

## A Prospective Study to Evaluate the Outcome in the Management of Combined ACL and PCL Injuries

Chinmoy Sharma<sup>1</sup>, Pankaj Bansal<sup>2</sup>, Sunil Yadav<sup>3\*</sup>

<sup>1</sup>Consultant Orthopaedic Surgeon, Arya Hospital, Guwahati, Assam, India

<sup>2</sup>Senior Resident, Dept. of Orthopaedics, Bhagwan Mahavir Government Hospital, Delhi, India

<sup>3</sup>Senior Resident, Sports Injury Centre, Safdarjung Hospital, Delhi, India

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### Abstract

**Background:** Combined anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) disruptions are uncommon orthopaedic injuries. Although some authors recommended cast immobilization for treatment, others advocated operative repair. Hence; the present study was undertaken for assessing the outcome in the management of combined ACL and PCL injuries. **Materials & Methods:** A total of 25 patients diagnosed with presence of combined ACL and PCL injuries were enrolled. Complete demographic and clinical details of all the subjects were obtained. Clinical and radiographic examination of the subjects was carried out. All the patients underwent simultaneous arthroscopic reconstruction. Assessment of pre-treatment and post-treatment Lysholm scores and IKDC scores was done for analysis of outcome of all the patients. Follow-up was done and data of all the patients was recorded separately. **Results:** Excellent outcome was seen in 32 percent of the patients while good outcome was seen in 40 percent of the patients. Fair outcome was seen in 28 percent of the patients. Mean IKDC score during pre-treatment and post-treatment time was 33.1 and 86.4 respectively. Mean Lysholm score during pre-treatment and post-treatment time was 37.2 and 88.6 respectively. While comparing pre-treatment and post-treatment scores, significant results were obtained. **Conclusion:** By using arthroscopic technique, simultaneous ACL and PCL reconstruction is an excellent procedure and helps to achieve early rehabilitation.

**Keywords:** Anterior Cruciate Ligament, Posterior Cruciate Ligament.

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### Introduction

Combined anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) disruptions are uncommon orthopaedic injuries. They are usually caused by high- or low-velocity knee dislocations. Because knee dislocations might spontaneously reduce before initial evaluation, the true incidence is unknown. Dislocation involves injury to multiple ligaments of the knee. Both of the cruciate ligaments are usually disrupted, and they are often combined with a third ligamentous disruption (medial collateral ligament or lateral collateral ligament and/or posterior lateral complex). Associated neurovascular, meniscal, and osteochondral injuries are often present and complicate treatment[1-3].

Because the incidence of these injuries is low, early literature led to controversy on the optimal treatment. Historically, these injuries were managed conservatively with prolonged immobilization, which was associated with variable outcomes, including loss of motion, residual instability, and poor knee function. Although some authors recommended cast immobilization, others advocated operative repair. With the advent of modern arthroscopic techniques and better instrumentation, operative reconstruction has become the standard of care[4-6]. Hence; the present study was undertaken for assessing the outcome in the management of combined ACL and PCL injuries

### Materials & methods

The present study was undertaken in the department of orthopedic surgery, Safdarjung hospital, Delhi with the aim of assessing the outcome in the management of combined ACL and PCL injuries.

Ethical approval was obtained from the institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 25 patients diagnosed with presence of combined ACL and PCL injuries were enrolled. Complete demographic and clinical details of all the subjects were obtained. Clinical and radiographic examination of the subjects was carried out. All the patients underwent Simultaneous arthroscopic reconstruction. Assessment of pre-treatment and post-treatment Lysholm scores and IKDC scores was done for analysis of outcome of all the patients. Follow-up was done and data of all the patients was recorded separately. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test and student t test were used for evaluation of level of significance.

### Results

48 percent of the patients belonged to the age group of 40 to 60 years. 36 percent and 16 percent of the patients belonged to the age group of less than 40 years and more than 60 years respectively. 72 percent of the patients were males while the remaining were females. In 60 percent of the patients, etiology was road traffic accident. Excellent outcome was seen in 32 percent of the patients while good outcome was seen in 40 percent of the patients. Fair outcome was seen in 28 percent of the patients. Mean IKDC score during pre-treatment and post-treatment time was 33.1 and 86.4 respectively. Mean Lysholm score during pre-treatment and post-treatment time was 37.2 and 88.6 respectively. While comparing pre-treatment and post-treatment scores, significant results were obtained.

\*Correspondence

Dr. Sunil Yadav

Senior Resident, Sports Injury Centre, Safdarjung Hospital, Delhi, India.

E-mail: [drsuniyadavind47@gmail.com](mailto:drsuniyadavind47@gmail.com)

**Table 1: Demographic Data**

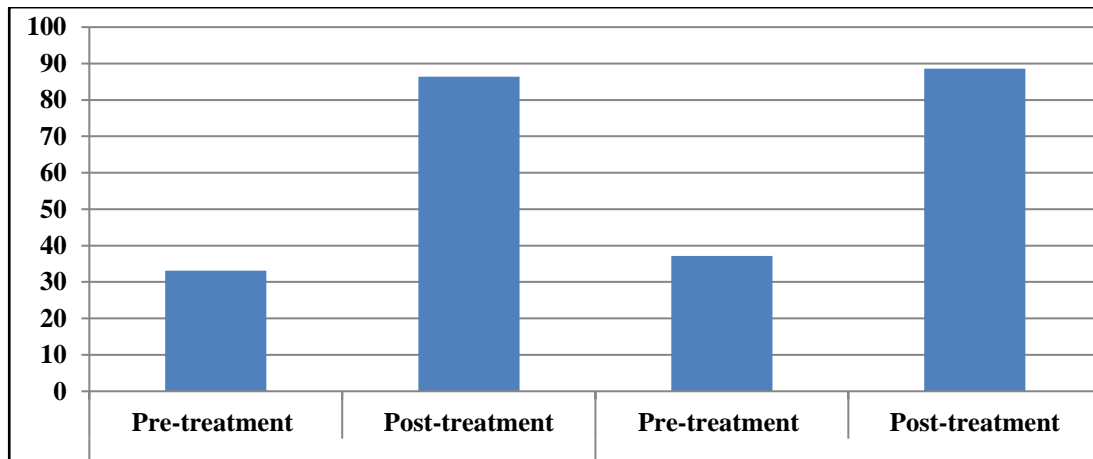
Variable	Number of patients	Percentage
Age group (years)	Less than 40	9
	40 to 60	12
	More than 60	4
Gender	Males	18
	Females	7
Etiology	Road traffic accident	15
	Fall from height	10

