

## ORIGINAL RESEARCH

# Assessment of outcome of simultaneous ACL and PCL reconstruction using arthroscopic technique

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Received: 11 July, 2022

Accepted: 14 August, 2022

### ABSTRACT

**Background:** Injuries to the anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) are common knee injuries. The present study was conducted to assess outcome of simultaneous ACL and PCL reconstruction using arthroscopic technique. **Materials & Methods:** 65 patients with combined anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) injury of both genders were included. Preoperative and post-operative Lysholm scores and IKDC scores were assessed. Patients were managed arthroscopically. Patients were evaluated clinically during their follow up visits. **Results:** out of 65 patients, males were 38 and females were 27. The etiology was RTA in 40, fall in 8 and violence in 17 patients. Functional outcome was excellent in 30, good in 14, fair in 21 and poor in 0. IKDC score pre-op was 32.6 and post-op was 84.3. Lysholm score pre-op was 35.9 and post-op was 91.4. The difference was significant ( $P < 0.05$ ). **Conclusion:** Regardless of the length of time since the injury, simultaneous ACL and PCL restoration utilizing an arthroscopic approach is a safe and successful treatment that also helps to accomplish early recovery and reduce the number of hospital days spent.

**Keywords:** anterior cruciate ligament, Functional outcome, IKDC score

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### INTRODUCTION

Injuries to the anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) are common knee injuries, often occurring during sports activities or traumatic events.<sup>1</sup> The ACL is one of the major ligaments in the knee, located in the center of the joint, connecting the femur (thighbone) to the tibia (shinbone). ACL injuries often occur during activities that involve sudden stops, changes in direction, or direct blows to the knee, such as pivoting, cutting, or landing from a jump.<sup>2</sup> Symptoms of an ACL injury may include a "pop" sound at the time of injury, swelling, pain, instability or a feeling of giving way in the knee, and difficulty bearing weight on the affected leg. The PCL is located in the back of the knee joint, connecting the femur to the tibia. It plays a key role in stabilizing the knee and preventing posterior translation of the tibia relative to the femur.<sup>3</sup>

PCL injuries are less common than ACL injuries and often occur due to direct blows to the front of the knee or from hyperextension injuries. Symptoms of a PCL injury may include pain, swelling, difficulty walking,

and instability in the knee, particularly during activities that involve bending or bearing weight.<sup>4</sup> Diagnosis of an ACL injury is typically made based on a combination of physical examination findings, imaging studies (such as MRI), and clinical history. Treatment options for ACL injuries may include conservative management with physical therapy and bracing for less severe injuries, or surgical reconstruction for more severe injuries, especially in individuals who are young, active, or participate in high-demand sports.<sup>5</sup> The present study was conducted to assess outcome of simultaneous ACL and PCL reconstruction using arthroscopic technique.

### MATERIALS & METHODS

The present study consisted of 65 patients with combined anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) injury of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Preoperative and post-operatively Lysholm scores and IKDC scores were assessed. Patients were managed arthroscopically. Patients were evaluated clinically

during their follow up visits. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Total- 65		
Gender	Male	Female
Number	38	27

