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Original Article

Functional Outcome of Arthroscopic Anterior Cruciate Ligament Reconstruction Using Hamstring Autograft

Deependra Yadav[1], Pratap Babu Bhandari[2], Sudeep Khanal[1], Sijan Bhattachan[1], Kishor Bista[1], Subash Gurung[3], Kiran Khanal[1], Binod Sherchan[1]

[1]National Trauma Center, Bir Hospital, Kathmandu
[2]Chitwan Medical College, Bharatpur, Chitwan
[3]Pokhara Academy of Health Sciences, Pokhara

ABSTRACT

Introduction: There are many autograft and allograft options available for ACL reconstruction. The use of hamstring autograft has become popular nowadays due to ease of harvest and less donor site morbidity. We have routinely been doing arthroscopic ACLR with hamstring autograft in our center. This study aims to evaluate the functional outcome of arthroscopic ACLR with hamstring autograft.

Method: This prospective study was done in National Trauma Center, Bir Hospital, Kathmandu from June 2019 to June 2020. Arthroscopic ACL reconstruction was done using hamstring autograft fixed with endobutton on the femoral side and bioabsorbable screw on the tibial side. Functional outcome was measured with IKDC score, Lysholm score, and return to pre-injury status.

Results: A total of 28 cases were included in the study. At the final follow-up, mild to moderate pain was present in seven patients (25%). Nine patients had numbness around the knee. Seven cases (25%) had grade I laxity with a hard endpoint. 82% of the patients had excellent to good functional outcomes, and 93% of cases had normal to near normal IKDC scores. 79% of patients returned to pre-injury level.

Conclusion: Arthroscopic ACL reconstruction with hamstring auto-graft has good to excellent functional outcomes, with the majority of patients returning to pre-injury status following compliance with physiotherapy.

Keywords: ACL, Arthroscopic Reconstruction, Hamstring Autograft, IKDC, Lysholm Score

INTRODUCTION

Anterior Cruciate ligament (ACL) tear is a commonly encountered knee injury. An untreated ACL injury accelerates degenerative changes in the knee joint, resulting in meniscal tears, cartilage damage, and early osteoarthritis. ACL reconstruction (ACLR) restores knee biomechanics and delays associated meniscal and cartilage damage and osteoarthritic changes in knee joints.

There are several autograft and allograft options available for the reconstruction of ACL. The use of hamstring autograft has become popular nowadays due to ease of harvest and less donor site morbidity.[1] We have routinely been doing arthroscopic ACLR with hamstring autograft in our center. This study aims to evaluate the functional outcome of arthroscopic ACLR with hamstring autograft.

Correspondance:

Dr. Pratap Babu Bhandari
Chitwan Medical College Teaching Hospital, Bharatpur 10, Chitwan, Nepal, Tel: 9855065922, Email: pratapbhandari2076@gmail.com

METHODS

This prospective study was done in National Trauma Center, Bir Hospital, Kathmandu from June 2019 to June 2020. Ethical clearance was taken from the Institutional Review Board . Written informed consent was obtained from all patients before they were enrolled in the study. All patients undergoing arthroscopic isolated ACL reconstruction with hamstring autograft were included in the study, while those with ACL avulsion, revision ACL surgery, concomitant meniscus or other ligaments or posterolateral corner injuries and bony injuries around the knee were excluded from the study. The sample size was calculated according to the formula:

$N=Z^2pq/d^2$

Where p= proportion of excellent and good functional outcome

q= 1-p

d= absolute precision (10%)

Taking p= 0.92 (92%) from the study done by Suresh Padya et al.[2]

d= absolute precision taking 10% and

z= confidence interval of 95% = 1.96

$N= (1.96)^2 \times 0.92 \times 0.08/ (0.1)^2 = 28$

Patients fulfilling the inclusion criteria underwent arthroscopic anatomic ACLR using hamstring autograft. The femoral side was fixed with an endobutton and the tibial side with a bioabsorbable screw. Surgery was done by fellowship-trained senior surgeons.

Post-operatively, the progression of physiotherapy was based on Moon's protocol.[3] Later, home-based exercises were done with periodic follow-ups and were applied to all patients. The outcome was measured with Subjective International Knee Documentation Committee (IKDC) questionnaires and Lysholm Knee Form evaluation done at 2, 6, 12 weeks, and 6 months post-operatively.[4,5] Data analysis was done with SPSS (Statistical Package for Social Science) version 21.0.

RESULTS

A total of 28 cases were included in our study, with a mean age of 26.7+/- 12.3 years (19-40 years). Road traffic accident was the most common cause (57%), followed by sports injuries (25%) and household injuries (18%).

Pain was the most common presenting complaint (82.14%) . Knee swelling was present in 75% of cases, and 50% of patients complained of knee clicking. Giving way of the knee was present in 78.6% of cases, while 39% gave the history of locking of the knee (table 1).

Table 1: Distribution of cases based on presenting complaints

Presenting complaints	Frequency	Percent
Pain	23	82.14
Giving way	22	78.6%
Swelling	21	75
Clicking	14	50
Locking	11	39

Mild to moderate pain was present in seven patients (25%). Superficial skin infection was present in three cases (11%). Nine patients had numbness around the knee. Seven cases (25%) had grade I laxity with the hard endpoint. Full ROM was not achieved in six cases (21%).

Postoperative functional scores are presented in Table 2.

82% of patients were compliant with postoperative rehabilitation protocol.

Table 2: Functional outcomes

	Frequency	Percentage
Lysholm score		
Excellent	7	25
Good	16	57
Fair	3	11
Poor	2	7
International Knee Documentation Knee score (IKDC)		
Normal	16	57
Near Normal	10	36
Abnormal	2	7
Return to pre-injury level		
Return to pre-injury level	22	79
Not return to pre-injury level	6	21

DISCUSSION

Arthroscopic ACL reconstruction using hamstring autograft has good to excellent functional outcomes with early return to pre-injury status. In this study, the Lysholm knee scoring scale was excellent in 25% of the patients, good in 57% of cases, fair in 11%, and poor in 7%. Poor results may be due to patients' non-adherence to rehabilitation protocol. Sudhakar et al. reported excellent outcomes in 27% of cases, good in 53%, fair in 13%, and poor in 7% of cases.[6] Similarly, Khan et al. reported excellent scores in 50%, good in 35%, fair in 10%, and poor in 5% of cases, which was similar to this study.[7]

IKDC score was normal in 57% of cases, near normal in 36%, and abnormal in 7% of cases in this study. Button et al. described normal IKDC in 54% and near normal in 38% of cases.[8] Similarly, Fareed et al. described normal IKDC in 48%, near normal in 48%, and abnormal in 4% of cases.[9] These findings were similar to this study.

In this study, 79% of patients returned to pre-injury level. Bourke et al. described that 67% of cases returned to pre-injury level, whereas Gulick et al. reported that 84% returned to pre-injury status following surgery, which is comparable to this study.[10, 11]

In this study, 82% of patients were compliant with postoperative rehabilitation protocol. Jagdeesh et al. also described a similar compliance rate of 83% in his study.[12]

This was a single-center study done within a limited time

period of one year with a small sample size. Surgery was done by different surgeons, so results may vary.

CONCLUSION

Arthroscopic ACL reconstruction with hamstring auto-graft has excellent to good functional outcomes, with the majority of patients returning to pre-injury status following compliance with physiotherapy. A larger study population with a longer follow-up study might provide a better evaluation of the long-term outcomes that could be generalized to the whole population.

CONFLICT OF INTEREST

None

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