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Functional Outcome Of Arthroscopic Anterior Cruciate Ligament Reconstruction With Hamstring Graft

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Abstract

Objective: The idea for this project was to increase the awareness regarding timely management of ACL injury and the good to the excellent outcome of this minimally invasive technique.

Materials and Methods: In this retrospective study, we included 10 patients who underwent arthroscopic transportal single bundle ACLR using hamstring autograft, between January 2019 to December 2021 in Isra university hospital Hyderabad. Patients were followed routinely and the outcome was recorded with the help of the Lysholm knee scoring questionnaire at 6 months and 12 months post-procedure.

Results: Mean age of the patients was 28.2 years (22 to 35 years) (Table-1). The average duration between injury to surgical intervention was 12.3 months (6 to 26 months). The outcome was excellent in 3 patients (60%), good in 6 patients (30%), and fair in one patient (10%).

Conclusion: Injury to ACL is a critical event for any individual. Its timely management is important not only to return the patient to pre-injury activity level but also to prevent delayed consequences of ACL tear. Our study and the literature review show satisfactory results of arthroscopic ACLR. Finally, one should follow the basic principles of the arthroscopic surgical technique of ACLR along with postoperative supervised physiotherapy rehabilitation protocol to get the desired results.

Keywords: Anterior Cruciate Ligament, Arthroscopy, Hamstring.

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1. Introduction

The anterior cruciate ligament (ACL) provides stability to the knee joint and prevents posterior translation of the femur on the tibia [1]. The incidence of ACL injuries is increasing owing to increased participation in sports. ACL reconstruction (ACLR) is one of the most common orthopaedic procedures performed worldwide and is considered the gold standard of care 2. Being a ligamentous structure, ACL has very little tendency to heal itself so to regain a stable knee, ACLR is necessary 3. Delay in the management of ACL may be of paramount importance as studies have shown that more than half of patients who had ACL injury will develop symptomatic osteoarthritis in the following 10 to 20 years [4].

Conservative management has been associated with poor functional outcomes [5, 6, 7]. Consequently, the significantly better functional outcome of ACLR has become the first-line treatment option for ACL injury [2]. Various procedures have been described ranging from minimally invasive arthroscopic to open procedures [8]. Different autografts used for ACLR include Bone patellar tendon bone graft, quadriceps graft, peroneus longus tendon graft and hamstring graft. Each of them has its pros and cons related to post-reconstruction outcomes. The choice of the graft to get a good clinical outcome may not be that much more important than other aspects like the recreation of the anatomic attachment sites, creation of firm initial fixation, addressing associated injuries, and a structured postoperative rehabilitation program [9].

We are presenting our case series in which we have done ACLR with an autologous hamstring graft.

The basic idea for this project was to increase the awareness regarding timely management of ACL injury and the good to the excellent outcome of this minimally invasive technique.

2. Materials & Methods

This is a retrospective study that included 10 patients who underwent arthroscopic transportal single bundle ACLR using hamstring autograft, between January 2019 to December 2021 in Isra university hospital Hyderabad. Adult patients of either sex with knee instability associated with complete ACL tear were included in the study. Patients with other associated ligamentous injuries, osteoarthritis knee, contralateral knee injury and revision ACL surgery patients were excluded.

In all patients, the autograft was fixed with a Tightrope button on the femoral side while a bio-absorbable interference screw was used in the tibial tunnel for fixation. ACL brace was used postoperatively and patients underwent progressive physiotherapy. Patients were followed routinely and the outcome was recorded with the help of the Lysholm knee scoring questionnaire at 6 months and 12 months post-procedure. Data were analyzed through SPSS.