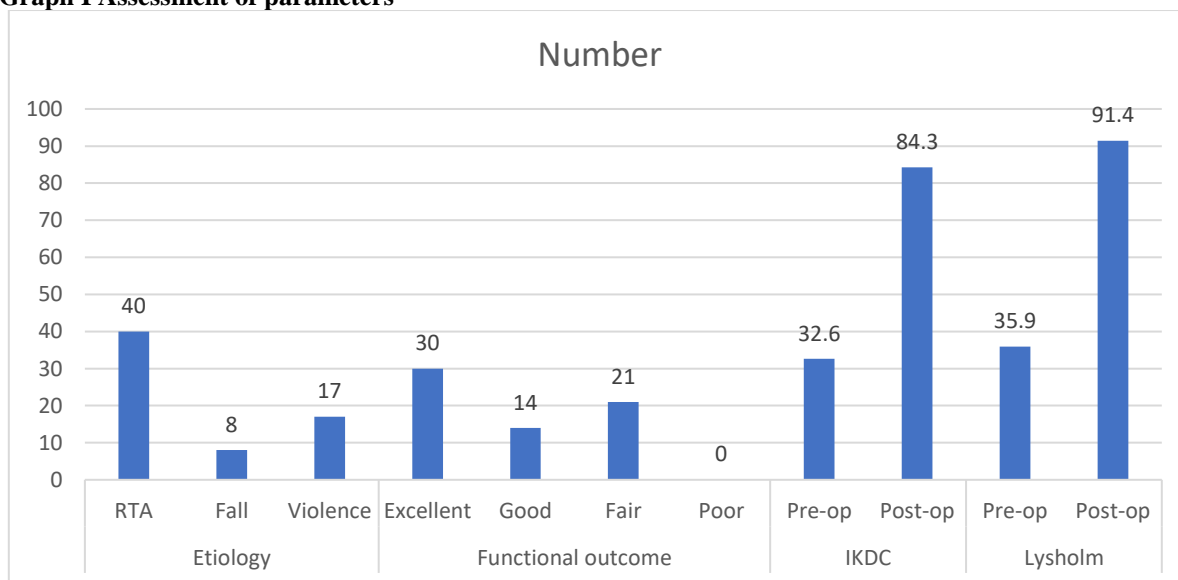
Table I shows that out of 65 patients, males were 38 and females were 27.

**Table II Assessment of parameters**

Parameters	Variables	Number	P value
Etiology	RTA	40	0.02
	Fall	8	
	Violence	17	
Functional outcome	Excellent	30	0.05
	Good	14	
	Fair	21	
	Poor	0	
IKDC	Pre-op	32.6	0.01
	Post-op	84.3	
Lysholm	Pre-op	35.9	0.01
	Post-op	91.4	

Table II, graph I shows that etiology was RTA in 40, fall in 8 and violence in 17 patients. Functional outcome was excellent in 30, good in 14, fair in 21 and poor in 0. IKDC score pre-op was 32.6 and post-op was 84.3. Lysholmscore pre-op was 35.9 and post-op was 91.4. The difference was significant (P< 0.05).

**Graph I Assessment of parameters**



**DISCUSSION**

Rehabilitation plays a crucial role in the management of both ACL and PCL injuries, whether treated conservatively or surgically.<sup>6</sup> Physical therapy aims to strengthen the surrounding muscles, improve range of motion, and restore functional stability to the knee joint.<sup>7</sup> In cases of surgical reconstruction, rehabilitation is typically tailored to the individual patient's needs and may involve a gradual progression

of exercises and activities to optimize recovery and return to sport or daily activities.<sup>8</sup>

We found that out of 65 patients, males were 38 and females were 27. Shivanna et al<sup>9</sup> evaluated the outcomes of combined ACL and PCL injuries in 20 patients were managed arthroscopically. Preoperative and post-operative Lysholm scores and IKDC scores were assessed to evaluate the patients' outcomes. Out of 20 patients operated for ACL and PCL injury, 14(70%) of them had excellent to good results and the

rest 6(30%) had fair results with none of the patients reporting poor results.

We found that etiology was RTA in 40, fall in 8 and violence in 17 patients. Functional outcome was excellent in 30, good in 14, fair in 21 and poor in 0. IKDC score pre-op was 32.6 and post-op was 84.3. Lysholm score pre-op was 35.9 and post-op was 91.4. Lo et al<sup>10</sup> in their study eleven consecutive patients (6 males and 5 females) with both ACL and PCL disruptions were enrolled in the prospective study and treated with arthroscopic combined reconstruction of ACL and PCL using hamstring and quadriceps tendon autografts in a single operation. The average period from injury to operation was 76 days (range, 30-150 days), and the mean age was 33 years (range, 19-48 years) for those who underwent the operation. Mean follow-up time was 55 months (range, 36-78 months). Follow-up examinations included Lysholm knee score, Tegner activity score, International Knee Documentation Committee (IKDC) score, thigh muscle assessment, and radiographic evaluation. Ten of 11 (91%) patients showed good or excellent results. Statistically significant improvements were observed in Lysholm score ( $p = 0.008$ ), Tegner score ( $p = 0.038$ ), postoperative KT-1000 scores ( $p = 0.001$ ), final IKDC rating ( $p = 0.032$ ), and thigh atrophy and muscle strength ( $p < 0.05$ ). Regarding IKDC final rating, 82% (9 of 11) of the patients were assessed as normal or nearly normal (grade A or B).

