



Original Research Article

Simultaneous arthroscopic reconstruction of anterior cruciate ligament and posterior cruciate ligament: An outcome analysis

Sunil Shivanna^{1,*}, Dinesh K M²¹Dept. of Orthopedics, Chamarajanagar Institute of Medical Sciences, Yadapura, Karnataka, India²Dept. of Orthopedics, BGS Global Institute of Medical Sciences, Bengaluru, Karnataka, India

ARTICLE INFO

Article history:

Received 26-10-2020

Accepted 30-12-2020

Available online 06-04-2021

Keywords:

PCL

Lyscholm score

IKDC

ABSTRACT

Introduction: Combined anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) injury is relatively a rare entity and it is extremely important to manage these injuries with great accuracy, as this may involve damage to neurovascular structures associated with knee dislocation and also carries the risk of accelerated joint degeneration if left untreated. There are many issues that are topic of debate even today like timing of surgery, graft of choice and single stage versus staged reconstruction.

Materials and Methods: A prospective study for evaluating the outcomes of combined ACL and PCL injuries in 20 patients was conducted at our centre, who were managed arthroscopically. Preoperative and post-operative Lyscholm scores and IKDC scores were assessed to evaluate the patients outcomes.

Results: 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.

Conclusion: Simultaneous ACL and PCL reconstruction using arthroscopic technique is an effective and safe procedure irrespective of the time since injury and also this is more helpful to achieve early rehabilitation.

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1. Introduction

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.¹⁻⁴ Though there are studies advocating non operative management of these injuries^{5,6}, there are also evidence suggesting operative management with better outcomes.^{7,8} The objective of our study is to examine the outcomes in the management of combined ACL and PCL injuries.

2. Materials and Methods

Ours is a prospective study evaluating the outcomes of combined ACL and PCL injuries in 20 patients at our centre who were managed arthroscopically between 2014 to 2018 by a single surgeon. Preoperative and post-operative lyscholm scores and IKDC scores were assessed to evaluate the patient's outcomes. Patients were evaluated clinically during their follow up visits and for those who could not come for follow up, data was collected over phone. Statistical analysis was done and p value calculated to assess the statistical significance between the comparative data.

3. Results

In our study we evaluated the functional outcome of the simultaneous arthroscopic ACL and PCL reconstruction in patients who had both ACL and PCL injuries. Out of 20 patients who were operated, 14 patients were in the age

* Corresponding author.

E-mail address: srsmysore@gmail.com (S. Shivanna).

group of 21-40 years (Table 1) and 18 out of 20 were male population (Table 2).

Table 1: Distribution of sample by age

Age group	Frequency	Percentage %
<20	3	15
21-30	8	40
31-40	6	30
41-50	0	00
51-60	3	15
>60	0	00
Total	20	100

Table 2: Distribution of sample by gender

Gender	Frequency	Percentage
Male	18	90
Female	2	10
Total	20	100

Road traffic accidents (RTA) accounted for 75 % of the incidences and was the most common mechanism of injury. Domestic fall accounted for 2 cases and sports related injury contributed to 3 cases out of 20 cases. (Table 3)

Table 3: Mechanism of Injury

Mechanism	Frequency	Percentage
RTA	15	75
Domestic fall	2	10
Sports	3	15
Total	20	100

Out of 20 patients operated for ACL plus PCL injury, 14(70%) of them had had excellent to good results and rest 6 had fair result with none of the patient reporting poor result (Table 4). Comparative analysis was done between pre surgery and post-surgery lyscholm score and we found that there was a statistically significant difference between them with p value <0.0001(Table 6). The mean post-operative lyscholm score for our patients was 89.1 and the mean IKDC score was 84.7.

Table 4: Distribution of sample based on functional outcome

Functional outcome	Frequency	Percentage
Excellent (95-100)	6	30
GOOD (84-95)	8	40
FAIR (65-83)	6	30
POOR <64	0	0
Total	20	100

4. Discussion

Combined ACL and PCL injuries are one of the rare knee injuries when neglected can lead to early degenerative



Fig. 1: Tibial tunnel for ACL



Fig. 2: Femoral tunnel for ACL



Fig. 3: ACL graft passing

Table 5: Comparison of pre-op and post-op IKDC scores

	Mean	SD	Variance
Pre-op IKDC	30.6	5.361	28.74
Post-op IKDC	84.7	4.506	20.30

Table 6: Comparison of pre-op and post-op Lysholm scores

	Mean	SD	Variance	Difference	Std error	95% CI	“t” statistic	P Value
Pre-op Lysholm	35.7	5.506	30.32	53.4	1.938	49.4 to 57.3	27.5	<0.0001
Post-op Lysholm	89.1	6.695	44.83					

**Fig. 4:** Bioscrew for ACL**Fig. 6:** PCL tunnel preparation**Fig. 5:** Portals for PCL reconstruction**Fig. 7:** Post operative knee flexion

changes in the knee. With advancement in the arthroscopic techniques, simultaneous reconstruction of ACL plus PCL has become possible these days. In our current study, we have arthroscopically managed 20 cases of ACL plus PCL injury through arthroscopic reconstruction using hamstring and sometimes BPTB grafts. It has been proven that surgical management is superior to conservative treatment as mentioned in few of the previous studies by Robertson A et al., Liow RY et al., Taylor AR et al., Wong CH et

al.^{4,8-10} In our management technique, we have always used autograft because of nonavailability of allografts and also to reduce the risk of disease transmission. Moreover autografts also has advantages of earlier incorporation.¹¹ The average age of our patients was 31.6 years with majority of them in the age group of 21- 40 years which indicates that this injury pattern is common among active adult population. This is similar to findings in other similar studies dealing



Fig. 8: Post operative knee extension

with combined ACL and PCL injury.^{3,12} Our study also noted that RTA was the most common mechanism of injury and this too is similar to findings in other similar studies by Mariani et al., and Lo YP et al.^{3,12} Coming to the functional outcomes, the average Lyscholm score post-surgery in our patients was 89.1 and the average IKDC scores was 84.7. There is a statistically significant difference in the functional outcome based on this scores with p value <0.0001 compared to its pre operative scores. This is in consensus with study conducted by Lo YP et al. and Mariani et al. From our study we also noticed that both early and late surgery for this combination of injury showed equally good results in relation to stability depending upon the extent of damage to the cartilage.

5. Conclusion

Simultaneous ACL and PCL reconstruction using arthroscopic technique is an effective and safe procedure irrespective of the time since injury and also this is more helpful to achieve early rehabilitation and to cut short the number of days of hospital stay and repeat surgery that the patient has to undergo if reconstructed in a staged manner. This also brings down the hospital expenses of the patient.

6. Source of Funding

None.

7. Conflict of Interest

The authors declare that there is no conflict of interest

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Author biography

Sunil Shivanna, Assistant Professor

Dinesh K M, Assistant Professor

Cite this article: Shivanna S, Dinesh K M. Simultaneous arthroscopic reconstruction of anterior cruciate ligament and posterior cruciate ligament: An outcome analysis. *Indian J Orthop Surg* 2021;7(1):49–52.