgery 6 Months	After Surgery 12 Months	P value
UCLA	PE	16.7 ± 2.9	19.5 ± 4.3	23.1 ± 3.8	30.1* ± 3.0	31.5 ± 3.3	
	Control	16.3 ± 3.1	20.9 ± 4.9	24.0 ± 3.8	27.3 * ± 4.3	30.8 ± 4.3	.049*
VAS	PE	4.7 ± 1.9	2.9 ± 1.4	2.8 ± 1.4	1.6 ± 1.6	0.9 ± 1.3	
	Control	5.2 ± 1.9	2.9 ± 1.1	2.7 ± 1.3	1.9 ± 1.2	1.2 ± 1.5	.551
ASES	PE	53.8 ± 17.2	66.3 ± 10.8	70.9 ± 13.0	86.2 ± 11.4	92.0 ± 9.4	
	Control	52.1 ± 16.8	64.7 ± 11.5	70.9 ± 11.7	80.4 ± 12.4	89.0 ± 12.6	.503
FF	PE	163.0 ± 17.6	133.3 ± 13.0	148.0 ± 16.1	163.0 ± 9.2	163.2 ± 28.4	
	Control	162.2 ± 21.8	126.9 ± 18.0	143.1 ± 17.3	160.6 ± 12.7	167.2 ± 6.8	.407
Abd	PE	164.7 ± 15.5	110.7 ± 14.6	132.7 ± 24.3	155.3 ± 17.8	166.7 ± 11.5	
	Control	159.2 ± 27.1	105.3 ± 18.5	125.9 ± 20	152.2 ± 20.7	164.7 ± 12.2	.613
ER	PE	76.2 ± 8.3	44.7 ± 11.4	57.3 ± 16.2	69.3 ± 13.1	77.7 ± 7.3	
	Control	74.8 ± 11.5	39.1 ± 12	53.1 ± 12.3	69.1 ± 13.0	76.6 ± 7.9	.551
IR	PE	10.6 ± 3.3	13.9 ± 0.8	12.4 ± 3.4	9.4 ± 3.3	6.7 ± 1.9	
	Control	11.4 ± 3.5	15.4 ± 1.1	13.7 ± 2.2	10.0 ± 3.3	7.7 ± 2.7	.839

Table 3. Postoperative stiffness and re-tear between both groups

	PE group (40)	Control group (38)	p value
PO 6wks stiffness	9(22.5%)	16(42.1%)	.087
PO 3mo stiffness	5(12.5%)	5(13.2%)	1.000
Re-tear	4(10.0%)	7(18.4%)	.342