Mariani et al<sup>11</sup> evaluated 15 consecutive patients who underwent simultaneous isolated, arthroscopically assisted anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) reconstruction. A bone-patellar tendon-bone autograft was used as the PCL substitute and doubled hamstring tendons were used as the ACL graft. The IKDC evaluation form and the HSS, Lysholm, and Tegner clinical rating scales were used to make clinical evaluations. Anteroposterior translation was measured with the KT-2000 arthrometer and stress view radiography. At final IKDC evaluation, 3 patients (20%) were graded A, 7 (46.7%) were graded B, 3 (20%) were graded C, and 1 patient (6.7%) was graded D. One patient underwent revision surgery in another hospital for severe postoperative residual laxity. Two C-graded patients had an unsatisfactory outcome as a result of serious complications related to knee injuries. All patients with a grade A or B returned to sports activity. At stress view examination, mean posterior side-to-side translation measured at the lateral tibial plateau was 5.8 +/- 1.1 mm and the mean translation at the medial tibial plateau was 7.3 +/- 1.5 mm; the mean anterior dislocation was 3.3 +/- 0.4 mm. The preoperative HSS score rated an average of 32 +/- 9. Postoperatively, the average score reached was 89.6 +/- 8.3. The preoperative Lysholm score was 65.5 +/- 9.1 (range, 48 to 78) in patients with chronic lesions and at follow-up was 95.1 +/- 4.5 (range, 88 to 100). The average Tegner activity score decreased in patients with chronic lesions from 6.9 +/- 1.7 (range, 4

to 9) before injury to 5.5 +/- 1.6 (range, 2 to 9) at follow-up ( $P = .053$ ). At follow-up, 7 patients (50%) returned to their preinjury level after surgery.

Denti et al<sup>12</sup> in their study 20 consecutive patients with chronic ACL and PCL deficiency who underwent simultaneous single-stage arthroscopic reconstruction of the central pivot were retrospectively reviewed. All patients had received either an allograft (group A) or a semitendinosus-gracilis graft for ACL repair and a bone-patellar tibial-bone graft for PCL repair (group B). They found that the mean per cent quadriceps strength deficit in the operated as compared to the healthy knee was 13.5 % in group A and 15 % in group B (angular velocity 60°/s) and 13.5 % in group A and 9.4 % in group B (angular velocity 180°/s). The mean per cent flexor strength deficit in the operated as compared to the healthy knee was 10.4 % in group A and 12.3 % in group B (angular velocity 60°/s) and 12.2 % in group A and 9 % in group B (angular velocity of 180°/s). The flexor-quadriceps ratio was 49.4 % in group A and 48.8 % in group B in the healthy knee and 53.2 % in group A and 53.8 % in group B in the operated knee (angular velocity 60°/s) and 63.9 % in group A and 60.7 % in group B in the healthy knee and 65 % in group A and 64.9 % in group B in the operated knee (angular velocity 180°/s). Lysholm outcome was 93.9 ± 3.9 in group A and 89.1 ± 7.6 in group B. Cincinnati score was 89.6 ± 7.3 in group A and 91.0 ± 6.9 in group B ( $p = 0.791$ ). IKDC results were group A in six patients (60 %), group B in three patients (30 %) and group C in one patient (10 %) in the allograft group and group A in seven patients (70 %) and group B in three patients (30 %) for autologous group. The limitation of the study is the small sample size.

## CONCLUSION

Authors found that regardless of the length of time since the injury, simultaneous ACL and PCL restoration utilizing an arthroscopic approach is a safe and successful treatment that also helps to accomplish early recovery and reduce the number of hospital days spent.

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