

## Functional outcome of arthroscopic ACL reconstruction using hamstring autograft using IKDC score

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### Abstract

The Anterior Cruciate ligament (ACL) along with other ligaments, capsule is the primary stabilizer of the knee and prevents the knee against anterior translation of the tibia over the femur. Anterior cruciate ligament deficiency affects Knee stability, resulting in giving way symptoms in daily and sports activities with increased the risk of intra-articular damage. To prevent the deterioration of the existing lesions ACL reconstruction is necessary. However there is a controversy in literature regarding ACL reconstruction. The purpose of this study is to evaluate the functional outcome of Arthroscopic ACL reconstruction using hamstring tendon autograft in the surgical management of ACL injury using IKDC score.

**Keywords:** ACL, Hamstring, Reconstruction, IKDC, RTA.

### Introduction

The Anterior Cruciate ligament (ACL) along with other ligaments, capsule is the primary stabilizer of the knee and prevents the knee against anterior translation of the tibia over the femur and is important in counteracting rotation

and valgus stress. ACL tears have been termed as the 'Beginning of the end of the knee'. The goal of treatment of an anterior cruciate ligament deficient knee is to provide a stable knee with ACL reconstruction surgery. Arthroscopic reconstruction of the injured ACL has become the “gold standard”. However, there is no consensus to what the best graft option is to replace the injured graft. The hamstring graft is increasingly used nowadays for the following reasons:

- Advancements made in soft tissue graft fixation techniques
- Increased incidence of anterior knee pain with bone patellar tendon bone graft

The purpose of this study is to evaluate the functional outcome of Arthroscopic ACL reconstruction using hamstring tendon autograft in the surgical management of ACL injury using IKDC score.

### Materials and Method

This prospective longitudinal study of 30 patients presented in Department of Orthopaedics, Gandhi Medical College, Bhopal from October 2018 to April 2020 with

complaint of knee pain or stability who were diagnosed to have ACL tear. Patients who satisfied the inclusion criteria (20-50 yrs old, both sexes with clinical, radiological or arthroscopic evidence of ACL tear with no previous history of surgery in the same knee) were included in the study. Patients having multiple bilateral ACL tear, associated lower limb fractures or multi ligamentous injuries were excluded. The clinical assessment involved detailed history with clinical examination including clinical tests like Lachmann's test, Anterior drawer test, McMurray's test, Pivot shift test. Patient workup included X-rays of the involved knee joint-anteroposterior and lateral views, MRI imaging evaluation and IKDC 2000 knee scoring along with routine investigations. Consent for surgery was obtained after explaining the risk benefit ratio. After obtaining pre-anesthetic clearance, surgical procedure was carried out using standard portals and techniques under tourniquet. Total 30 patients were operated with hamstring auto graft fixed with interference screw and endo-button.



Figure1: Hamstring ACL Graft Harvesting

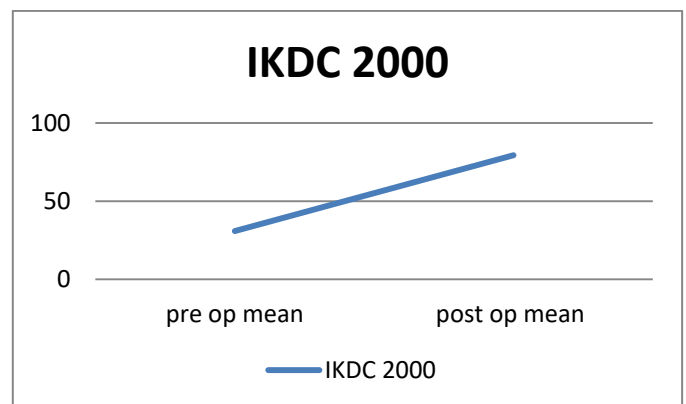
Compression bandage and hinged knee brace was applied to all cases during the immediate postoperative period and was continued till two weeks post-op. Wound inspection and check dress was done on the 3rd postoperative day. Isometric quadriceps and ankle mobilization exercises and