**Table 2: Outcome**

Outcome	Number of patients	Percentage
Excellent	8	32
Good	10	40
Fair	7	28
Poor	0	0
Total	25	100

**Table 3: Comparison of IKDC and Lysholm scores**

Score	Mean	SD	p-value
IKDC score	Pre-treatment	33.1	8.4
	Post-treatment	86.4	7.1
Lysholm score	Pre-treatment	37.2	5.2
	Post-treatment	88.6	6.1



**Fig 1: Comparison of IKDC and Lysholm scores**

**Discussion**

Knee joint is subjected to many injury patterns involving osseous structures and ligaments. Combined anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) injury is rare. There are few studies in the literature related to this topic. It is important to manage these injuries with great accuracy as it may involve damage to neurovascular structures associated with knee dislocation. Though there are studies advocating non operative management of these injuries, there is also evidence suggesting operative management with better outcomes[7-9]. Hence; the present study was undertaken for assessing the outcome in the management of combined ACL and PCL injuries.

In the present study, 48 percent of the patients belonged to the age group of 40 to 60 years. 36 percent and 16 percent of the patients belonged to the age group of less than 40 years and more than 60 years respectively. Panigrahi R et al evaluated functional outcome of simultaneous arthroscopic ACL and PCL reconstruction with hamstring tendon autograft in multiligamentous knee injuries. 20 patients with combined ACL-PCL injuries who underwent simultaneous arthroscopic ACL-PCL reconstruction with hamstring tendon were analyzed. In 20 patients, mean age 34 years, return to full-time work and to full sports was 8 weeks and 6.2 months

respectively. All patients had full range of motion except 2 patients with < 5 degrees flexion loss; 90% had negative lachman test; 95% had negative pivot shift and 10% patients had mild posterior drawer at 90 degrees (I+) at final follow up. Mean IKDC score was 90 (range 81 - 94); mean Tegner activity score was 7 and mean Lysholm knee score was 89. 85% returned to preinjury activity level and a 90% satisfaction rate. Simultaneous arthroscopic ACL and PCL reconstructions using hamstring tendon for combined ACL and PCL injuries is a clinically effective, safe, time saving and cost-effective procedure with better patient compliance and reproducible for a timely return of motion, strength, and function with favorable outcome[10].

In the present study, 72 percent of the patients were males while the remaining were females. In 60 percent of the patients, etiology was road traffic accident. Excellent outcome was seen in 32 percent of the patients while good outcome was seen in 40 percent of the patients. Fair outcome was seen in 28 percent of the patients. Mygind-Klavnsen B et al evaluated the clinical and functional outcome after isolated or multiligament PCL reconstruction. Standardized follow-up was performed and consisted of subjective scores (Tegner activity score, Knee injury and Osteoarthritis Outcome Score [KOOS], and subjective International Knee Documentation Committee [IKDC]

score) and objective measures, including knee laxity (KT-1000), extension strength, and overall IKDC score. One hundred ninety-six patients were identified, of which 172 were available for postoperative follow-up: 39.3% with isolated PCL and 60.7% with multiligament injury. At 1-year follow-up there were significant differences in KOOS outcome scores between the isolated PCL subgroup and the multiligament subgroup, but no differences at final follow-up. Twelve patients (5%) had PCL revision surgery within the follow-up period. Despite the type of injury, there were only minor differences in knee laxity and subjective outcome scores between the isolated PCL group and the multiligament group. The overall revision rate in this study was 5.2% [11].

In the present study, Mean IKDC score during pre-treatment and post-treatment time was 33.1 and 86.4 respectively. Mean Lysholm score during pre-treatment and post-treatment time was 37.2 and 88.6 respectively. While comparing pre-treatment and post-treatment scores, significant results were obtained. Recently, the Danish Knee Ligament Reconstruction Registry reported clinical outcomes of 237 isolated PCL reconstructions and 344 multiligament reconstructions with combined PCL reconstruction at 1-year follow-up. The authors were able to obtain patient-reported outcome measures, specifically, the Knee injury and Osteoarthritis Outcome Score (KOOS) and Tegner functional score, to better quantify the patients' subjective experience of their outcome. The authors reported an improvement in the KOOS from preoperative to 1-year follow-up for both isolated PCL reconstructions and multiligament reconstructions but were careful to note that the degree of improvement was not commensurate with that seen with ACL reconstruction. By comparison, the authors reported a significantly lower reoperation rate for both isolated PCL reconstructions (3%) and multiligament PCL reconstructions (3.4%) [12].

#### Conclusion

From the above results, the authors conclude that by using arthroscopic technique, simultaneous ACL and PCL reconstruction is an excellent procedure and helps to achieve early rehabilitation.

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