



FUNCTIONAL OUTCOME OF ARTHROSCOPIC ACL RECONSTRUCTION WITH HAMSTRING GRAFT

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ABSTRACT

Background: The most common joint to be injured in our body is knee joint, and the commonest ligament to be injured is anterior cruciate ligament in the knee. Etiology includes road traffic accidents and sport injuries. The ACL, along with other ligaments, the capsule are the stabilizers of the knee and prevents anterior translation, and limits valgus and rotational stress. The articular cartilage injuries in acute ACL tears constitutes from 16 – 46%, and in chronic tears, the incidence increases further. For prevention of further worsening of the existing lesions and also to prevent formation of new lesions, stability of the knee should be achieved. The present study is to assess the functional outcome of arthroscopic anterior cruciate ligament reconstruction using hamstring tendon (gracilis and semitendinosus) autograft in patients with ACL tears.

Methods: Study design: Hospital Based Observational study.

Study period: September 2019 to August 2021.

Sample size: 30

30 consecutive patients who underwent arthroscopic ACL reconstructions with hamstring graft were taken for this study.

Results: Out of these, 27 patients were male and 3 were female. Right side affected in 18 patients and left side in 12 patients.

The most common mechanism of the injury was sports activity in 17 patients, RTA injuries in 10 patients and other job related injuries in 3 patients. Isolated ACL tears in thirteen patients in our study and rest had associated injuries to menisci in same knee. Better postoperative functional scores are seen with patients with isolated ACL injuries compared to those patients with associated injuries of the knee like meniscal tears.

Observations include anterior drawer test was negative in 83.33% of patients at 3 months, 86.67% of patients at 6 months and at 1 year 96.15% of patients had a negative anterior drawer test. Full range of motion attained in 86.67% of patients at 3 months, 93.33% of patients at 6 months and at 1 year 96.15% of patients. Pivot shift test was negative postoperatively for all the patients at any follow-up. Postoperatively at 3 months 25 (83.33%) patients had 5/5 quadriceps power (MRC grading) 92.3% of them had 5/5 power at latest follow up. Complications include Superficial infection and Deep infection in our study.

Conclusion: Anterior cruciate ligament tears are most common at a mean age of 28 years with preponderance to male gender. The most common mechanism of the injury was sports activity. Isolated ACL injury is more common than along with associated meniscal injuries. Anatomic single bundle reconstruction with quadrupled hamstring graft gives good functional results. Hamstring graft fixation with endobutton and interference screw gives better functional outcome.

KEYWORDS : ACL injury; Hamstring graft; Arthroscopic reconstruction

INTRODUCTION

The most common joint to be injured in our body is knee joint, and the commonest ligament to be injured is anterior cruciate ligament in the knee. Following an ACL injury knee instability, pain, and a restricted function occur. Though conservative management with intensive physiotherapy, bracing, and lifestyle modification can be tried in sedentary patients with less anticipated knee function, in athletes, high demand individuals, and symptomatic young active individuals, ACL reconstruction is essential. ACL injuries with concomitant meniscal injuries should be essentially treated as early as possible to prevent secondary osteoarthritis of the knee joint.

The articular cartilage of the knee joint may be injured in acute ACL tears in 16 – 46% of cases, and in chronic tears, it is even more incidental. The deterioration of the existing lesions and the occurrence of new lesions can be prevented by providing a stable knee.

Arthroscopic reconstruction of the ACL has become the gold standard. Open reconstruction of ACL, which was done earlier, is not preferred due to increased post-op pain, stiffness, and a lengthy rehabilitation with increased morbidity. The most commonly used grafts are bone patellar tendon bone graft and hamstring graft.

Advantages of the hamstring graft:

- Advancements made in soft tissue graft fixation techniques
- absence of anterior knee pain with bone patellar tendon bone graft
- Anterior midline scar is not desirable as it is painful.
- The future incision for replacement arthroplasty will not be affected.

Aim And Objectives

- To assess the functional outcome of arthroscopic single-bundle anterior cruciate ligament reconstruction using hamstring tendon (gracilis and semitendinosus) autograft in individuals with ACL injuries.
- To compare our results with the available literature

Material And Methods

Between September 2019 to August 2021, 30 consecutive patients who underwent arthroscopic ACL reconstructions with hamstring graft in the Department of Orthopaedics, King George Hospital, Visakhapatnam were the material in our study.

No. of Cases : 30 cases

Duration of study : September 2019 to August 2021

Inclusion Criteria:

1. Clinical/MRI evidence of anterior cruciate ligament injury
2. Patients between age 18 to 40.
3. Associated with meniscal tears
4. No previous surgeries in the knee.

Exclusion Criteria:

1. skeletally immature patients.
2. Associated injuries of tibial or femoral condyles.
3. Multiligamentous knee injuries
4. osteoarthritis of knee.
5. Revision ACL surgery.