3. Results

10 patients were included in the study. The mean age of the patients was 28.2 years (22 to 35 years) (Table-1). Nine of our patients (90%) were male while only one patient was female (10%). The right knee was involved in 6 patients (60 %) while the left knee was involved in the remaining 4 patients (40%). Mechanism of injury was sports related in 7 patients (70%), road traffic accident in 2 patients (20 %) and fall in one patient (10 %). 8 patients (8o %) presented with complaints of instability of the knee joint while the remaining 2 patients presented with pain and locking of the knee joint respectively. The average duration between injury to surgical intervention was 12.3 months (6 to 26 months). The outcome score improved significantly at the one-year follow-up (Table-2). The outcome was excellent in 3 patients (60%), good in 6 patients (30%) and fair in one patient (10%).

Table-1 Demographics

Variable	Details
Total number of the patients	10
The mean age of the patients	28.2 years (22 to 35 years).
Gender	Male 9 Female 1
Site involved	Right knee - 6 patients (60 %). Left knee - 4 patients (40 %).
Mechanism of injury	• Sports-related trauma in 7 patients (70%), • Road traffic accident in 2 patients (20 %) • Fall in one patient (10 %)
Presenting complaint	• Instability – 8 patients (8o %) • Pain- one patient (10%) • Locking- one patient (10%)
The average delay between injury to surgery	12.3 months (6 to 26 months)
Outcome at one-year follow-up	• Excellent-3 patients (30%) • Good-6 patients (60%)) • Fair-one patient (10%). • Poor-nil

5. Discussion

Our study shows the outcome of single bundle ACLR with hamstring autograft in 10 patients. The outcome score improved significantly at the one-year follow-up (Table-2). Single-bundle ACLR has been favoured by many sports surgeons as literature has shown no significant difference in functional outcome scores between single-bundle and double-bundle ACLR 10. Furthermore, it has been observed that single-bundle ACLR leads to less postoperative pain as compared to double-bundle ACLR with subsequent relatively easier rehabilitation and patient satisfaction 11. We had the majority of male patients in the study (9 males and one female). Similar male predominance has also been observed in other studies (3, 12). This is assumed to be due to relatively less exposure of females to sports or trauma as compared to the male gender 13. The final functional outcome as analyzed by the Lysholm score was excellent in 3 patients (60%), good in 6 patients (30%) and fair in one patient (10%). Similar excellent to good scores have been observed in other studies as well [3, 14].

One of the main purposes of this paper was to increase awareness regarding satisfactory results of surgical intervention if timely done. Studies have shown

significantly better functional outcomes if ACL reconstruction was performed within 6 months post-injury. [12]

As there is no other hospital which is providing sports medicine interventional service in our city so the patients get little or no education about their injuries and their drastic consequences which leads to delays in treatment. This was also reflected by the average intervention time in our study which is unfortunately 12.3 months (6 to 26 months).

Table-2 Outcome score at final follow-up

Outcome	Score	P Value
before intervention	62.4	<0.05 (Significant)
one year after the intervention	91.7	

Regarding complications, we had one patient who had persistent decreased ROM after ACLR. This patient had his ACLR done 10 months after injury. Preoperatively he had a knee range of motion of 0 to 110 degrees. The patient had persistent restricted knee flexion after surgery and this could not be improved even after physiotherapy. This patient underwent arthroscopic adhesiolysis 6 months post-index surgery and his ROM improved. Limitations of our study were retrospective design and a small sample size.

5. Conclusion

Injury to the anterior cruciate ligament is a critical event for any individual. Its timely management is important not only to return the patient to pre-injury activity level but also to prevent delayed consequences of ACL tear. Our study and the literature review show satisfactory results of arthroscopic reconstruction of ACL. Finally, one should follow the basic principles of the arthroscopic surgical technique of ACLR along with postoperative supervised physiotherapy rehabilitation protocol to get the desired results.

CONFLICTS OF INTEREST- None

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Potential competing interests: None to report

Contributions:

M.S.K, W.A - Conception of study
M.S.K, W.A – Experimentation/Study conduction
M.S.K, W.A -Analysis/Interpretation/Discussion
M.S.K, W.A - Manuscript Writing
M.S.K, W.A - Critical Review
M.S.K, W.A - Facilitation and Material analysis

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