

Return to Sport after Posterior Horn Root Repair in Competitive Athletes

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INTRODUCTION:

The purpose was to report clinical and functional outcomes, including patient reported outcome measures (PROMs) and return to sport (RTS) data, in competitive athletes who underwent posterior horn root repair (PHRR) at minimum 2-year follow-up.

METHODS:

A retrospective review was performed to identify all competitive athletes who underwent PHRR between 2010-2022 at a single institution. Competitive athletes were defined as those playing high school, collegiate, or professional sports at the time of surgery. Patients who underwent both a lateral and medial PHRR were excluded. Clinical exam findings and PROMs, including Visual Analog Scale (VAS), Tegner activity scale, Lysholm score, and International Knee Documentation Committee Subjective (IKDCs) score, were analyzed. Postoperative RTS, complication & revision rates, and surgery satisfaction at final follow-up were evaluated.

RESULTS:

Forty-seven patients (mean age: 17.7 ± 3.1 , mean BMI: 24.4 ± 4.3) were included (Table 1). Thirty-five patients (74%) underwent a lateral meniscus root repair. Majority of the patients (55%) were high school athletes at the time of surgery. Forty patients (85%) suffered an acute injury and 9 patients (19%) had a history of prior surgery on their knee. Concomitant procedures are documented in Table 2. Twenty-eight patients (60%) underwent a concomitant anterior cruciate ligament reconstruction. The mean pre-operative meniscus extrusion was 3.0 ± 1.2 mm Post-operative Kellgren-Lawrence grades were significantly increased from pre-operative grades ($p < 0.013$). The average International Cartilage Repair Society grade was 0.7 ± 1.3 . There was a significant improvement in pre- vs. post-operative range of motion ($p < 0.0001$). The mean follow-up was 5.3 ± 2.5 years. Post-operative PROMs included VAS at rest of 0.7 ± 1.2 , VAS with use of 2.5 ± 2.1 , IKDCs of 84.4 ± 13.3 , Lysholm of 81.5 ± 15.9 , and Tegner of 6.8 ± 2.3 (Table 3). The average surgery satisfaction was 7.9 ± 2.3 and average VAS 5-point was 3.8 ± 1.4 . Eighty-five percent of patients were able to RTS, 36% at the prior level, with the majority of patients RTS after 6 months (78%) (Table 4). The most common sport returned to was basketball (29%). There were 8 (17%) patients who underwent reoperation at final follow-up (Table 5). However, no patients underwent a revision root repair.

DISCUSSION AND CONCLUSION:

Competitive athletes who underwent PHRR demonstrated satisfactory post-operative outcomes at minimum 2-year follow-up despite a high rate of concomitant procedures. Most patients were able to return to sport, although less than half did so at the prior level.

Characteristic	Cohort (N = 47)
Age	17.7 ± 3.1
Sex	
Male	32 (68)
Female	15 (32)
BMI	24.4 ± 4.3
Laterality	
Right	21 (45)
Left	26 (55)
Acute Injury	40 (85)
Medial or Lateral Meniscus	
Medial	12 (26)
Lateral	35 (74)
Level of Athlete	
High School	26 (55)
Collegiate	17 (36)
Professional	4 (9)
Injury	
Pre-operative Meniscus Extrusion	3.0 ± 1.2
K/L grade	
Pre-operative	0.3 ± 0.4
Post-operative	0.4 ± 0.9
ICRS medial compartment	0.7 ± 1.3

(Data are expressed as mean \pm SD (95% CI) or n (%).

Characteristic	Cohort (N = 47)
ACLR*	28
Medial Meniscus Repair	6
Chondroplasty	4
Lateral Meniscectomy	3
Lateral meniscus anterior horn repair	2
Isthmal Band Tenodesis	2
Lateral Meniscus Repair	2
MCL Repair	2
Osteotomy	1
Medial Meniscus Repair	1
Osteochondral autograft transfer LFC	1
Injury Meniscus MFC OCD	1
LFC Osteochondral Allograft Transfer	1
Lateral Distal Femoral Tenodesis	1
PCL avulsion repair	1
Bursectomy	1
MPLR†	1

*Multiple procedures may have been performed at the time of operation.
 †Includes revisions and repeat operations.
 ACLR - anterior cruciate ligament reconstruction, LFC - lateral femoral condyle, MFC OCD - medial femoral condyle osteochondritis dissecans, LFC - lateral femoral condyle, PCL - posterior cruciate ligament, MCL - medial cruciate ligament, MPLR - medial patellofemoral ligament reconstruction

Characteristic	N = 28
Mean Follow-Up (years)	5.3 ± 2.5
IKDC score, points	84.4 ± 13.3
Lysholm score, points	81.5 ± 15.9
Tegner activity score, points	6.8 ± 2.3
VAS pain score, points	
At rest	0.7 ± 1.2
With use	2.5 ± 2.1
Surgery Satisfaction (0-10)	7.9 ± 2.3
Surgery improvement (0-1)	3.8 ± 1.4

*Data are expressed as mean \pm SEM (95% CI) or n (%). IKDC, International Knee Documentation Committee; VAS, visual analog scale; RTS, return to sport
 †Percentages are based on the amount of people who RTS.

Characteristic	N = 33
RTS	
Return to sport	28 (85)
Sports played**	
Basketball	8 (29)
Soccer	6 (21)
Football	5 (18)
Volleyball	2 (7)
Gymnastics	2 (7)
Wrestling	2 (7)
Figure Skating	1 (4)
Motocross	1 (4)
Baseball	1 (4)
Return to sport time*	
<6 months	6 (21)
6 months-1 year	11 (39)
>1 year	11 (39)
Return to sport at same level*	10 (36)

*Data are expressed as mean \pm SEM (95% CI) or n (%). IKDC, International Knee Documentation Committee; VAS, visual analog scale; RTS, return to sport
 **Percentages are based on the amount of people who RTS.

Characteristic	N = 8
ACLR†	5
Medial Meniscectomy	3
PCLR*	2
LCLR	2
Chondroplasty	2
Medial Meniscus Repair	1
MCLR	1
Lysis of Adhesions	1
Staphylococci	1
Lateral Meniscectomy	1
Hardware Removal	1
Lateral Meniscus Transplant	1
Meniscus Collapsus Implantation	1
Debridement	1

*Multiple procedures may have been performed at the time of operation.
 †Includes revisions and repeat operations.