Operative procedure:

The steps include creation of one tibial and one femoral tunnel at native

ACL tibial and femoral attachment sites respectively. The femoral tunnel was made using anteromedial portal. The graft was fixed at the tibial side using bioscrew or titanium interference screw and at the femoral side using bioscrew or titanium interference screw or tightropes and endobutton. Diagnostic arthroscopy is done, a 3 cm oblique skin incision is made starting 5 cm below the medial joint line and 2 cm medial to the tibial tuberosity. It is planned to do the graft harvest and tibial tunnel drilling through the same incision. The superior border of the pes anserinus is identified using the fingers. With the help of right angled artery forceps, the gracilis and then the semitendinosus are hooked out. The tendon ends were tied with double loop knot to aid in traction. The knee is placed in 90 degrees of flexion and proximal dissection of the tendons were done using blunt dissection by fingers till the musculotendinous junction thereby releasing adhesions and accessory bands, while continuous traction was being applied through the threads. The distal end of the tendon is freed with the scissors. Then a tendon stripper is advanced over the tendon in line with it maintaining firm, steady and gentle pressure and at the same time applying traction by holding the threads. The harvested graft is then placed on Graftmaster board. The tendon ends are trimmed to achieve uniform size. A whipstitch is placed at both ends of the tendons. Around 3-4 cm of both the ends of the tendon were stitched together. The two tendons are looped over a umbilical tape. The composite graft is then passed through the graft sizer. The diameter of the tunnel to be made is equal to the smallest sizing sleeve through which the quadrupled graft passed with minimum friction. In our study on Arthroscopic Anterior Cruciate Ligament reconstruction, a total of 30 cases were operated and followed up at regular interval. Minimum follow up period was 6 months, and maximum follow up period was 24 months, the average being 14 months.

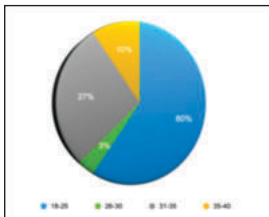
RESULTS:

Age Distribution

Majority of patients, i.e. 18 (60%) patients in our study were in the age group of 18-25 years, 1(3.3%) was in the age group of 26-30 years, 8(26.7%) were in the age group of 31-35 and 03(10%) were in the age group of 36-40.

Table No. 1 : Age Group (n=30)

AGE GROUP (YRS)	NO. OF PATIENTS	PERCENTAGE
18-25	18	60%
26-30	1	3.3%
31-35	8	26.7%
36-40	3	10%



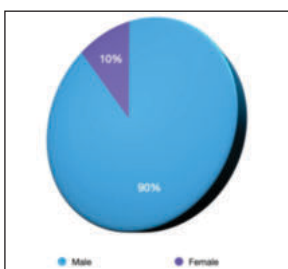
Graph 1: Pie Diagram showing the Age Groups

Sex Distribution

Male predominance was found in our study. 27 (90%) patients were males, and 3(10%) were female patients. This probably was because of the more involvement of males in sports and road traffic accidents.

Table No. 2: Sex Distribution (n=30)

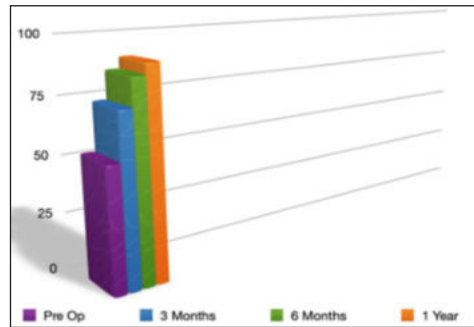
SEX	NO. OF PATIENTS	PERCENTAGE
Male	27	90%
Female	3	10%



Graph 2: Pie Diagram showing the Sex Distribution

Table No. 3 : Average Ikdc Score:

DURATION	AVERAGE IKDC SCORE
Pre op (n=30)	53.47
3 months (n=30)	74.03
6 months (n=30)	86
1 year (n=26)	90.76



Graph 6 : BAR diagram showing AVERAGE IKDC SCORES:

Range Of Motion Of Operated Knee

In our study of 30 patients, at 3 months follow up 27 (90%) patients had normal range of movements of the operated knee, at 6 months follow up 28 (93.33%) patients had equal range of movement compared to normal contra-lateral side, at 1 year follow up 25 (96.15%) patients had equal range of motion compared to contra-lateral side. 1 patient had a deep infection with loss of range of motion.

Table No. 4 : Complications:

COMPLICATIONS	NO. OF CASES	TREATMENT GIVEN
Deep infection	1	Joint Lavage, I.V Antibiotics, Rehabilitation
Superficial infection	2	Intravenous antibiotics

In our study, there was concurrent meniscal injury in 57% of patients. Thirteen patients in our study had isolated ACL injury. Eleven patients had injury to the medial meniscus whereas one patient had injury to the lateral meniscus alone. Three patients had injury to both the medial and lateral meniscus. Medial meniscus was the commonest to be injured which was in accordance with other studies.

Among the patients with meniscal injuries, three patients were treated by partial meniscectomy and in one patient meniscal repair was done. The rest of the patients were managed conservatively. The functional outcome of patients with isolated ACL injury was comparable with that of the patients with associated meniscal injuries.

CONCLUSION

Anterior cruciate ligament tears are most common in males at a mean age of 28 years. The most common mechanism of the injury was activity of sports. Isolated ACL injury is more common than along with associated meniscal injuries. In young active adults, anatomic single bundle reconstruction with quadrupled hamstring graft gives good functional results. The absence of patellofemoral pain with the use of hamstring graft makes it a more desirable option for patients with patellofemoral cartilage disorders or those with chronic patellofemoral pain. Hamstring graft fixation with endobutton and interference screw gives good functional outcome. Arthroscopic anterior cruciate ligament reconstruction with hamstring graft is a splendid treatment option for anterior cruciate ligament deficient knees.

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