knee ROM exercises were started on 1st post-op day. Weight bearing was allowed from 2<sup>nd</sup> day as tolerated with crutches and Full weight bearing was achieved by 2 weeks. Passive ROM exercise was started from 3<sup>rd</sup> postop day and active ROM around 90 degree was targeted by 3 weeks. By 3<sup>rd</sup> week, Isotonic closed chain exercises were started and progressed to Open chain exercises using free weights after 2 weeks. Proprioceptive exercises and Cardiovascular fitness were begin after 8 weeks Postoperatively, functional activities climbing were allowed after 3months. Sports activities were allowed after 6 to 9 months depending on the recovery of the patient. Patients were followed at regular intervals- 3months, 6months and 12 months. Patients were assessed at every visit with clinical tests and IKDC 2000 score. All the collected data were entered into Microsoft Excel and statistical analysis was done using SPSS software. The monitored and calculated parameters were analyzed using paired t-test for comparison between pre-operative and post-operative outcomes with p value of <0.05 considered significant.

### Results and Discussion

Following observations are based upon the prospective observational study conducted at Department of Orthopaedics, Gandhi Medical College Bhopal from October 2018 to April 2020 comprising 30 cases.

Graph 1: Functional evaluation



**Mean value of IKDC 2000 score increased from 30.9 to 79.4**

Student's t test was applied on pre and post IKDC Score. The t test statics was  $t = -24.2$  . 95% CI (-50.5 to -44.2) @ 29 degrees of freedom with p value  $<0.005$  which indicates that there is statistically significant difference between the means.

Due to the ever-increasing RTAs and increased participation in sporting activities, there is an increase in incidence of ligament injuries of the knee, most common being the ACL. Surgical reconstruction of ACL along with Accelerated rehabilitation programs has become the standard of care to restore its function. Although there is a wide variety of graft choices are available for ACL reconstruction, Hamstring autografts have increasingly become more popular over the past decade.

In the present study, Functional evaluation was performed with IKDC 2000 Score which are designed specially for evaluation for injuries involving knee ligament. The mean pre-operative IKDC score in this study was 30.9 whereas the post-operative score was 79.4. There was significant improvement in post-operative IKDC score when compared with preoperative score.

Table : IKDC Knee Score

Study	Pre- op IKDC Score	Post- op IKDC Score
Kumar et al.	55.63	89.38
Prasad et al.	42.45	94.33
Aparajit et al	50.5	86.03
Present Study	50.86	87.66

The mean pre-operative IKDC score in the study by Kumar et al. was 55.63, Prasad et al. was 42.45 and Aparajit et al. was 50.5 whereas the post-operative scores

were 89.38, 94.33 and 86.03, respectively. From the above data, it can be seen that the post-op IKDC score in this study was comparable with the scores from other studies.

**Conclusion**

Present prospective study was conducted in Department of Orthopaedics , Gandhi Medical College, Bhopal from October 2018 to April 2020 comprising 30 patients to clinically evaluate the results of arthroscopic anterior cruciate ligament reconstruction using hamstring tendon graft. Preoperatively, Lachman Test, Anterior Drawer Test and Pivot Shift Test were positive in all the patients (100%). Postoperatively, 80%, 83.3% and 70% patients were found to have negative tests respectively. Functional evaluation was done using IKDC 2000 Score which was found to be improved significantly as Mean IKDC 2000 score increased from 30.9 (SD-11.66) to 79.4 (SD-7.11) on final follow-up which statistically significant (p value  $<0.005$ ). Hence it is concluded that arthroscopic ACL reconstruction using Hamstring tendon graft is a safe and effective method of ACL reconstruction especially in young athletes and high demand individuals. It not only significantly increases the stability of the knee but also improves functional outcome of injured knee with early return to sports. Limitations of this study are - Small sample size, Short duration of follow-up and Unavailability of KT arthrometer. In consequence of above mentioned reasons, studies of large sample size, longer duration follow up with KT arthrometer based objective evaluation are required in future to assess the outcome of this procedure and to see persistence of improved knee score and function with a high level of evidence.

**Abbreviations**

ACL- Anterior Cruciate Ligament, RTA-Road Traffic Accident, SD- Standard Deviation, ROM- Range of

Motion, IKDC- International Knee Documentation Committee.

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